



Appendix C

RF Test Data for 2.4G WIFI (Conducted Measurement)

Product Name: 37 inch Soundbar with Amazon Alexa

Test Model: CAW-70940

Environmental Conditions

Temperature:	22.5° C
Relative Humidity:	53.3%
ATM Pressure:	100.0 kPa
Test Engineer:	Kay Hu
Supervised by:	Li Huan



C.1 6dB Bandwidth

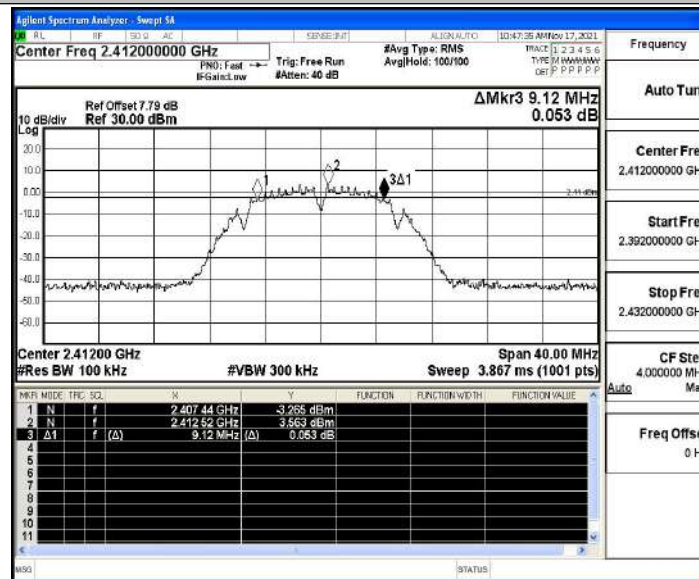
Test Result

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	9.160	2432.880	2442.040	0.5	PASS
		2462	9.600	2456.920	2466.520	0.5	PASS
11G	Ant1	2412	16.440	2403.800	2420.240	0.5	PASS
		2437	16.200	2429.040	2445.240	0.5	PASS
		2462	15.800	2453.800	2469.600	0.5	PASS
11N20SISO	Ant1	2412	17.680	2403.160	2420.840	0.5	PASS
		2437	17.040	2428.800	2445.840	0.5	PASS
		2462	17.280	2453.160	2470.440	0.5	PASS
11N40SISO	Ant1	2422	35.920	2404.320	2440.240	0.5	PASS
		2437	32.880	2421.960	2454.840	0.5	PASS
		2452	35.280	2434.320	2469.600	0.5	PASS

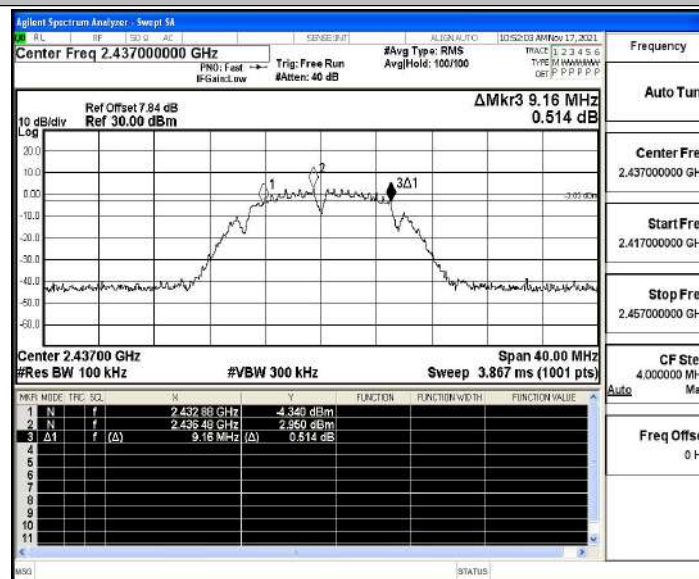


Test Graphs

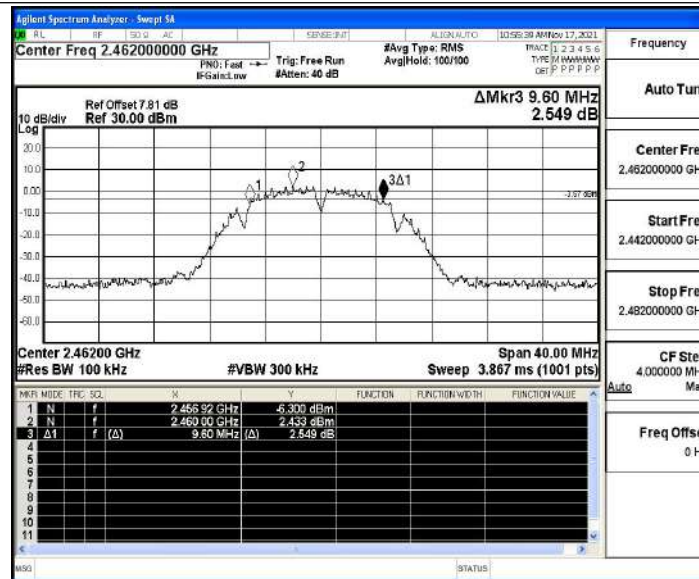
11B_Ant1_2412



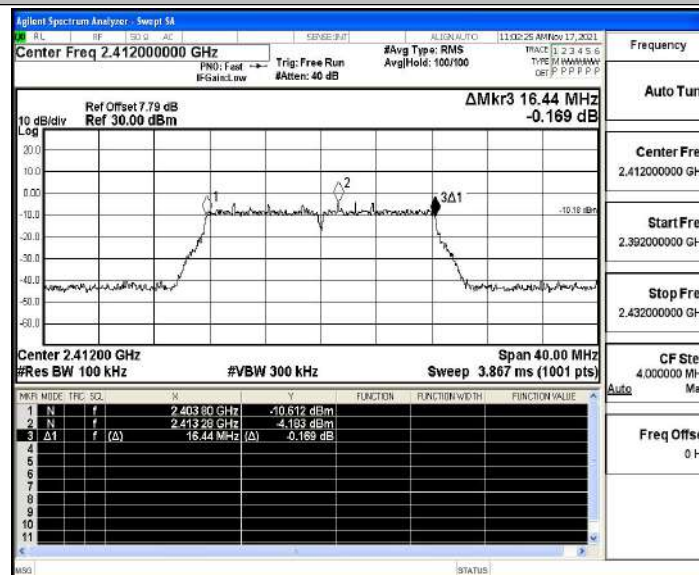
11B_Ant1_2437



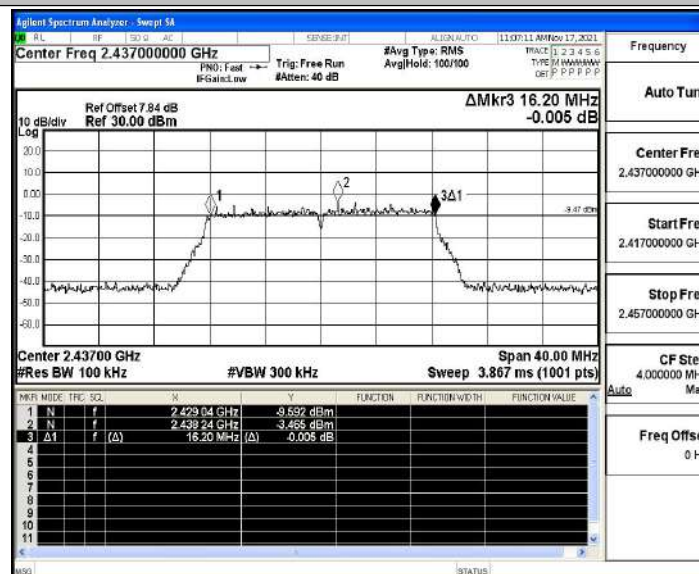
11B_Ant1_2462



11G_Ant1_2412

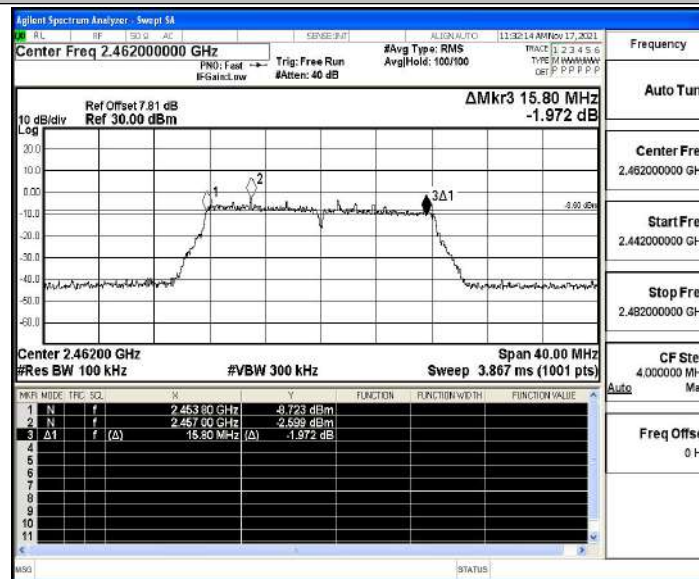


11G_Ant1_2437

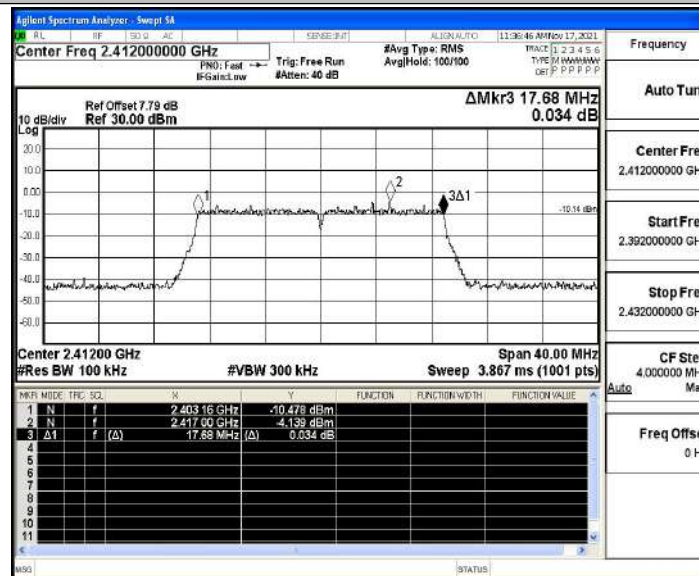




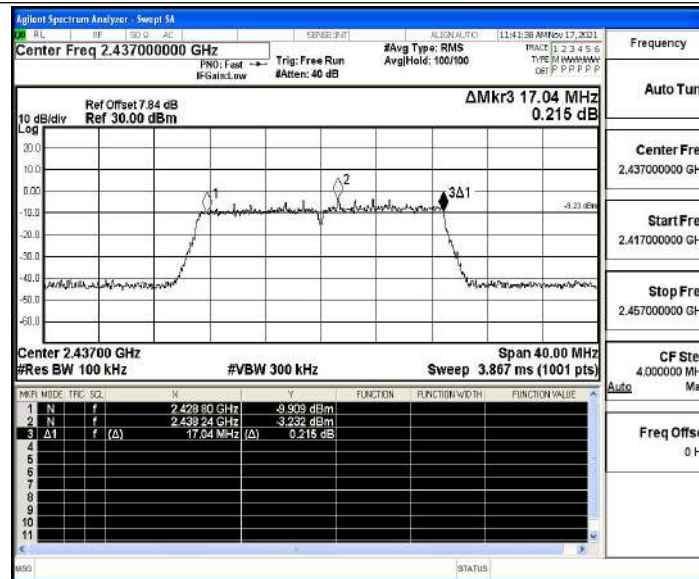
11G_Ant1_2462



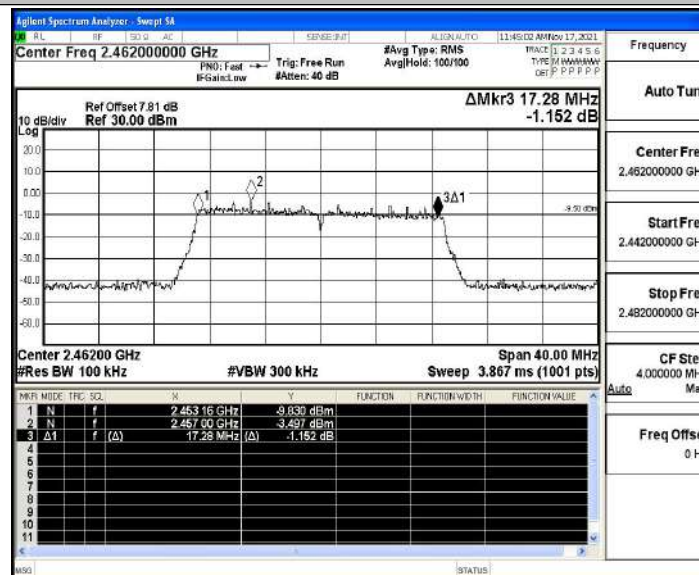
11N20SISO_Ant1_2412



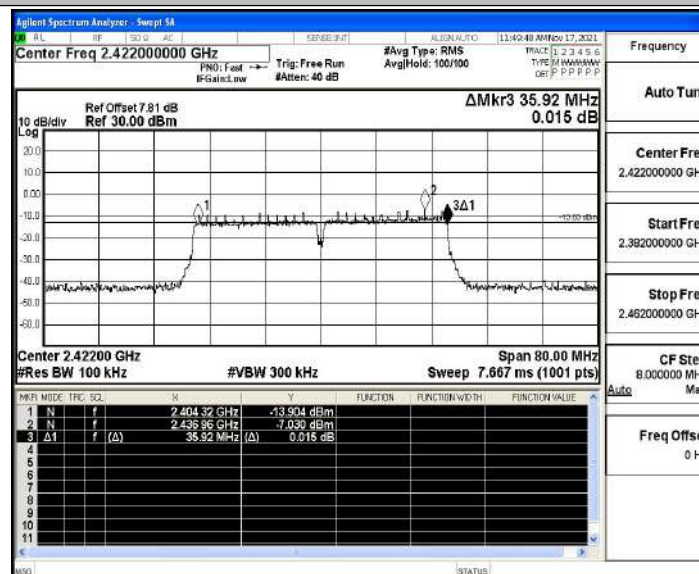
11N20SISO_Ant1_2437



11N20SISO_Ant1_2462

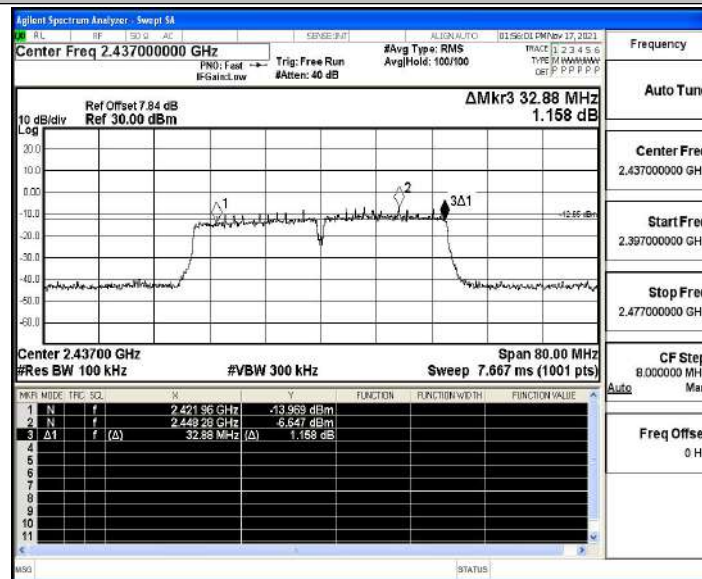


11N40SISO_Ant1_2422

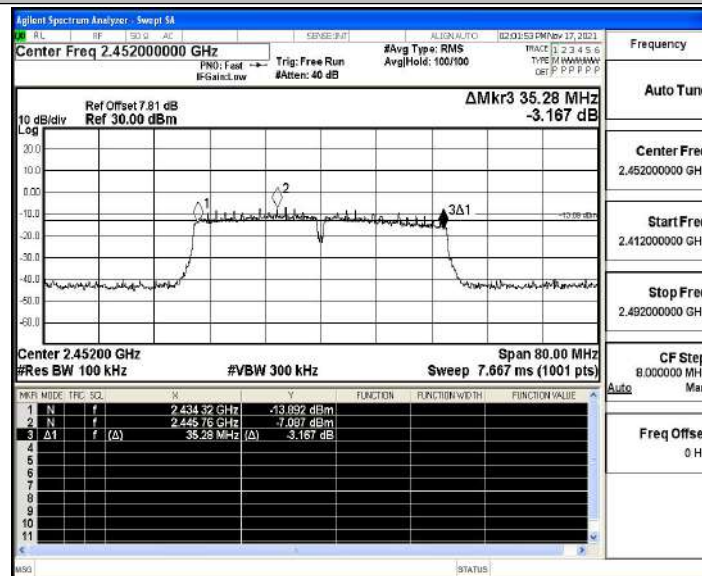




11N40SISO_Ant1_2437



11N40SISO_Ant1_2452





C.2 Maximum conducted output power

Test Result

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	2412	15.26	≤30	PASS
		2437	15.08	≤30	PASS
		2462	14.64	≤30	PASS
11G	Ant1	2412	14.40	≤30	PASS
		2437	14.71	≤30	PASS
		2462	15.20	≤30	PASS
11N20SISO	Ant1	2412	14.72	≤30	PASS
		2437	14.78	≤30	PASS
		2462	14.36	≤30	PASS
11N40SISO	Ant1	2422	13.65	≤30	PASS
		2437	13.69	≤30	PASS
		2452	13.51	≤30	PASS

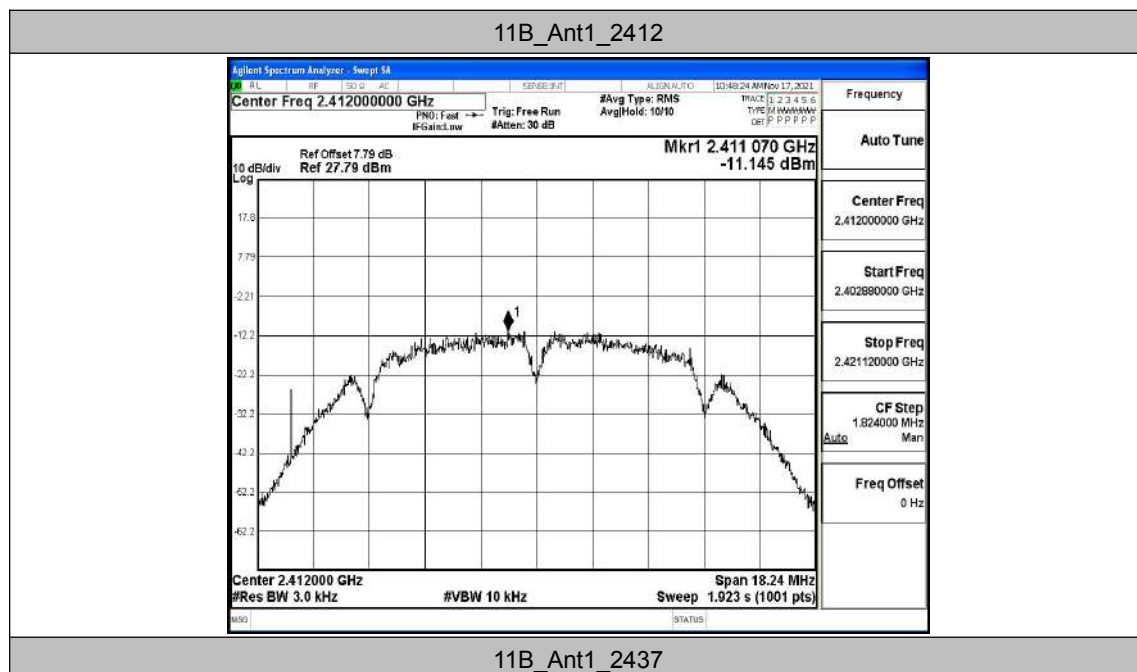


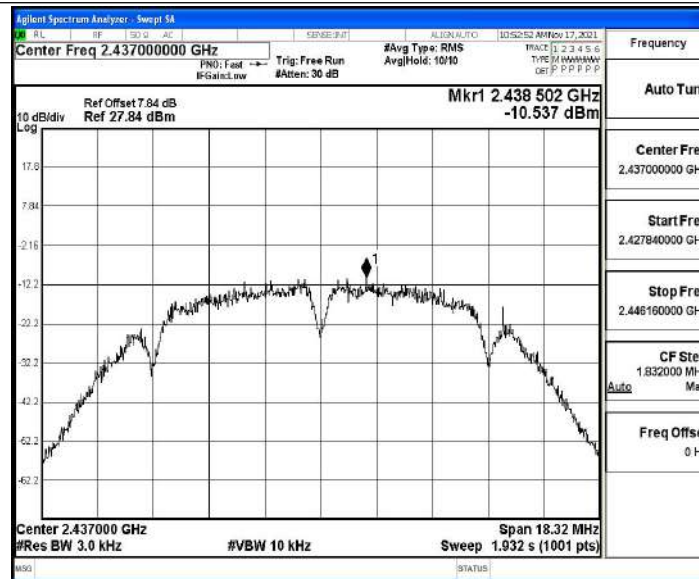
C.3 Maximum power spectral density

Test Result

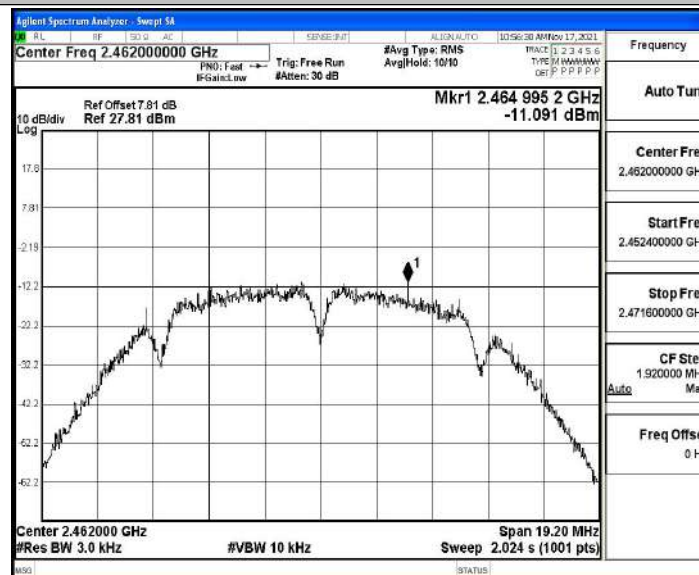
TestMode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-11.15	≤8	PASS
		2437	-10.54	≤8	PASS
		2462	-11.09	≤8	PASS
11G	Ant1	2412	-17.57	≤8	PASS
		2437	-17.37	≤8	PASS
		2462	-16.82	≤8	PASS
11N20SISO	Ant1	2412	-18.11	≤8	PASS
		2437	-17.6	≤8	PASS
		2462	-17.49	≤8	PASS
11N40SISO	Ant1	2422	-20.92	≤8	PASS
		2437	-20.62	≤8	PASS
		2452	-21.03	≤8	PASS

Test Graphs

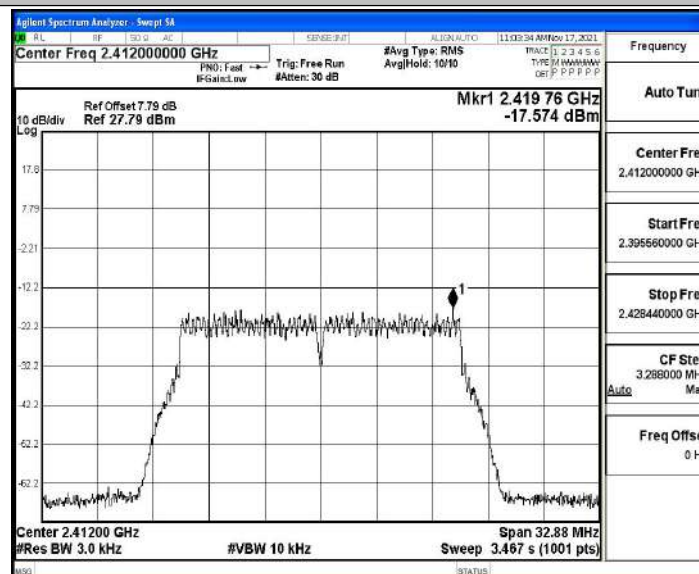




11B_Ant1_2462

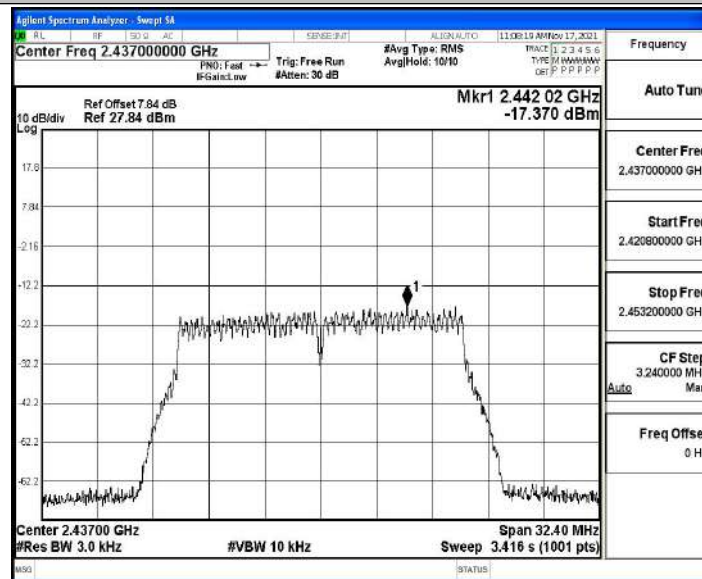


11G_Ant1_2412

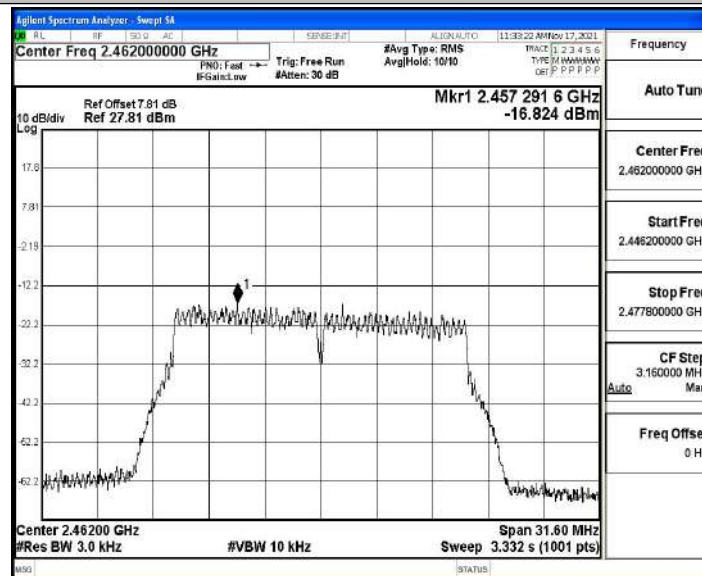




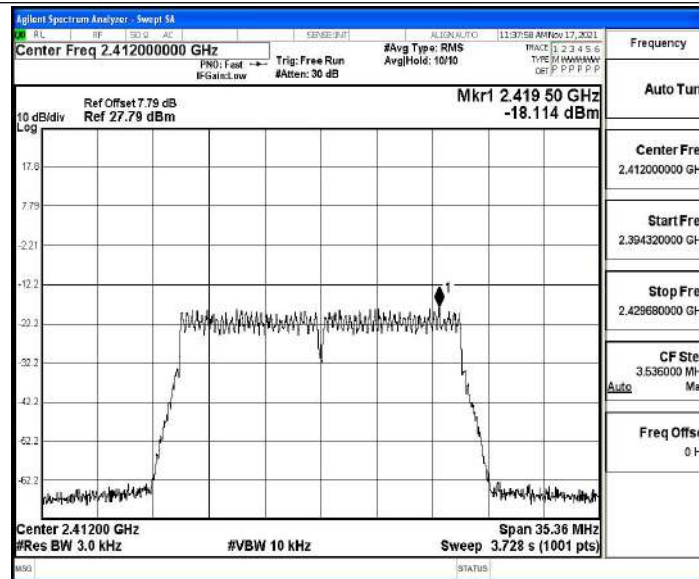
11G_Ant1_2437



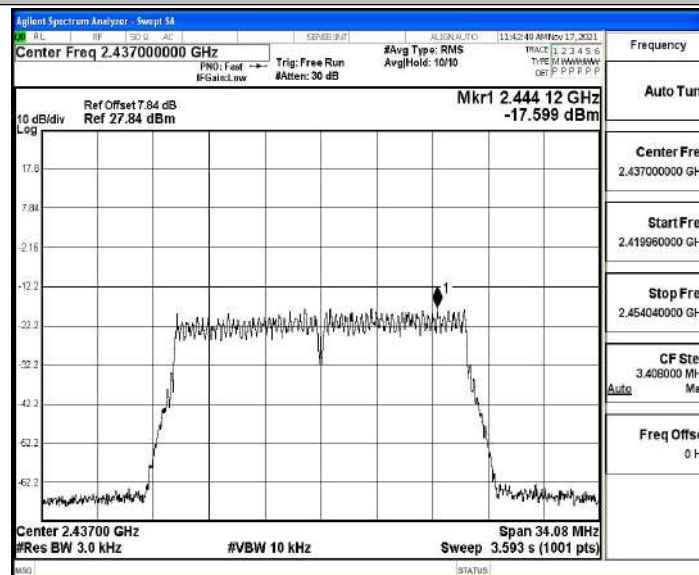
11G_Ant1_2462



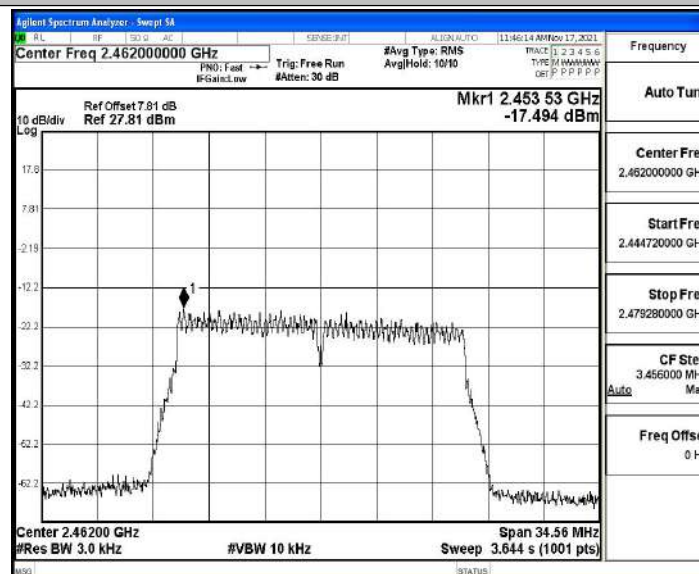
11N20SISO_Ant1_2412



11N20SISO_Ant1_2437

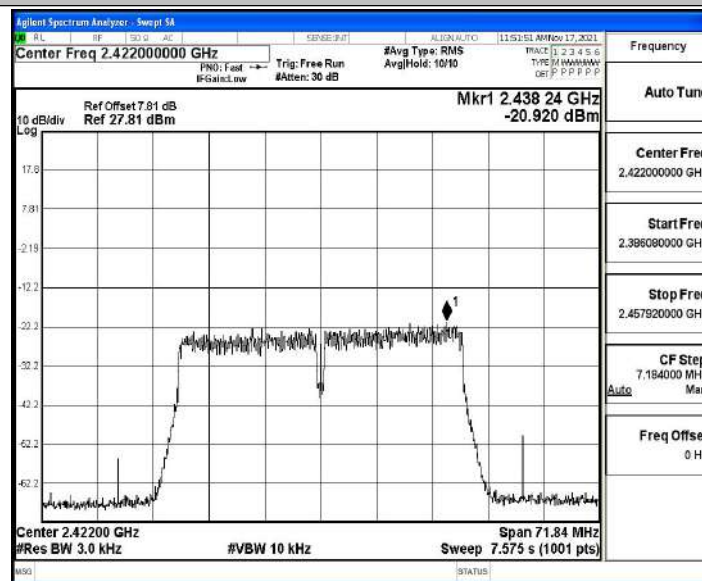


11N20SISO_Ant1_2462

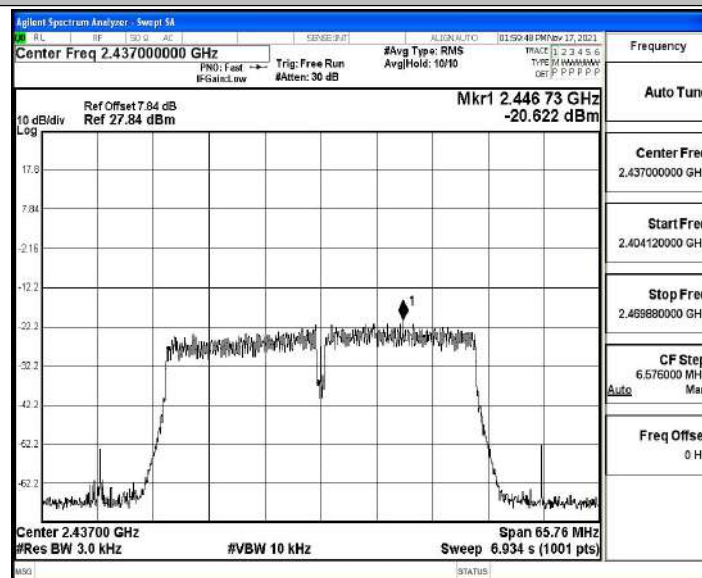




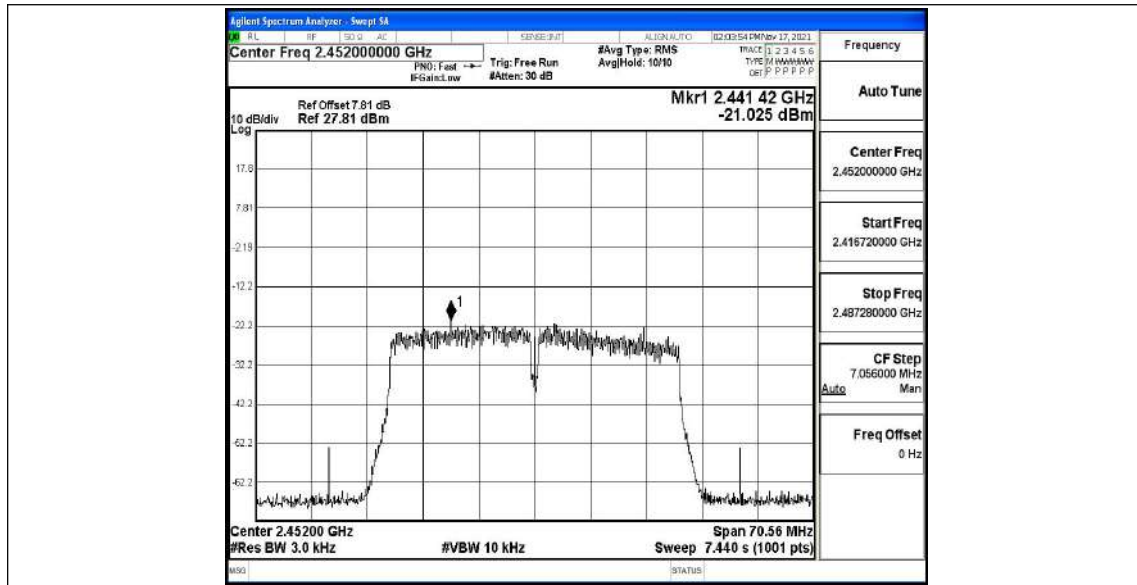
11N40SISO_Ant1_2422



11N40SISO_Ant1_2437



11N40SISO_Ant1_2452





C.4 Band edge measurements

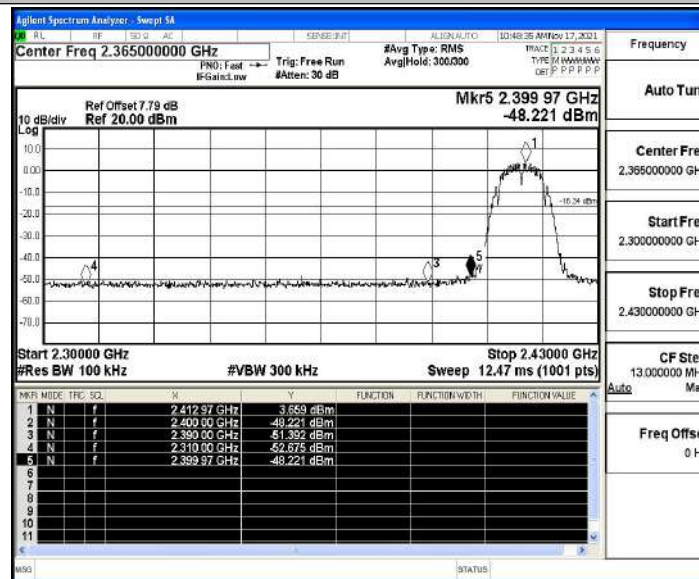
Test Result

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	3.66	-48.22	≤ -16.34	PASS
		High	2462	3.06	-45.82	≤ -16.94	PASS
11G	Ant1	Low	2412	-3.98	-47.81	≤ -23.98	PASS
		High	2462	-2.40	-45.44	≤ -22.4	PASS
11N20SISO	Ant1	Low	2412	-3.60	-45.24	≤ -23.6	PASS
		High	2462	-3.08	-44.11	≤ -23.08	PASS
11N40SISO	Ant1	Low	2422	-8.00	-48.76	≤ -28	PASS
		High	2452	-7.03	-42.09	≤ -27.03	PASS

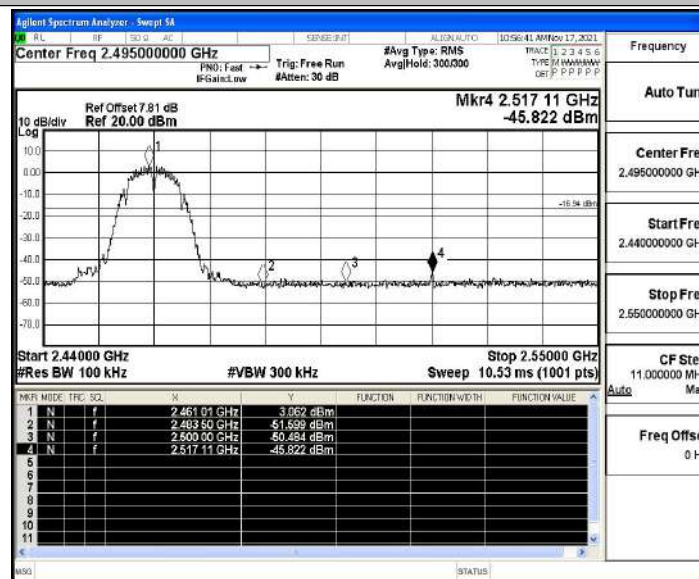


Test Graphs

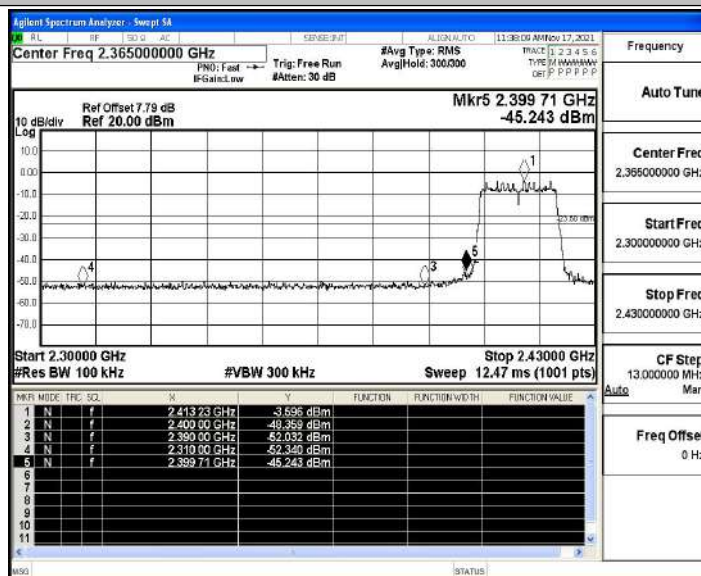
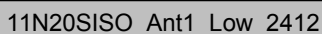
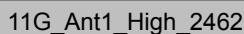
11B_Ant1_Low_2412



11B_Ant1_High_2462

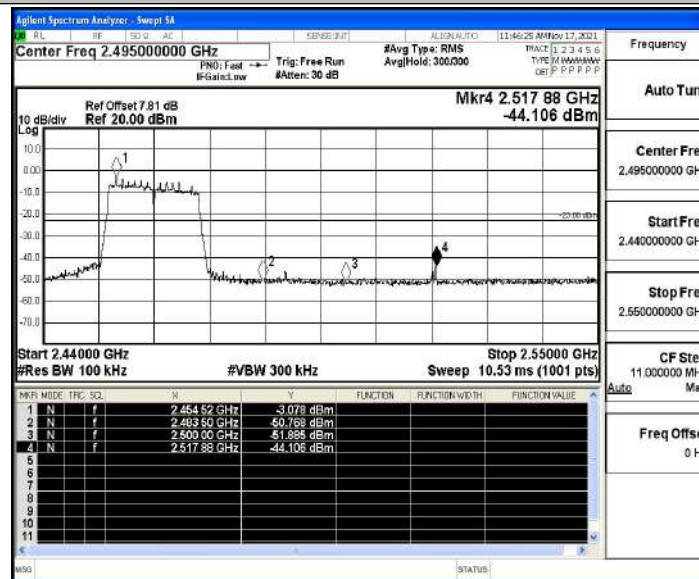


11G_Ant1_Low_2412

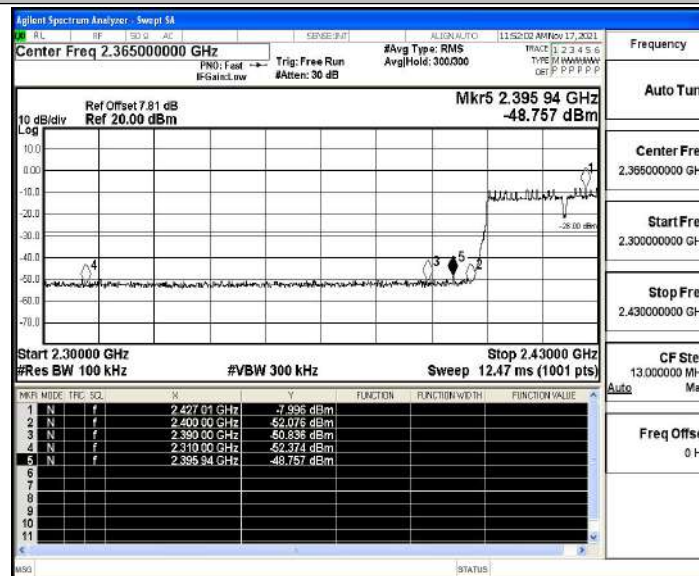




11N20SISO_Ant1_High_2462



11N40SISO_Ant1_Low_2422



11N40SISO_Ant1_High_2452



C.5 Conducted Spurious Emission

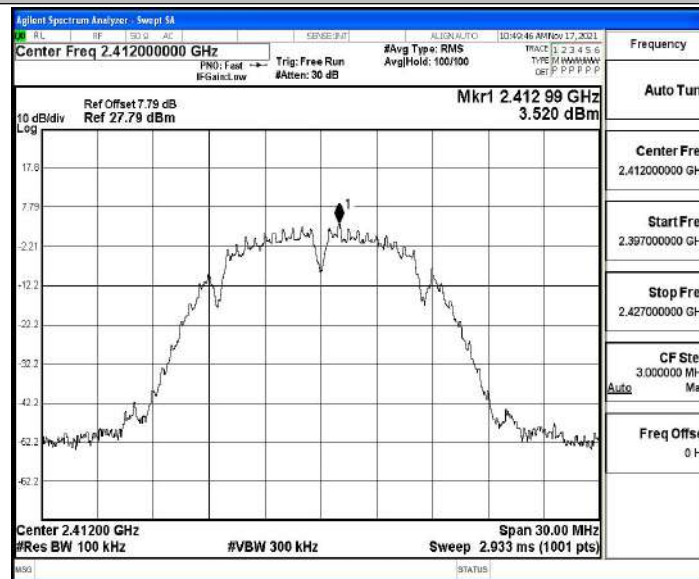
Test Result

TestMode	Antenna	Channel	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	Reference	3.52	3.52	---	PASS
			30~1000	3.52	-61.23	≤-16.48	PASS
			1000~26500	3.52	-46.21	≤-16.48	PASS
		2437	Reference	3.57	3.57	---	PASS
			30~1000	3.57	-61.2	≤-16.43	PASS
			1000~26500	3.57	-47.08	≤-16.43	PASS
		2462	Reference	3.11	3.11	---	PASS
			30~1000	3.11	-60.94	≤-16.89	PASS
			1000~26500	3.11	-47.16	≤-16.89	PASS
11G	Ant1	2412	Reference	-4.24	-4.24	---	PASS
			30~1000	-4.24	-61.28	≤-24.24	PASS
			1000~26500	-4.24	-47.45	≤-24.24	PASS
		2437	Reference	-3.67	-3.67	---	PASS
			30~1000	-3.67	-61.89	≤-23.67	PASS
			1000~26500	-3.67	-46.79	≤-23.67	PASS
		2462	Reference	-4.92	-4.92	---	PASS
			30~1000	-4.92	-61.45	≤-24.92	PASS
			1000~26500	-4.92	-47.13	≤-24.92	PASS
11N20SISO	Ant1	2412	Reference	-3.88	-3.88	---	PASS
			30~1000	-3.88	-61.39	≤-23.88	PASS
			1000~26500	-3.88	-46.97	≤-23.88	PASS
		2437	Reference	-3.46	-3.46	---	PASS
			30~1000	-3.46	-61.56	≤-23.46	PASS
			1000~26500	-3.46	-46.95	≤-23.46	PASS
		2462	Reference	-3.07	-3.07	---	PASS
			30~1000	-3.07	-61.7	≤-23.07	PASS
			1000~26500	-3.07	-47.19	≤-23.07	PASS
11N40SISO	Ant1	2422	Reference	-6.99	-6.99	---	PASS
			30~1000	-6.99	-60.17	≤-26.99	PASS
			1000~26500	-6.99	-47.38	≤-26.99	PASS
		2437	Reference	-7.29	-7.29	---	PASS
			30~1000	-7.29	-61.14	≤-27.29	PASS
			1000~26500	-7.29	-47.68	≤-27.29	PASS
		2452	Reference	-7.25	-7.25	---	PASS
			30~1000	-7.25	-61.35	≤-27.25	PASS
			1000~26500	-7.25	-47.26	≤-27.25	PASS

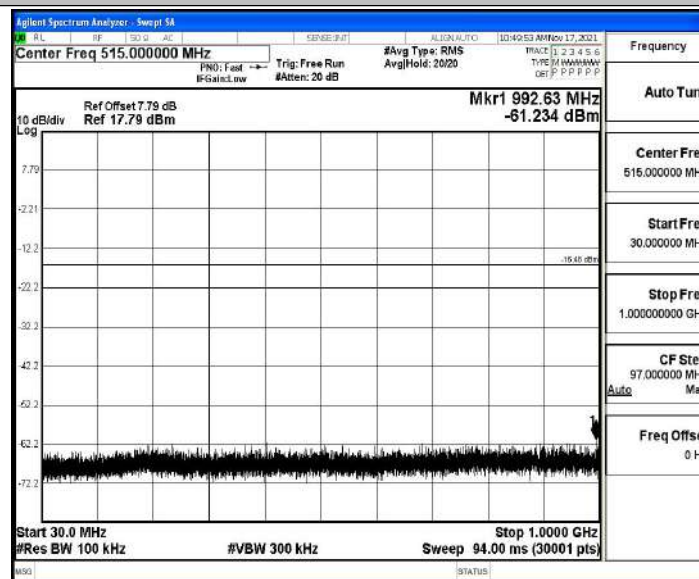


Test Graphs

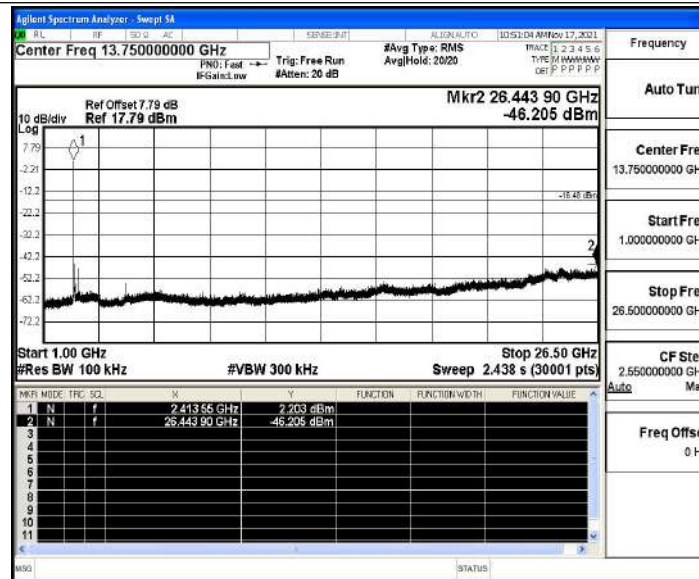
11B_Ant1_2412_0~Reference



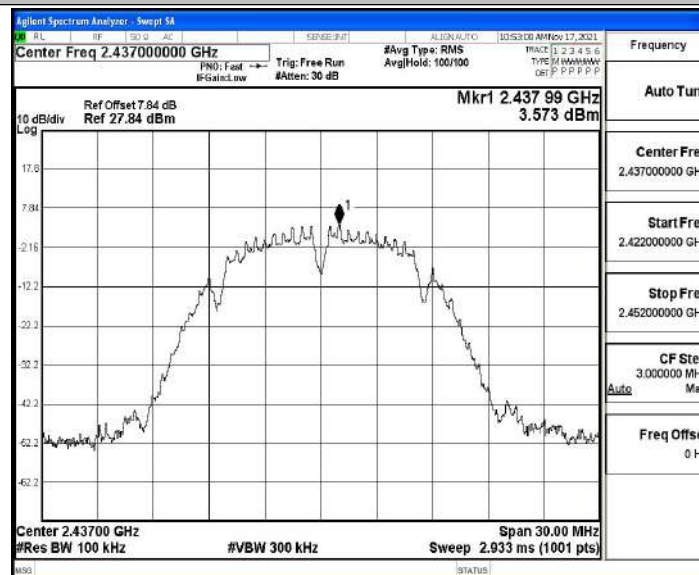
11B_Ant1_2412_30~1000



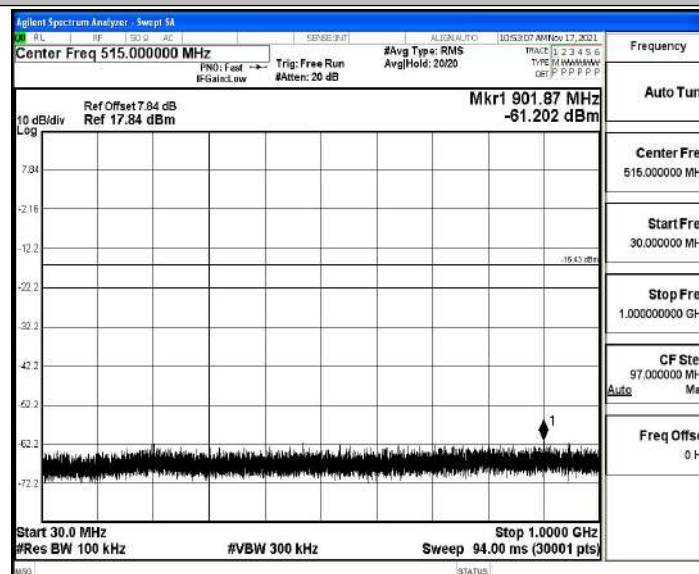
11B_Ant1_2412_1000~26500



11B_Ant1_2437_0~Reference

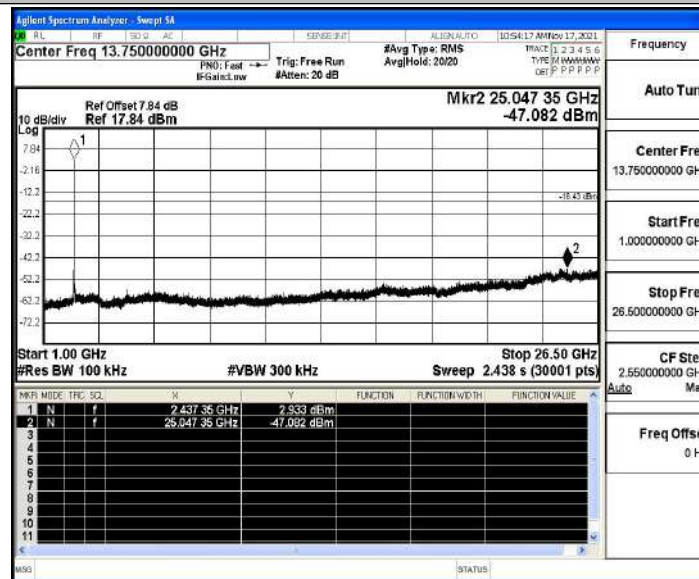


11B_Ant1_2437_30~1000

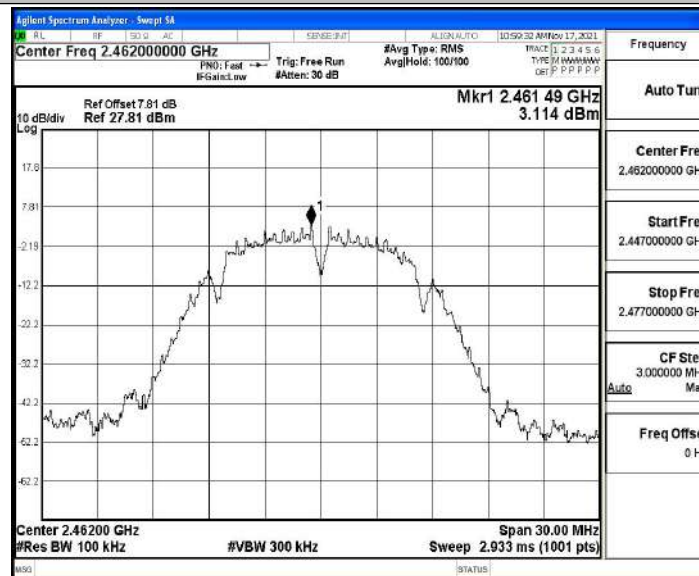




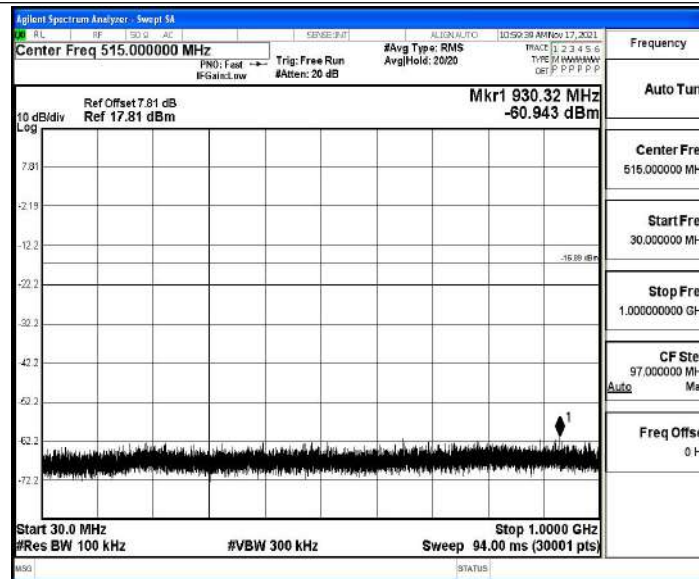
11B_Ant1_2437_1000~26500



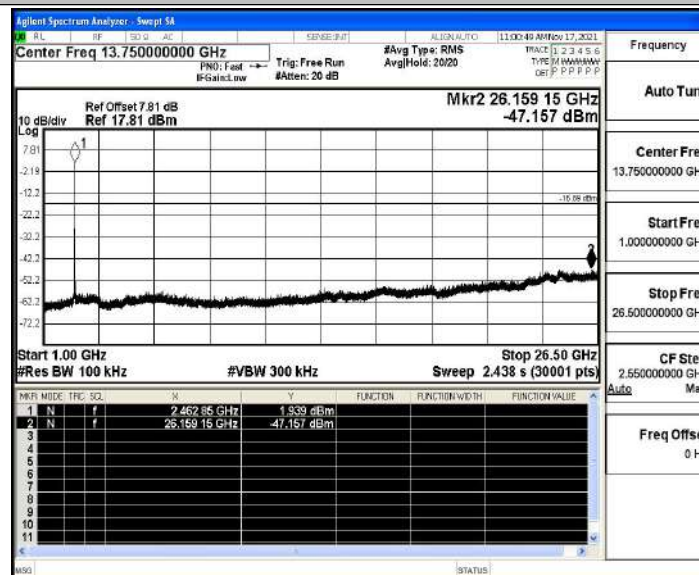
11B_Ant1_2462_0~Reference



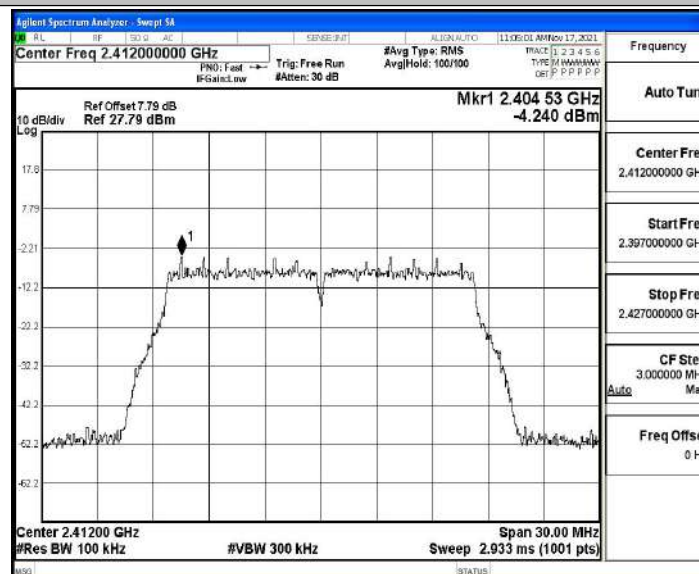
11B_Ant1_2462_30~1000



11B_Ant1_2462_1000~26500

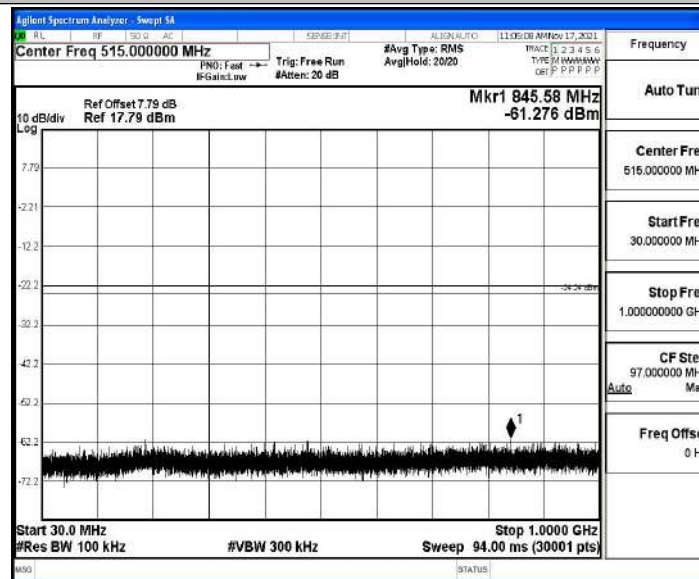


11G_Ant1_2412_0~Reference

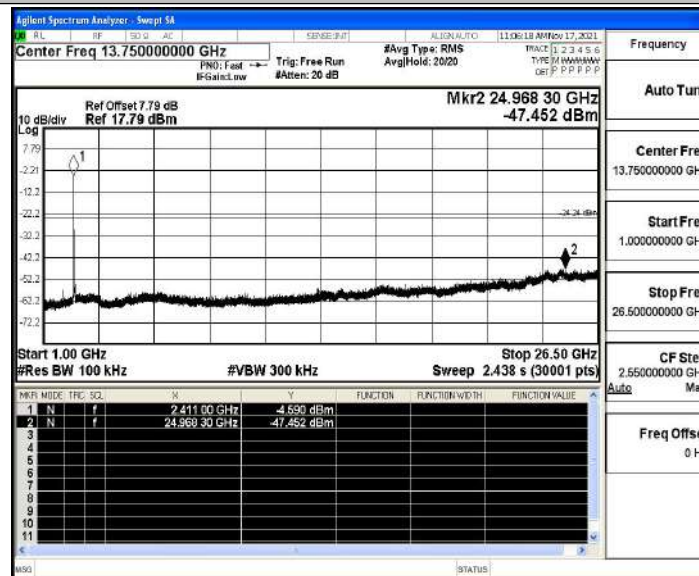




11G_Ant1_2412_30~1000



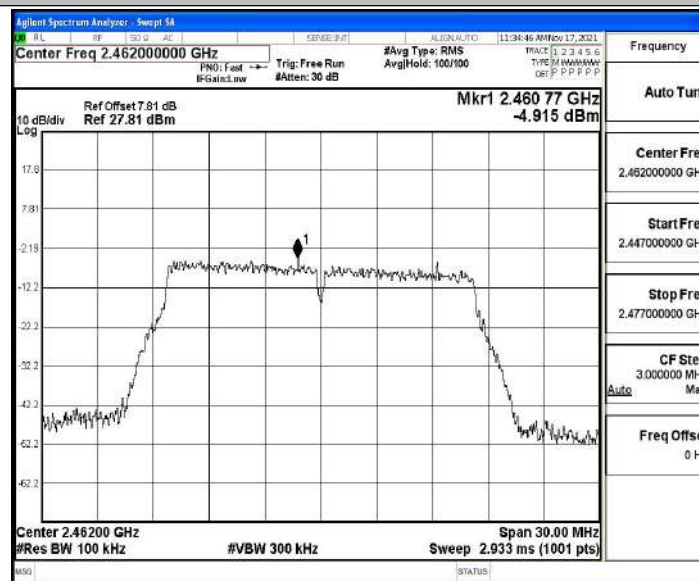
11G_Ant1_2412_1000~26500



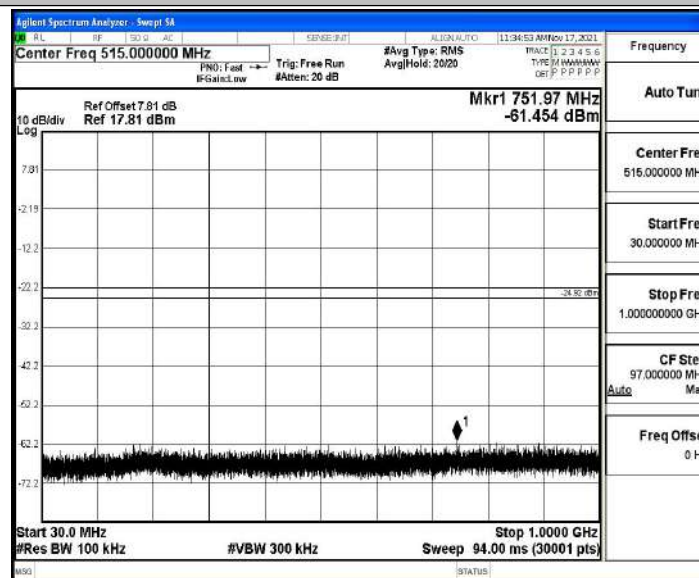
11G_Ant1_2437_0~Reference



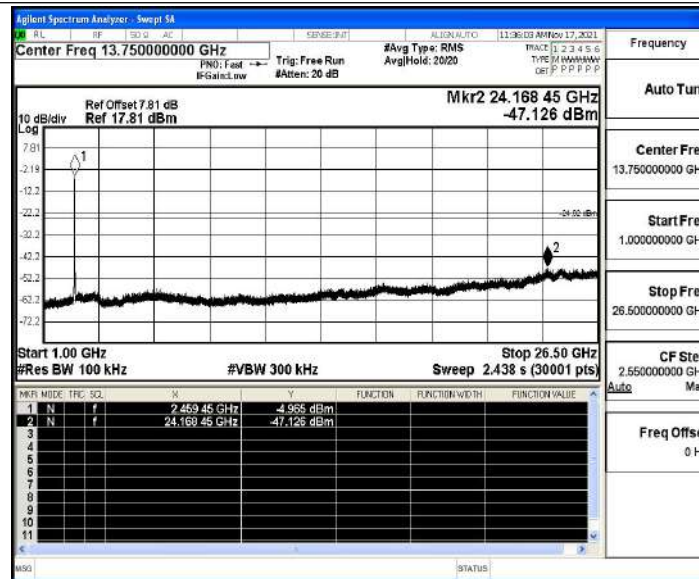
11G_Ant1_2462_0~Reference



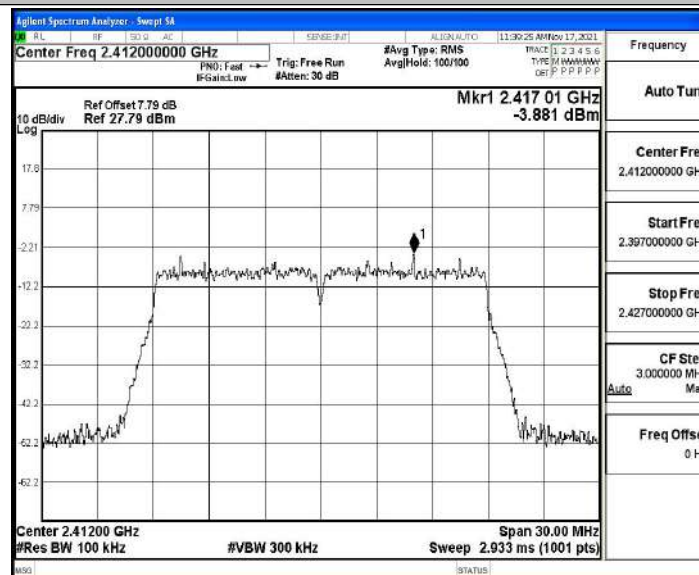
11G_Ant1_2462_30~1000



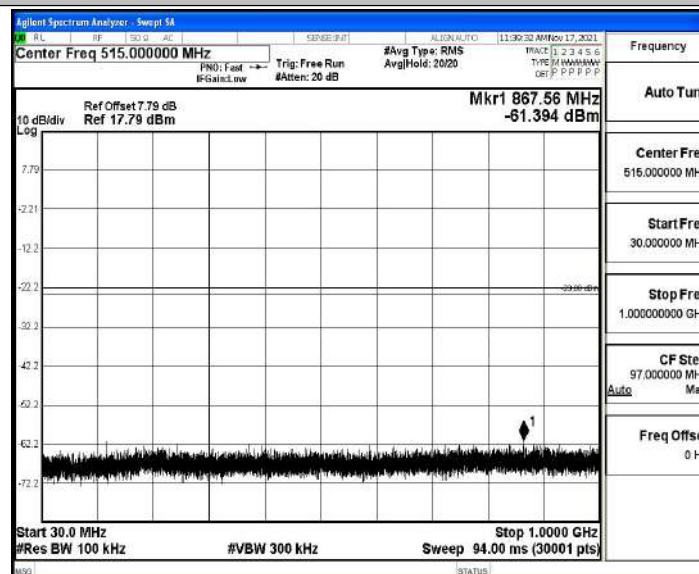
11G_Ant1_2462_1000~26500



11N20SISO_Ant1_2412_0~Reference

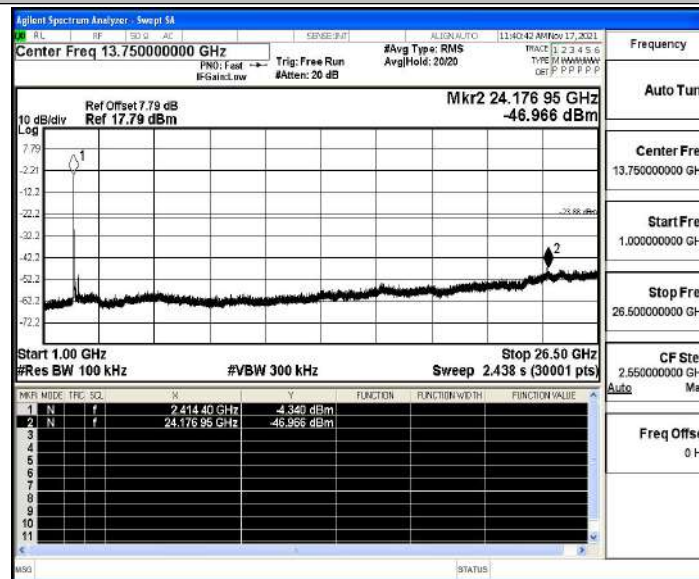


11N20SISO_Ant1_2412_30~1000

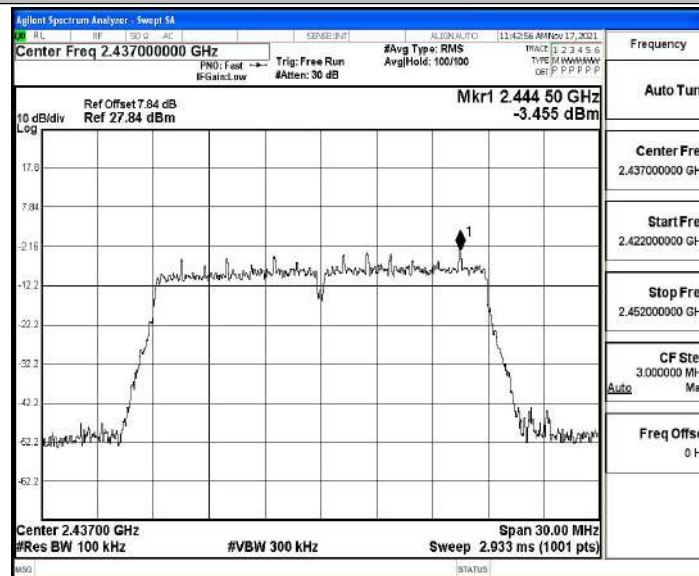




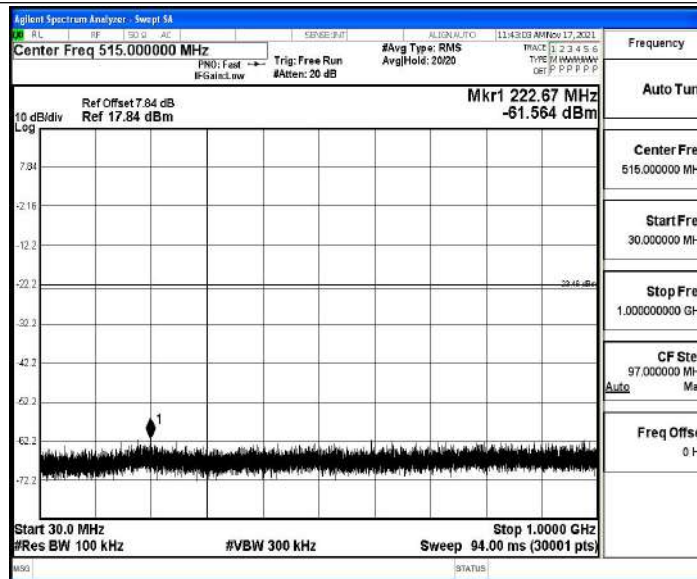
11N20SISO_Ant1_2412_1000~26500



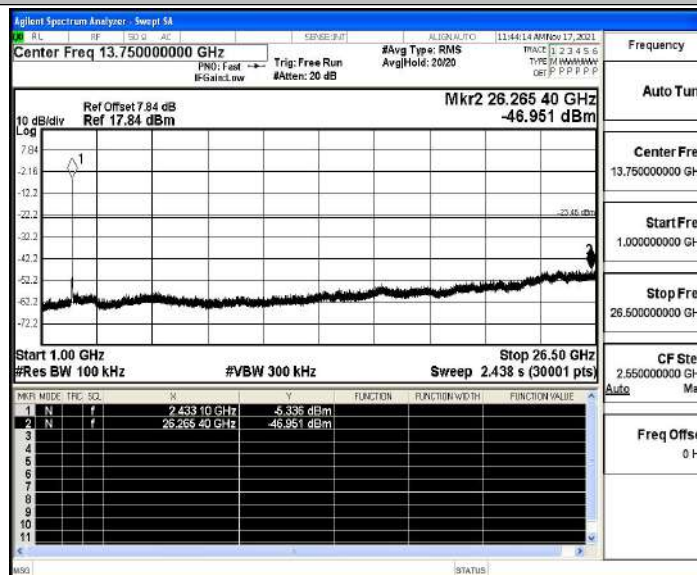
11N20SISO_Ant1_2437_0~Reference



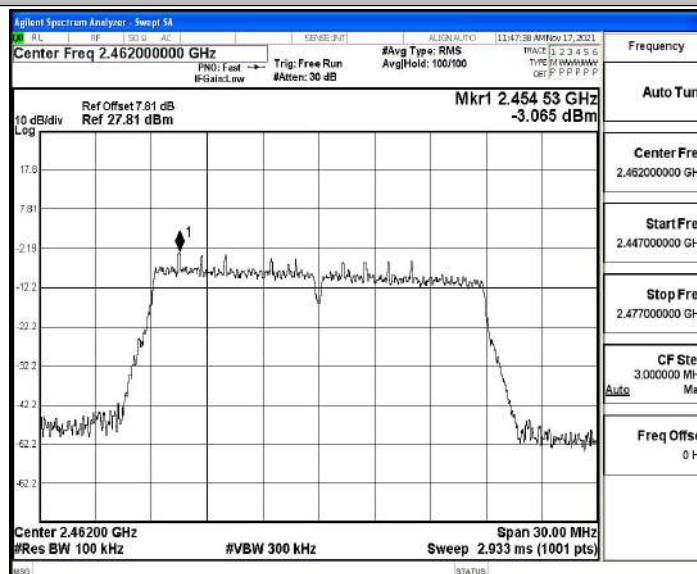
11N20SISO_Ant1_2437_30~1000



11N20SISO_Ant1_2437_1000~26500

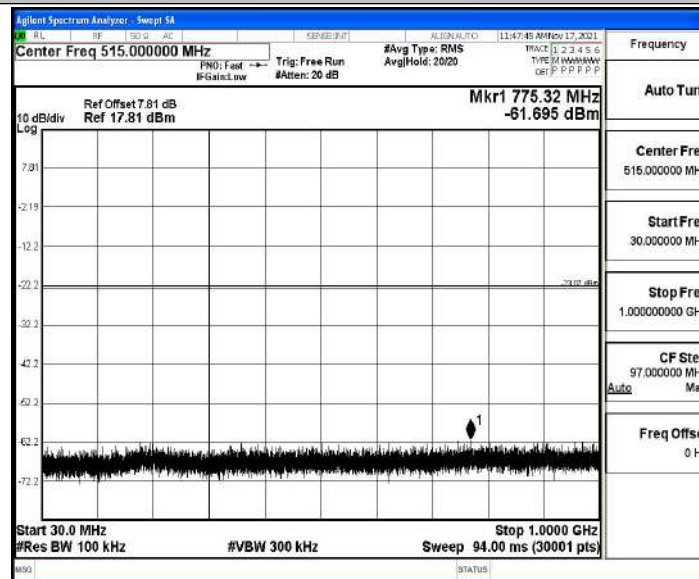


11N20SISO_Ant1_2462_0~Reference

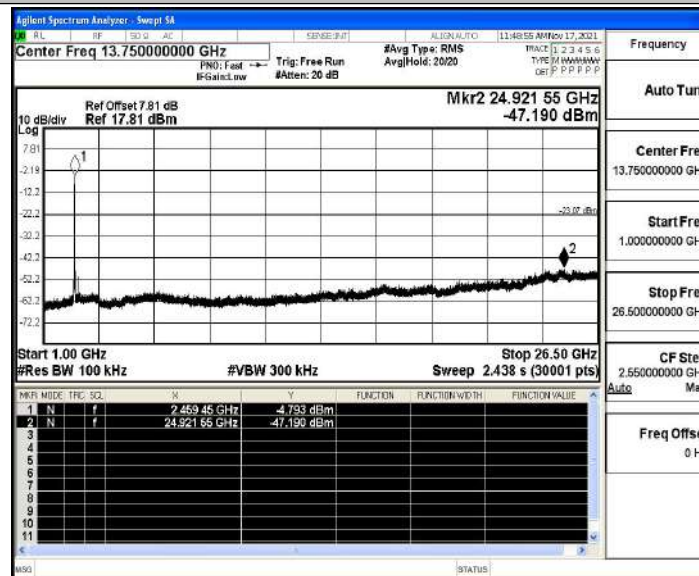




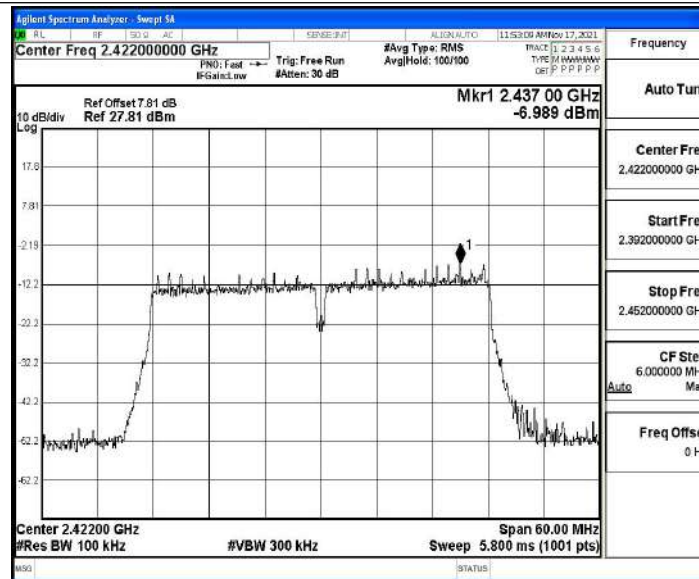
11N20SISO_Ant1_2462_30~1000



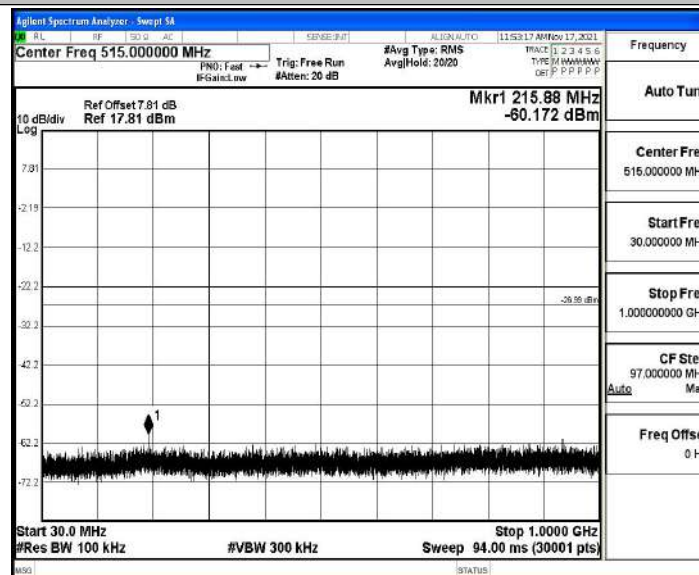
11N20SISO_Ant1_2462_1000~26500



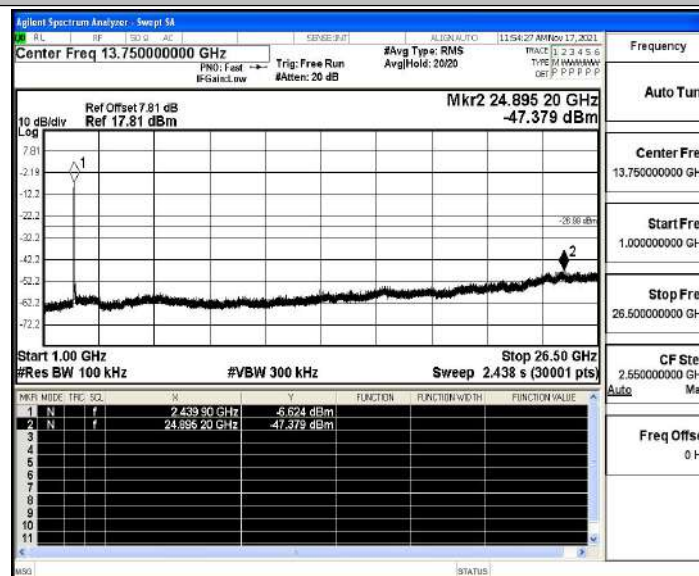
11N40SISO_Ant1_2422_0~Reference



11N40SISO_Ant1_2422_30~1000

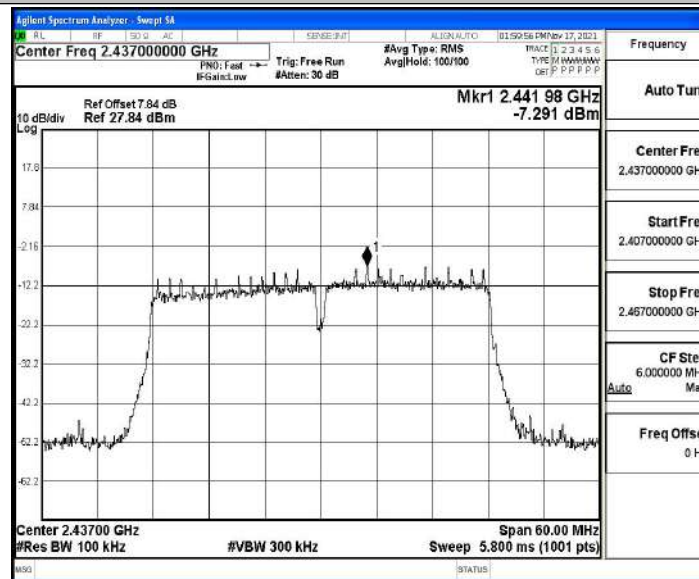


11N40SISO_Ant1_2422_1000~26500

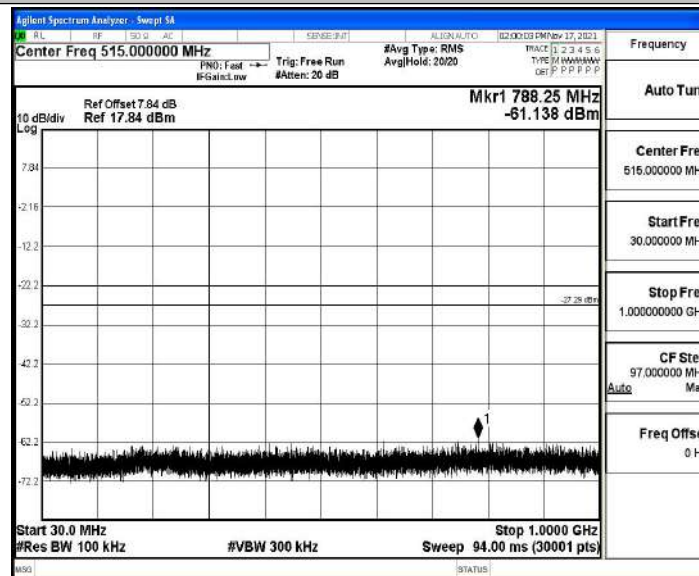




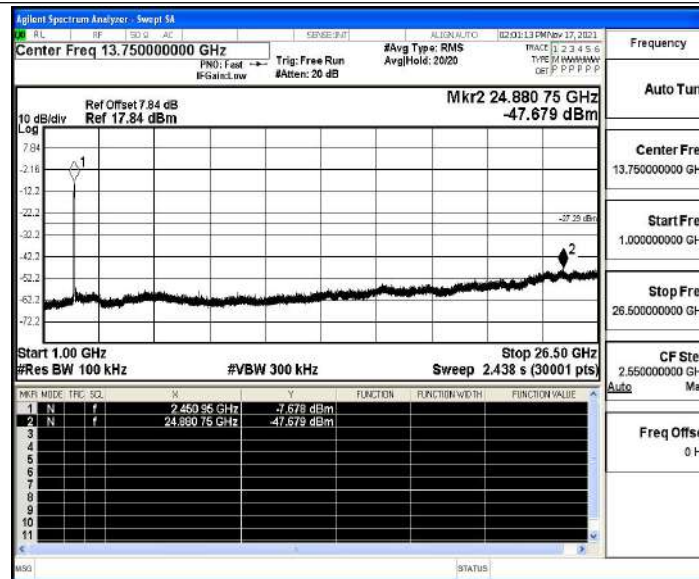
11N40SISO_Ant1_2437_0~Reference



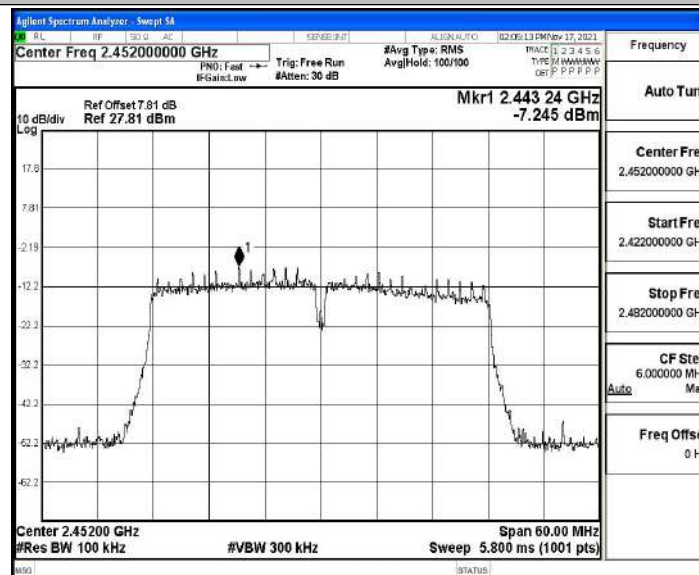
11N40SISO_Ant1_2437_30~1000



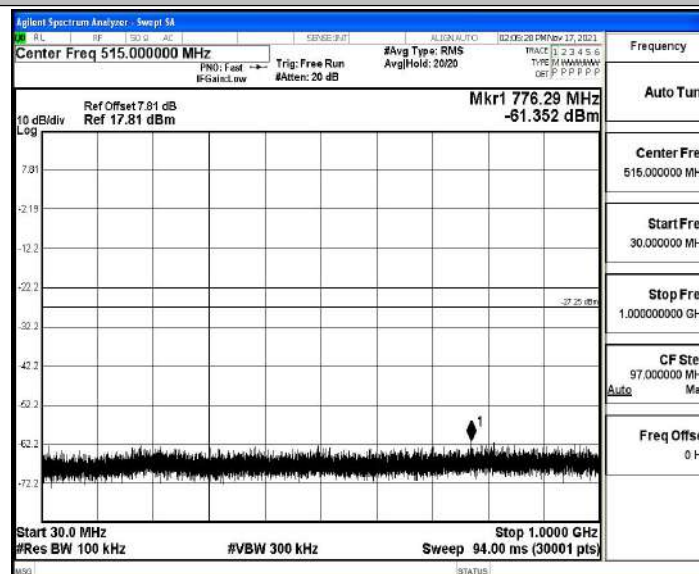
11N40SISO_Ant1_2437_1000~26500

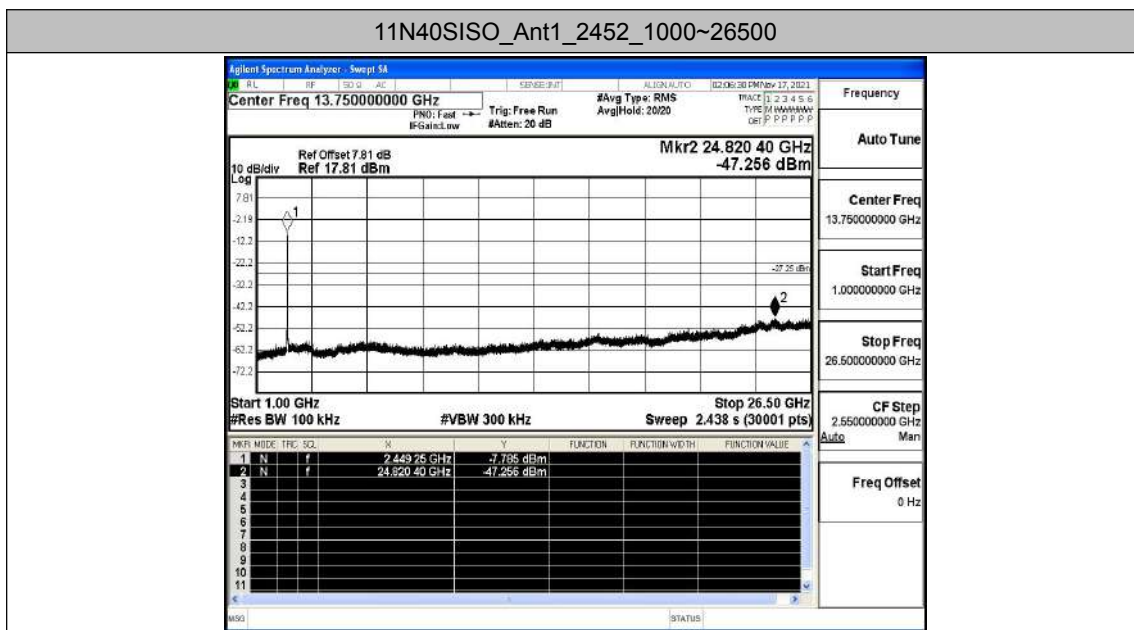


11N40SISO_Ant1_2452_0~Reference



11N40SISO_Ant1_2452_30~1000





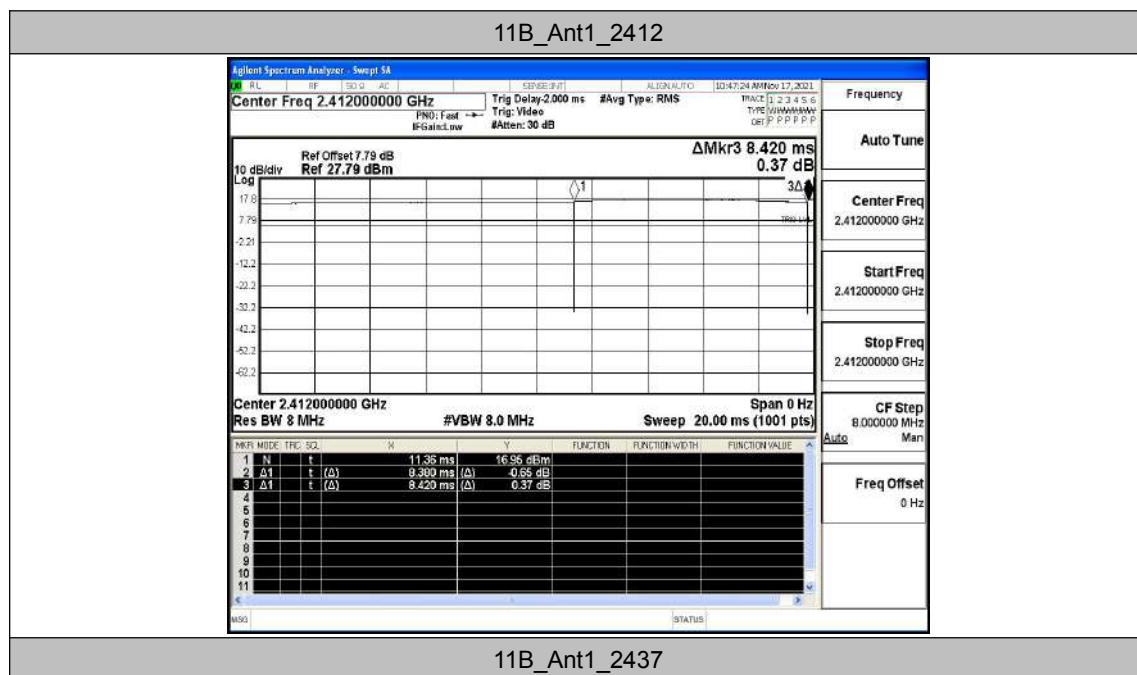


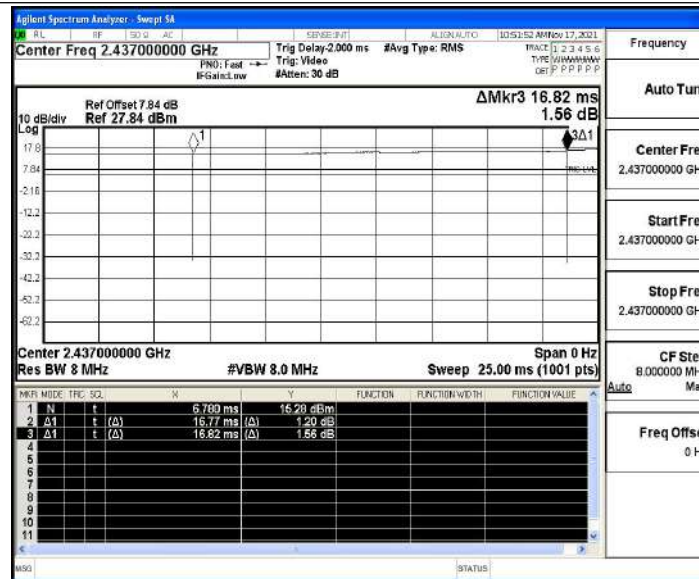
C.6 Duty Cycle

Test Result

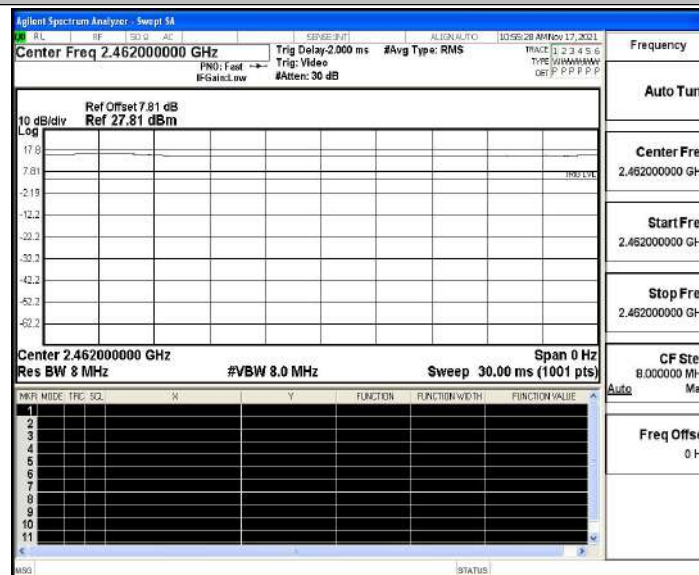
TestMode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	1/T[KHz]
11B	Ant1	2412	8.38	8.42	99.52	---
		2437	16.77	16.82	99.70	---
		2462	30.00	30.00	100.00	---
11G	Ant1	2412	1.39	1.43	97.20	7.19
		2437	1.39	1.43	97.20	7.19
		2462	1.39	1.43	97.20	7.19
11N20SISO	Ant1	2412	1.30	1.34	97.01	7.69
		2437	1.30	1.34	97.01	7.69
		2462	1.30	1.34	97.01	7.69
11N40SISO	Ant1	2422	0.64	0.68	94.12	15.63
		2437	0.64	0.68	94.12	15.63
		2452	0.64	0.68	94.12	15.63

Test Graphs

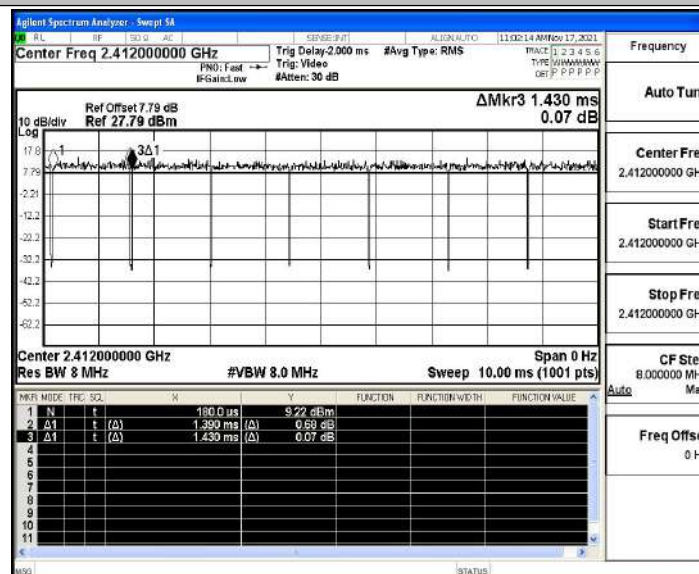




11B_Ant1_2462

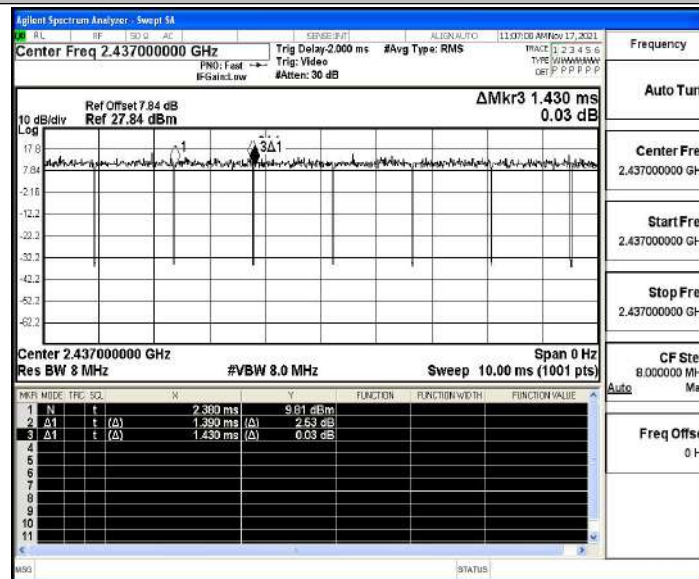


11G_Ant1_2412

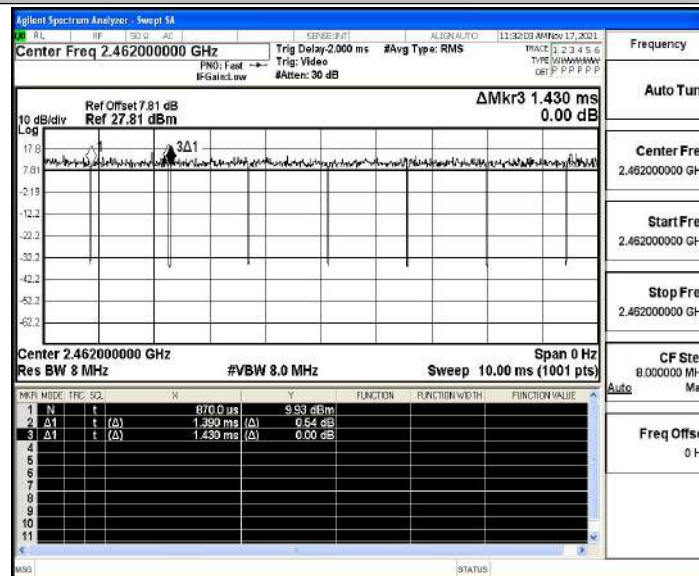




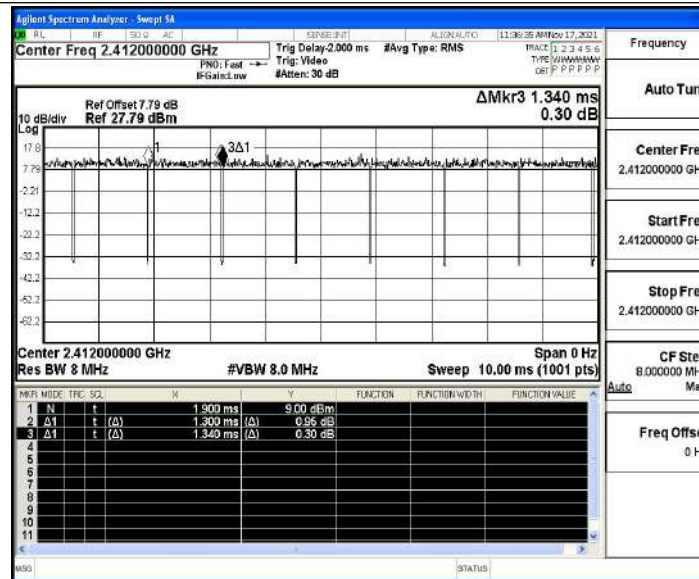
11G_Ant1_2437



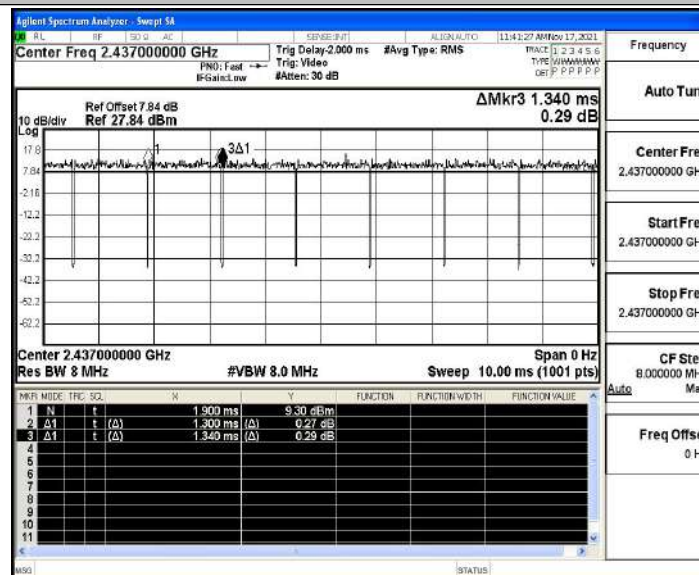
11G_Ant1_2462



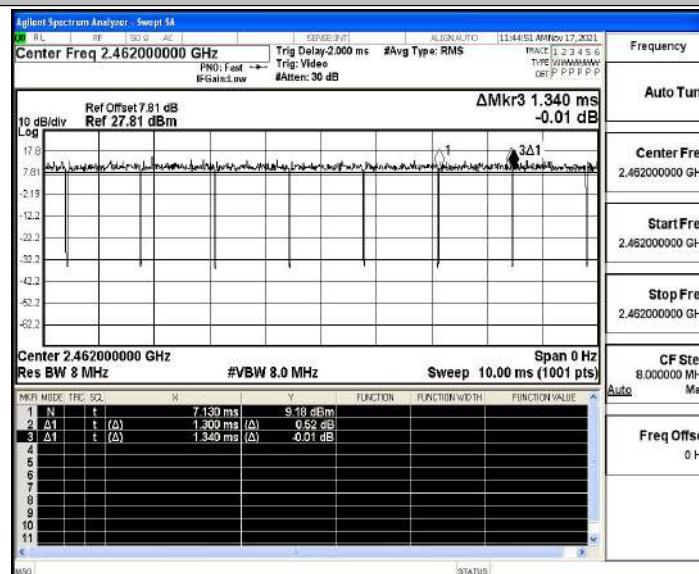
11N20SISO_Ant1_2412



11N20SISO_Ant1_2437

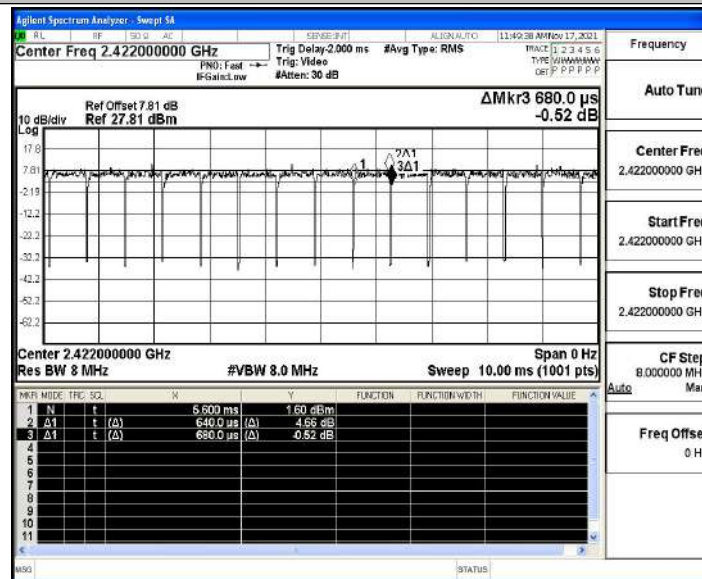


11N20SISO_Ant1_2462

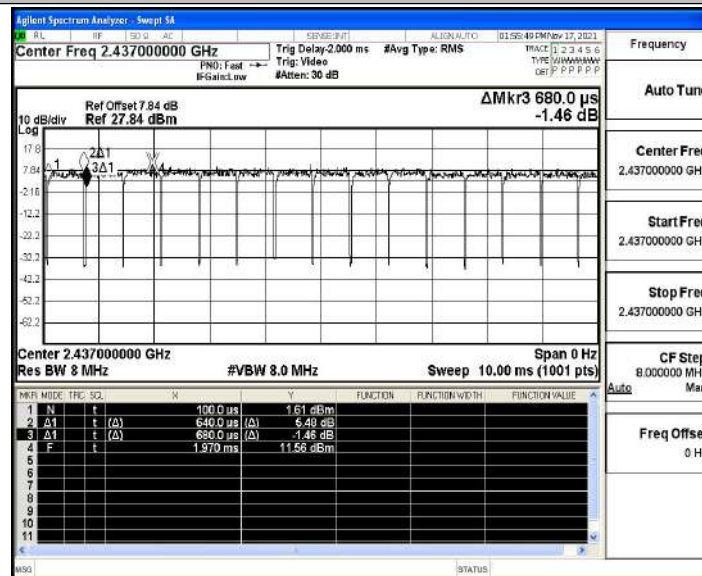




11N40SISO_Ant1_2422



11N40SISO_Ant1_2437



11N40SISO_Ant1_2452



C.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	-49.16	≤-41.20	46.04	≤54	PASS
				AV	2389.570	-48.71	≤-41.20	46.49	≤54	PASS
				AV	2390.000	-48.79	≤-41.20	46.41	≤54	PASS
				Peak	2310.000	-42.99	≤-21.20	52.21	≤74	PASS
				Peak	2337.180	-39.35	≤-21.20	55.85	≤74	PASS
				Peak	2390.000	-43.14	≤-21.20	52.06	≤74	PASS
		High	2462	AV	2483.500	-48.28	≤-41.20	46.92	≤54	PASS
				AV	2487.960	-46.92	≤-41.20	48.28	≤54	PASS
				AV	2500.000	-48.34	≤-41.20	46.86	≤54	PASS
				Peak	2483.500	-42.26	≤-21.20	52.94	≤74	PASS
				Peak	2491.810	-38.78	≤-21.20	56.42	≤74	PASS
				Peak	2500.000	-43.69	≤-21.20	51.51	≤74	PASS
11G	Ant1	Low	2412	AV	2310.000	-48.77	≤-41.20	46.43	≤54	PASS
				AV	2386.840	-48.22	≤-41.20	46.98	≤54	PASS
				AV	2390.000	-48.34	≤-41.20	46.86	≤54	PASS
				Peak	2310.000	-41.26	≤-21.20	53.94	≤74	PASS
				Peak	2388.140	-38.56	≤-21.20	56.64	≤74	PASS
				Peak	2390.000	-41.61	≤-21.20	53.59	≤74	PASS
		High	2462	AV	2483.500	-46.89	≤-41.20	48.31	≤54	PASS
				AV	2488.070	-44.69	≤-41.20	50.51	≤54	PASS
				AV	2500.000	-47.85	≤-41.20	47.35	≤54	PASS
				Peak	2483.500	-40.46	≤-21.20	54.74	≤74	PASS
				Peak	2489.280	-37.26	≤-21.20	57.94	≤74	PASS
				Peak	2500.000	-40.06	≤-21.20	55.14	≤74	PASS
11N20SIS O	Ant1	Low	2412	AV	2310.000	-48.9	≤-41.20	46.30	≤54	PASS
				AV	2389.830	-48.13	≤-41.20	47.07	≤54	PASS
				AV	2390.000	-48.36	≤-41.20	46.84	≤54	PASS
				Peak	2310.000	-42.23	≤-21.20	52.97	≤74	PASS
				Peak	2385.410	-38.43	≤-21.20	56.77	≤74	PASS
				Peak	2390.000	-42.61	≤-21.20	52.59	≤74	PASS
		High	2462	AV	2483.500	-47.03	≤-41.20	48.17	≤54	PASS
				AV	2487.960	-44.7	≤-41.20	50.50	≤54	PASS
				AV	2500.000	-47.69	≤-41.20	47.51	≤54	PASS
				Peak	2483.500	-40.09	≤-21.20	55.11	≤74	PASS
				Peak	2485.430	-37.27	≤-21.20	57.93	≤74	PASS
				Peak	2500.000	-40.96	≤-21.20	54.24	≤74	PASS
11N40SIS	Ant1	Low	2422	AV	2310.000	-48.48	≤-41.20	46.72	≤54	PASS



O				AV	2388.660	-47.78	≤ -41.20	47.42	≤ 54	PASS
				AV	2390.000	-48.14	≤ -41.20	47.06	≤ 54	PASS
				Peak	2310.000	-42.85	≤ -21.20	52.35	≤ 74	PASS
				Peak	2370.460	-38.93	≤ -21.20	56.27	≤ 74	PASS
				Peak	2390.000	-41.34	≤ -21.20	53.86	≤ 74	PASS
		High	2452	AV	2483.500	-47.18	≤ -41.20	48.02	≤ 54	PASS
				AV	2483.890	-46.98	≤ -41.20	48.22	≤ 54	PASS
				AV	2500.000	-47.76	≤ -41.20	47.44	≤ 54	PASS
				Peak	2483.500	-40.21	≤ -21.20	54.99	≤ 74	PASS
				Peak	2484.440	-36.63	≤ -21.20	58.57	≤ 74	PASS
				Peak	2500.000	-41.06	≤ -21.20	54.14	≤ 74	PASS

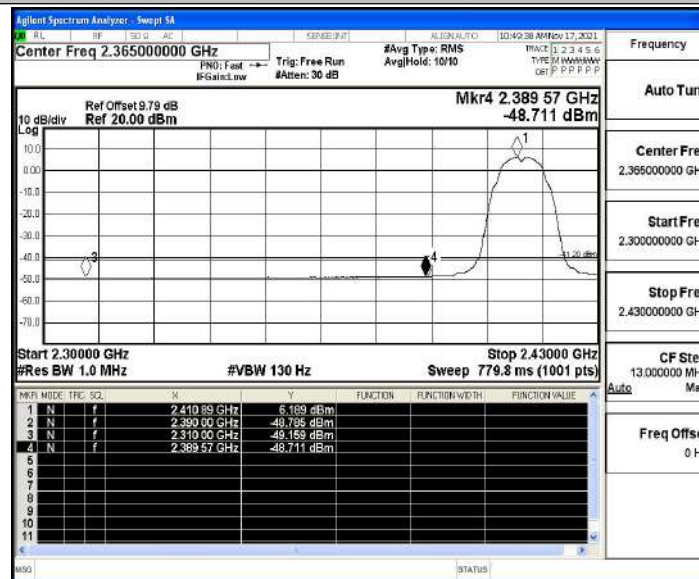
Note:

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.

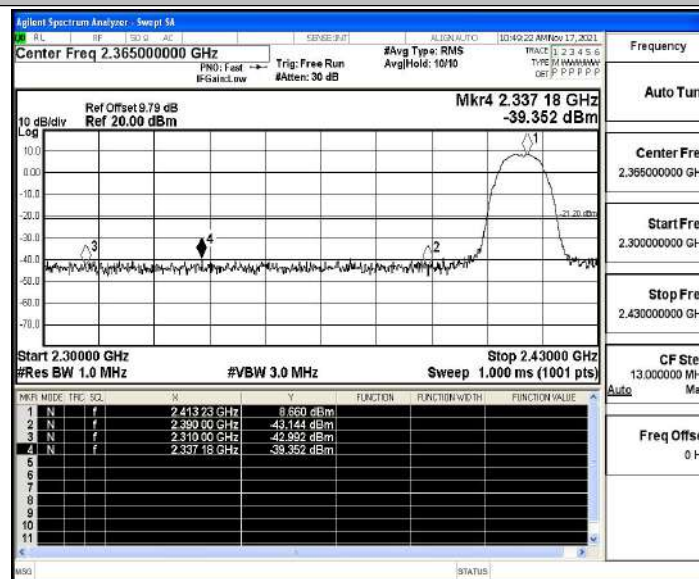


Test Graphs

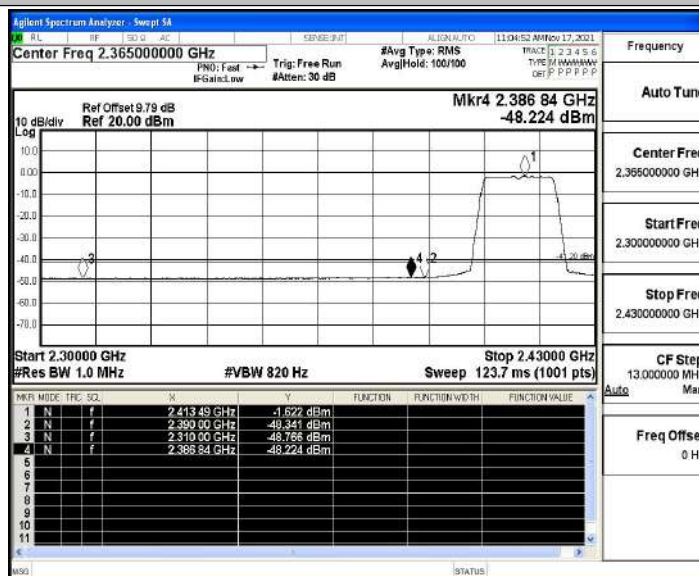
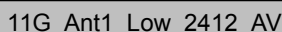
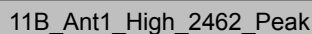
11B_Ant1_Low_2412_AV



11B_Ant1_Low_2412_Peak

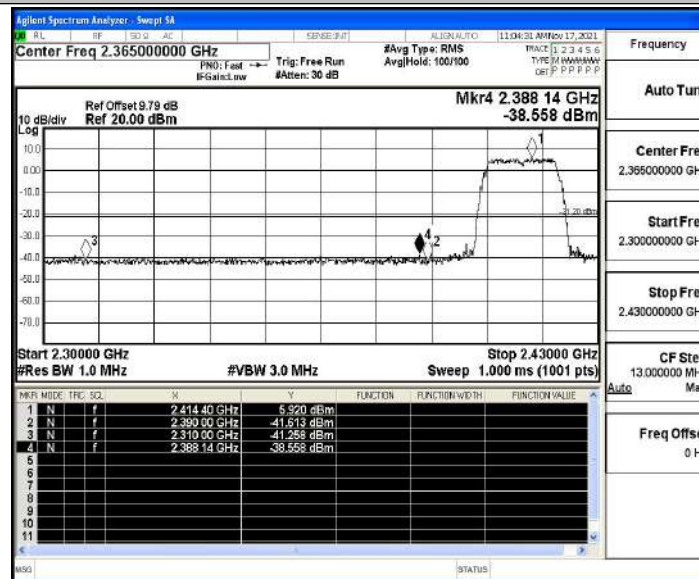


11B_Ant1_High_2462_AV

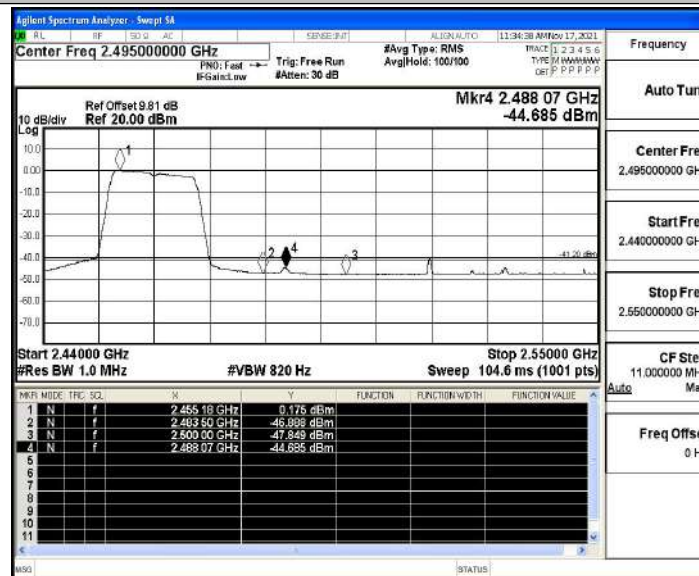




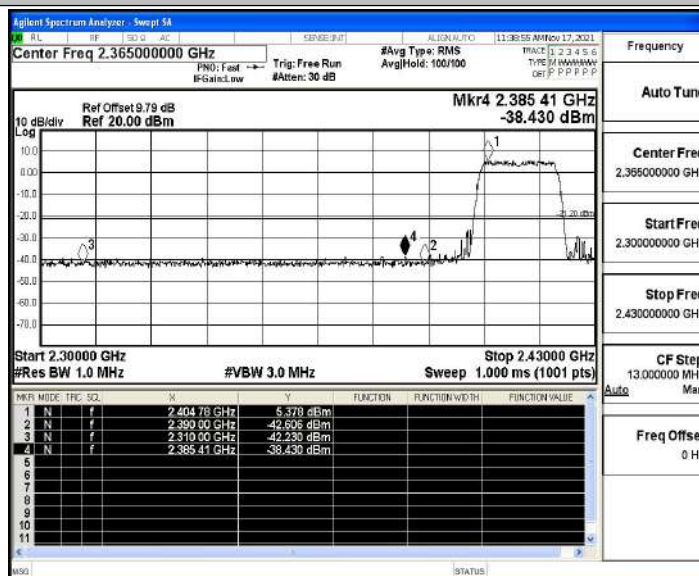
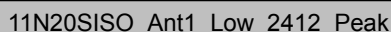
11G_Ant1_Low_2412_Peak



11G_Ant1_High_2462_AV

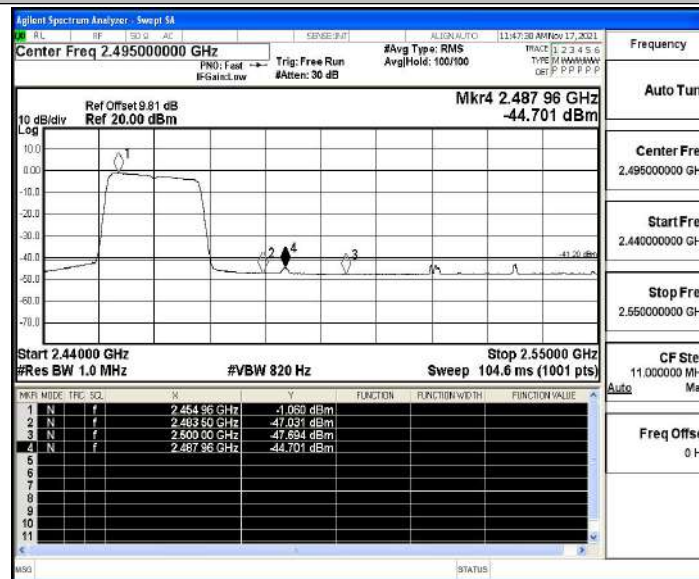


11G_Ant1_High_2462_Peak

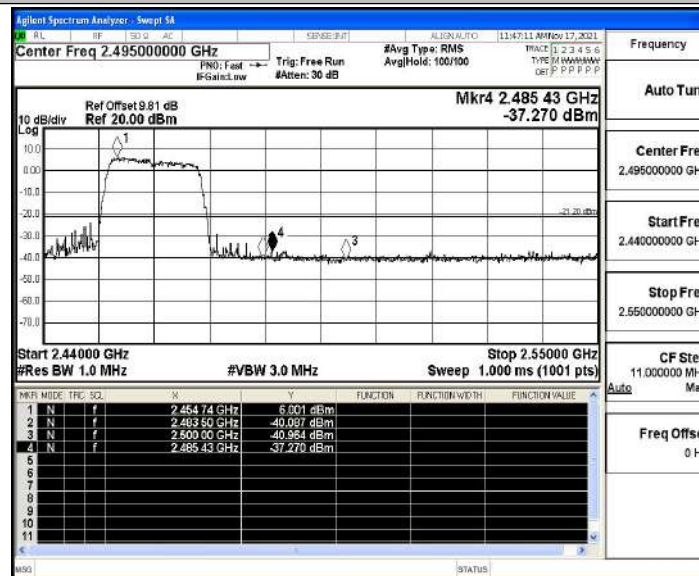




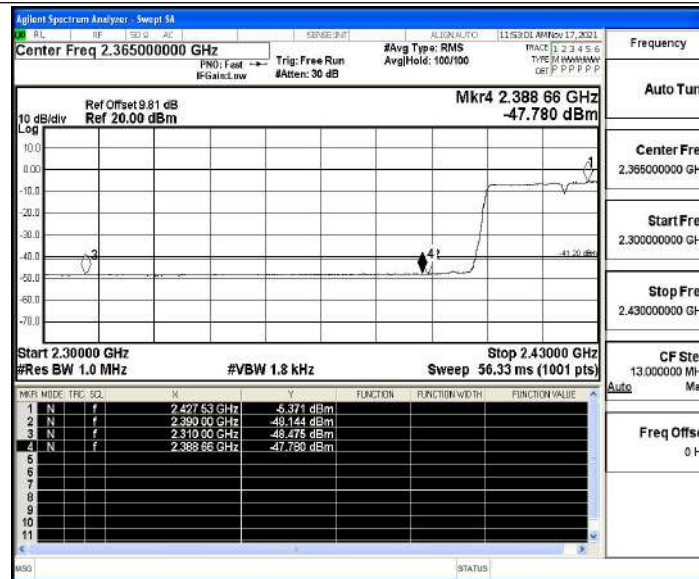
11N20SISO_Ant1_High_2462_AV



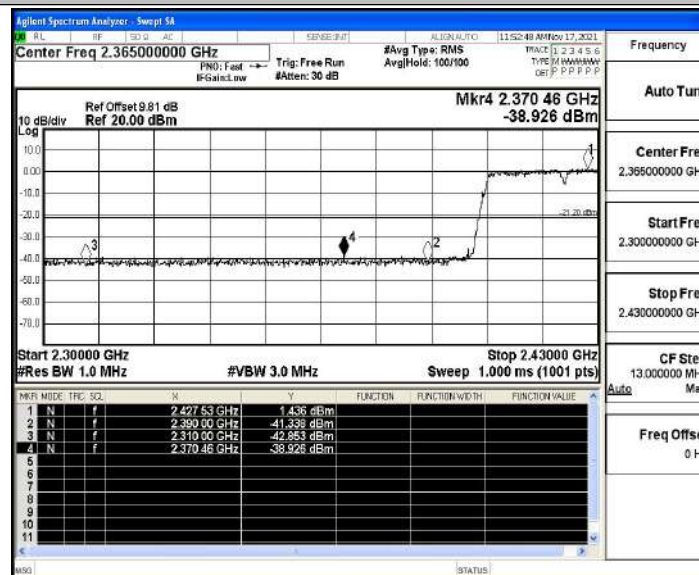
11N20SISO_Ant1_High_2462_Peak



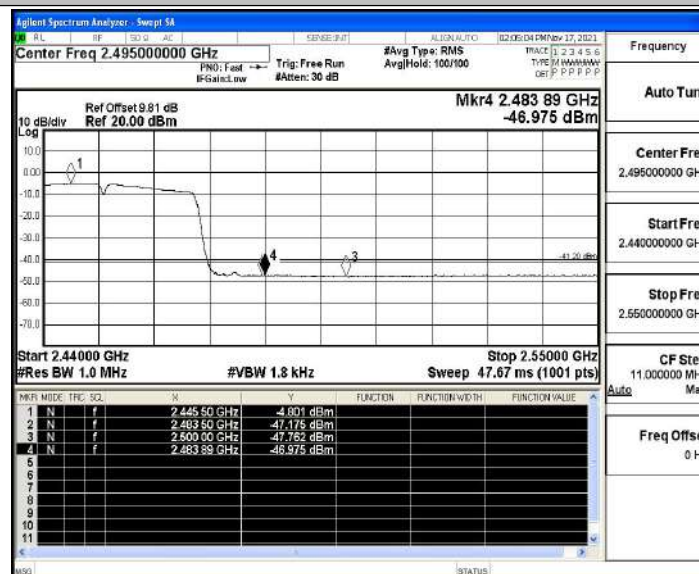
11N40SISO_Ant1_Low_2422_AV



11N40SISO_Ant1_Low_2422_Peak



11N40SISO_Ant1_High_2452_AV



Agilent Spectrum Analyzer - Sweep 5A

File Edit View Options Help

Center Freq 2.495000000 GHz

Ref Offset 9.81 dB
Ref 20.00 dBm

Trig: Free Run
#Attenu: 30 dB

#Avg Type: RMS
Avg Hold: 100/100

Marker 1: 2.495 GHz
Marker 2: 2.4935 GHz
Marker 3: 2.500 GHz
Marker 4: 2.48414 GHz

Frequency

Auto Tune

Center Freq
2.495000000 GHz

Start Freq
2.440000000 GHz

Stop Freq
2.550000000 GHz

CF Step
11.000000 MHz

Auto

Freq Offset
0 Hz

Marker	Freq (GHz)	Power (dBm)
1	2.44847	2.482
2	2.49350	-40.209
3	2.50000	-41.063
4	2.48414	-36.631