Appendix Test Data for WLAN(2. 4G) (Conducted Measurement)

Product Name: High-precision positioning control module

Trade Mark:

Test Model: HY-INP-GNSS

FCC ID: 2A3AS-HY-INP-GNSS

Environmental Conditions

Temperature:	23.5℃
Relative Humidity:	58%
ATM Pressure:	100.0 kPa
Test Engineer:	Allen Lai
Supervised by:	Max Zhang
NOTE	N/A

Appendix A: DTS Bandwidth

Test Result

Test Mode	Antenna	Frequency [MHz]	DTS BW [MHz]	FL [MHz]	FH [MHz]	Limit [MHz]	Verdict
11B	Ant1	2412	10.200	2406.920	2417.120	0.5	PASS
11B	Ant1	2437	10.160	2431.920	2442.080	0.5	PASS
11B	Ant1	2462	10.200	2456.920	2467.120	0.5	PASS
11G	Ant1	2412	16.280	2403.880	2420.160	0.5	PASS
11G	Ant1	2437	16.160	2428.840	2445.000	0.5	PASS
11G	Ant1	2462	16.240	2453.960	2470.200	0.5	PASS
11N20SISO	Ant1	2412	17.480	2403.280	2420.760	0.5	PASS
11N20SISO	Ant1	2437	17.280	2428.320	2445.600	0.5	PASS
11N20SISO	Ant1	2462	17.360	2453.400	2470.760	0.5	PASS
11N40SISO	Ant1	2422	36.080	2403.920	2440.000	0.5	PASS
11N40SISO	Ant1	2437	35.680	2419.160	2454.840	0.5	PASS
11N40SISO	Ant1	2452	36.160	2433.840	2470.000	0.5	PASS

Note: offset(dB) = cable loss(dB) + attenuator factor(dB)

Test Graphs

11B-Ant1-2412-PASS

11B-Ant1-2437-PASS

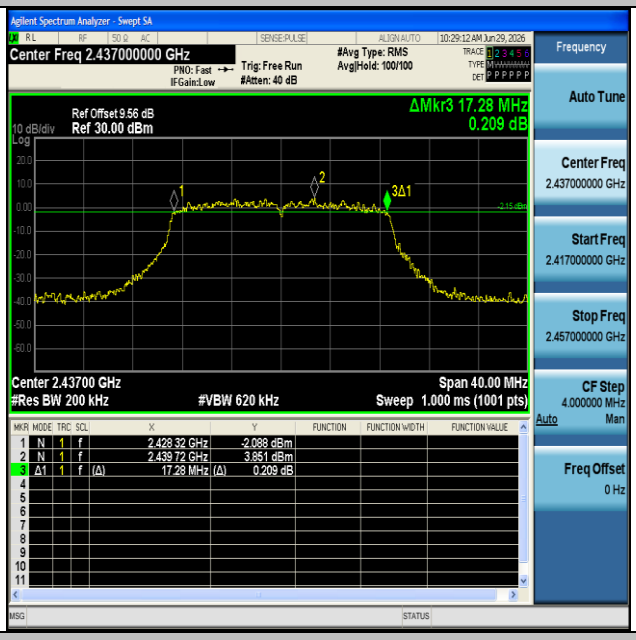
11B-Ant1-2462-PASS

11G-Ant1-2412-PASS

11G-Ant1-2437-PASS

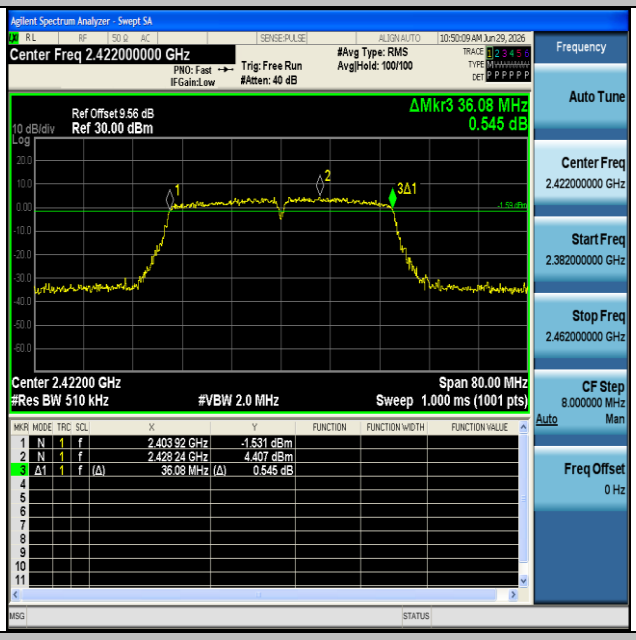
11G-Ant1-2462-PASS

11N20SISO-Ant1-2412-PASS

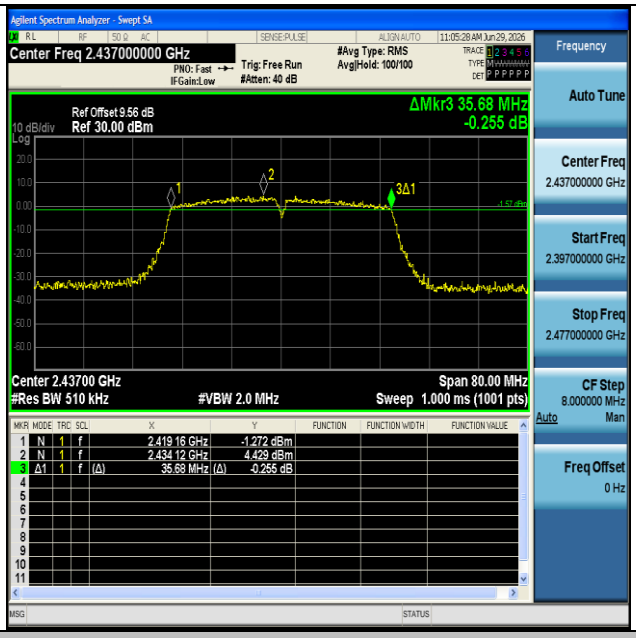


11N20SISO-Ant1-2437-PASS

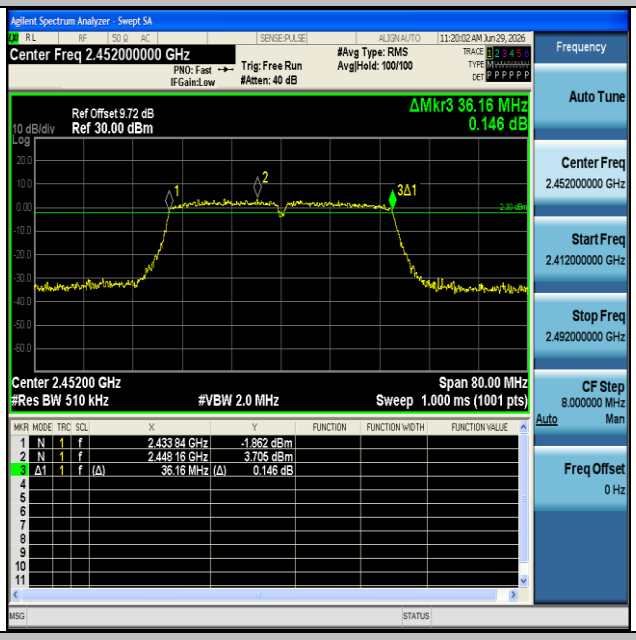
11N20SISO-Ant1-2462-PASS



11N40SISO-Ant1-2422-PASS



11N40SISO-Ant1-2437-PASS



11N40SISO-Ant1-2452-PASS

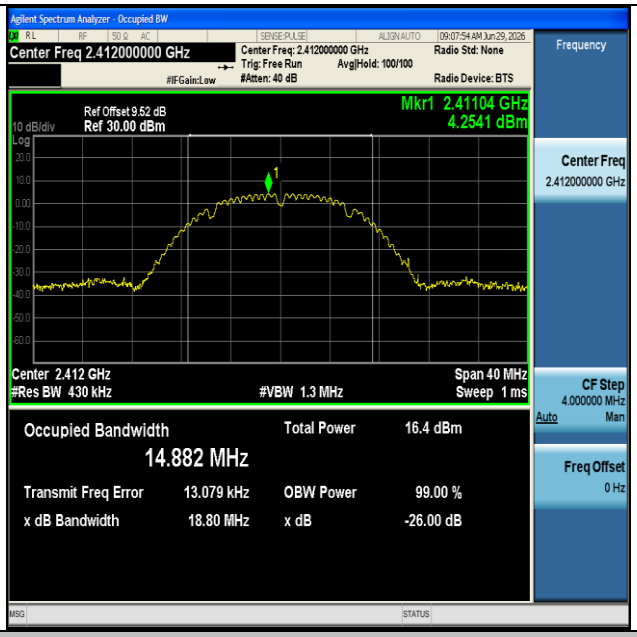
Appendix B: Occupied Channel Bandwidth

Test Result

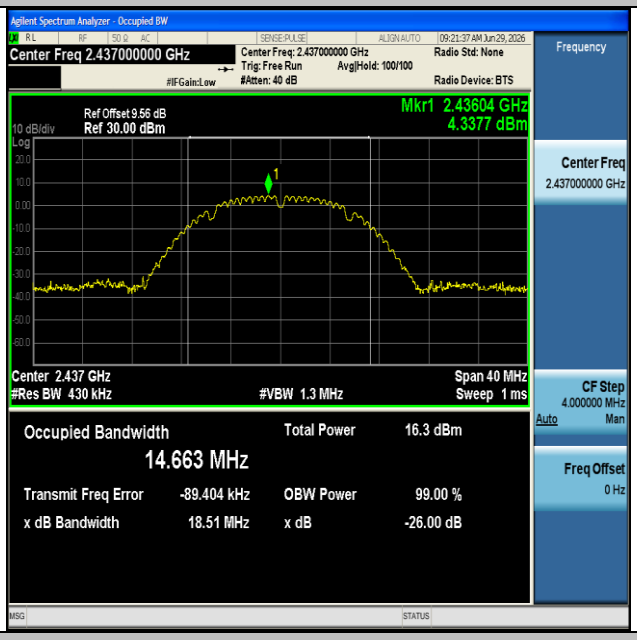
Test Mode	Antenna	Channel Frequency [MHz]	OCB [MHz]	FL [MHz]	FH [MHz]	Limit [MHz]	Verdict
11B	Ant1	2412	14.882	2404.5721	2419.4541	---	---
11B	Ant1	2437	14.663	2429.5791	2444.2421	---	---
11B	Ant1	2462	14.827	2454.6386	2469.4656	---	---
11G	Ant1	2412	16.756	2403.6794	2420.4354	---	---
11G	Ant1	2437	16.667	2428.6366	2445.3036	---	---
11G	Ant1	2462	16.690	2453.7041	2470.3941	---	---
11N20SISO	Ant1	2412	17.894	2403.0846	2420.9786	---	---
11N20SISO	Ant1	2437	17.790	2428.0847	2445.8747	---	---
11N20SISO	Ant1	2462	17.830	2453.1097	2470.9397	---	---
11N40SISO	Ant1	2422	36.230	2403.9645	2440.1945	---	---
11N40SISO	Ant1	2437	36.081	2418.9714	2455.0524	---	---
11N40SISO	Ant1	2452	36.292	2433.8901	2470.1821	---	---

Note: offset(dB) = cable loss(dB) + attenuator factor(dB)

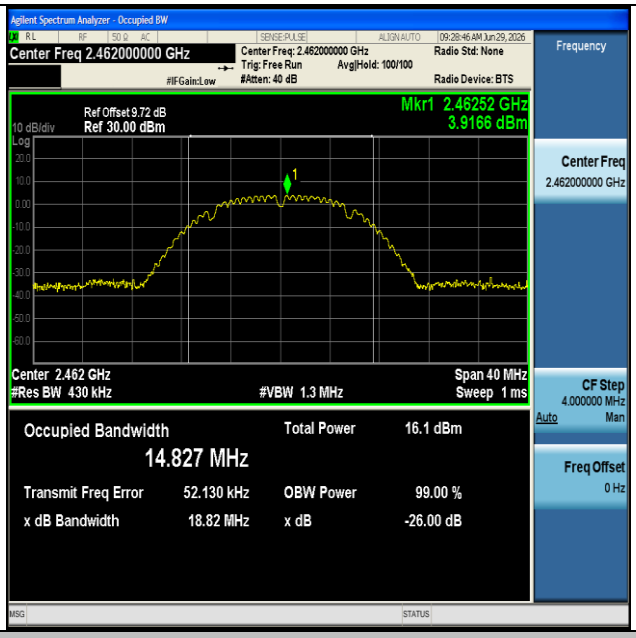
Test Graphs



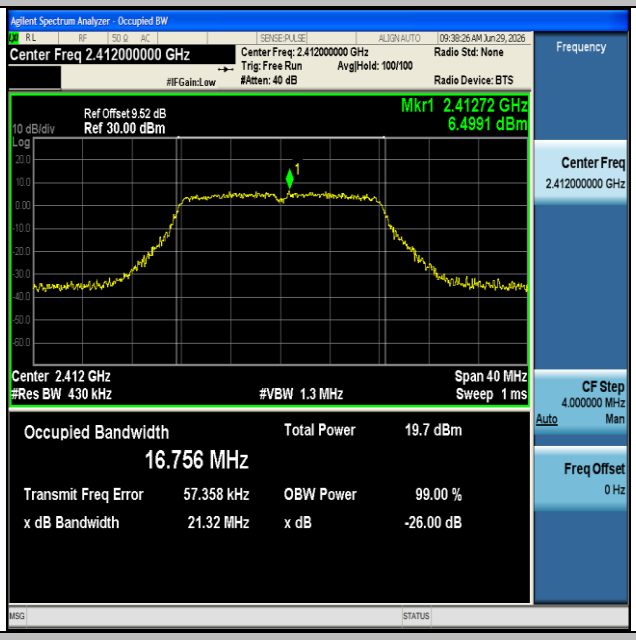
11B-Ant1-2412



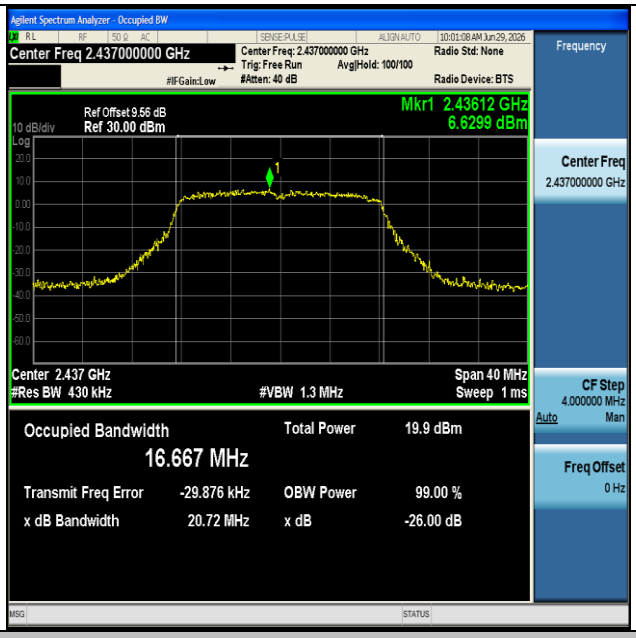
11B-Ant1-2437



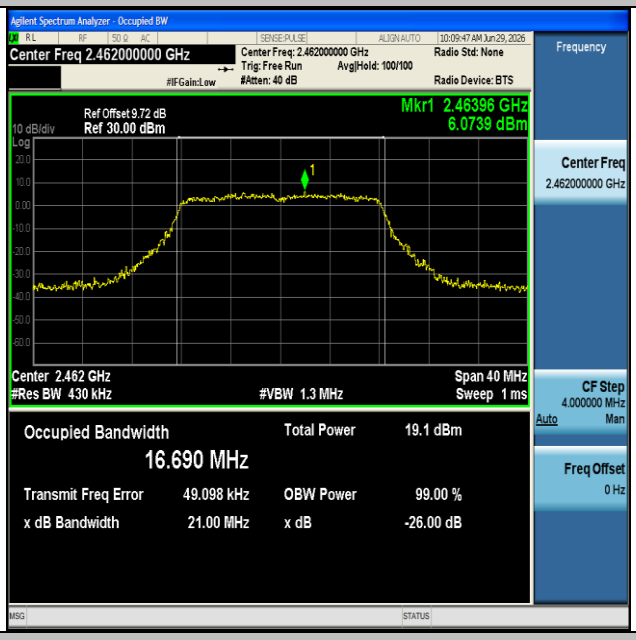
11B-Ant1-2462



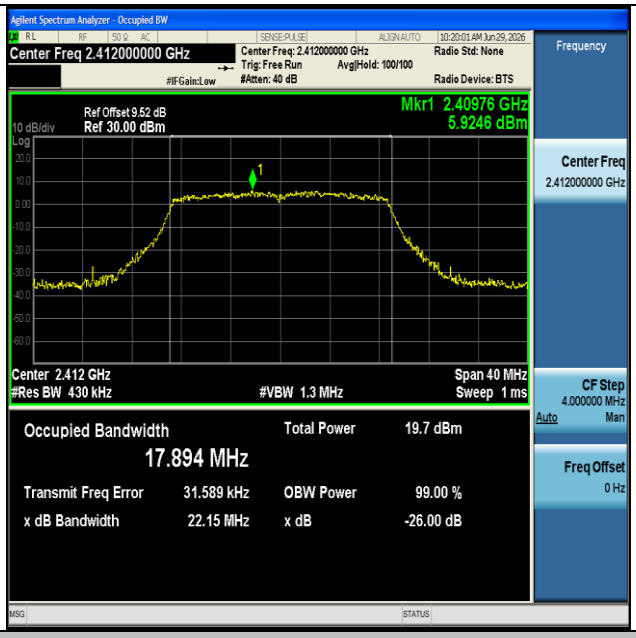
11G-Ant1-2412



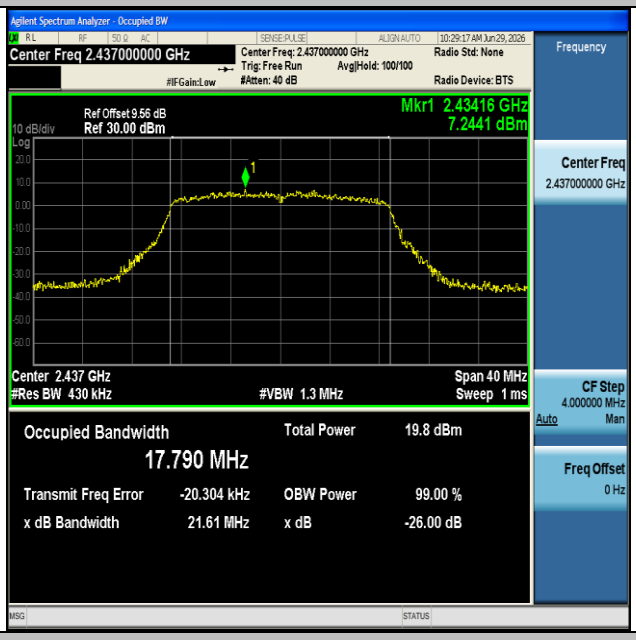
11G-Ant1-2437



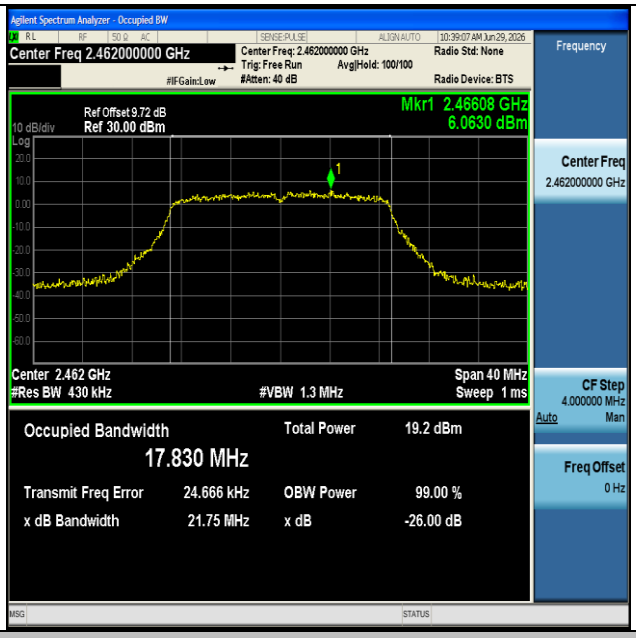
11G-Ant1-2462



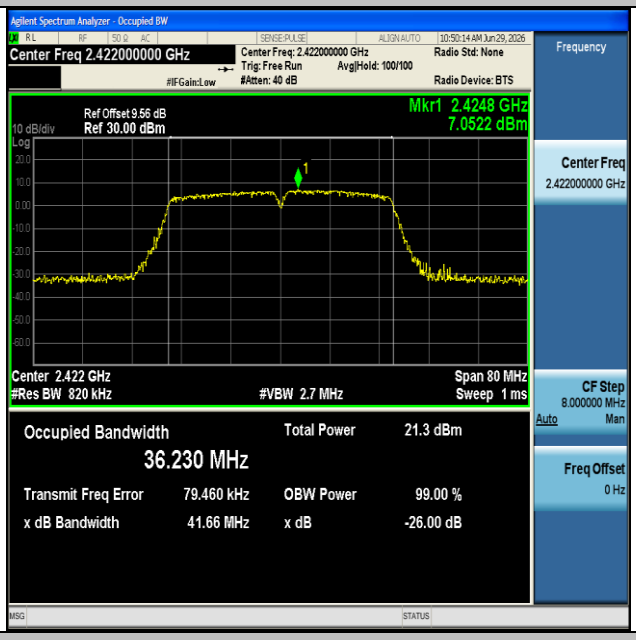
11N20SISO-Ant1-2412



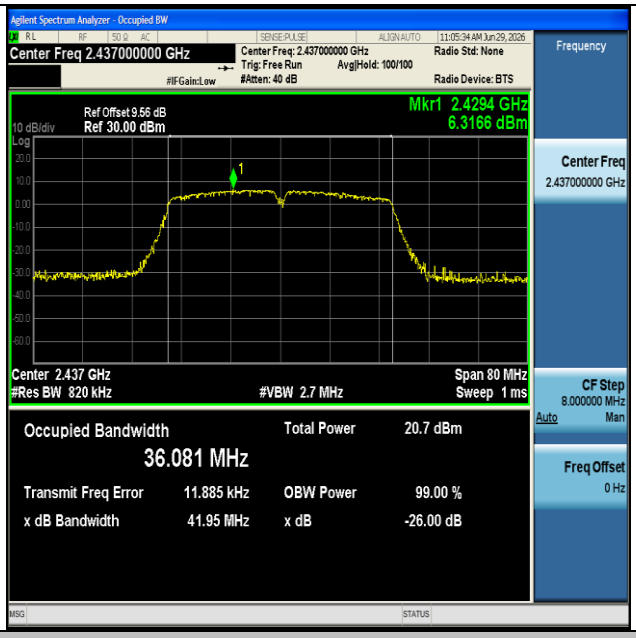
11N20SISO-Ant1-2437



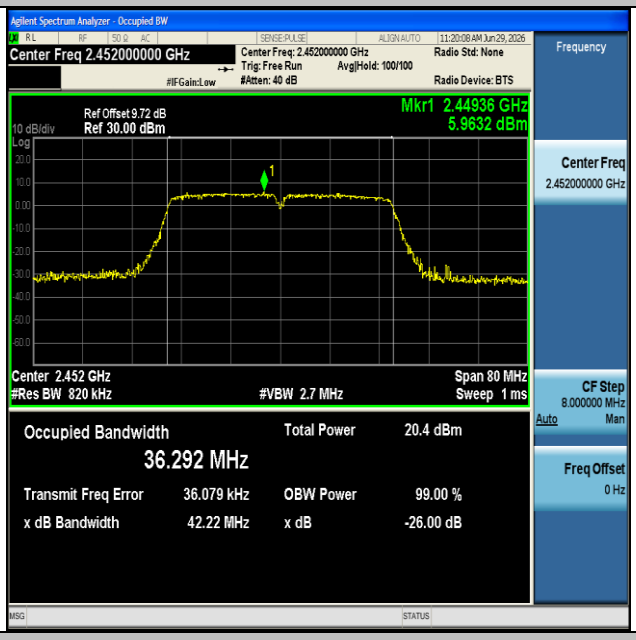
11N20SISO-Ant1-2462



11N40SISO-Ant1-2422



11N40SISO-Ant1-2437



11N40SISO-Ant1-2452

Appendix C: Maximum Average conducted output power

Test Result

Test Mode	Antenna	Frequency [MHz]	Conducted Power [dBm]	Conducted Limit [dBm]	Verdict
11B	Ant1	2412	13.34	≤30.00	PASS
11B	Ant1	2437	13.23	≤30.00	PASS
11B	Ant1	2462	12.93	≤30.00	PASS
11G	Ant1	2412	13.90	≤30.00	PASS
11G	Ant1	2437	13.94	≤30.00	PASS
11G	Ant1	2462	13.30	≤30.00	PASS
11N20SISO	Ant1	2412	13.87	≤30.00	PASS
11N20SISO	Ant1	2437	13.93	≤30.00	PASS
11N20SISO	Ant1	2462	13.37	≤30.00	PASS
11N40SISO	Ant1	2422	14.58	≤30.00	PASS
11N40SISO	Ant1	2437	14.16	≤30.00	PASS
11N40SISO	Ant1	2452	13.64	≤30.00	PASS

Note: offset(dB) = cable loss(dB) + attenuator factor(dB) + Duty Cycle Factor(dB)

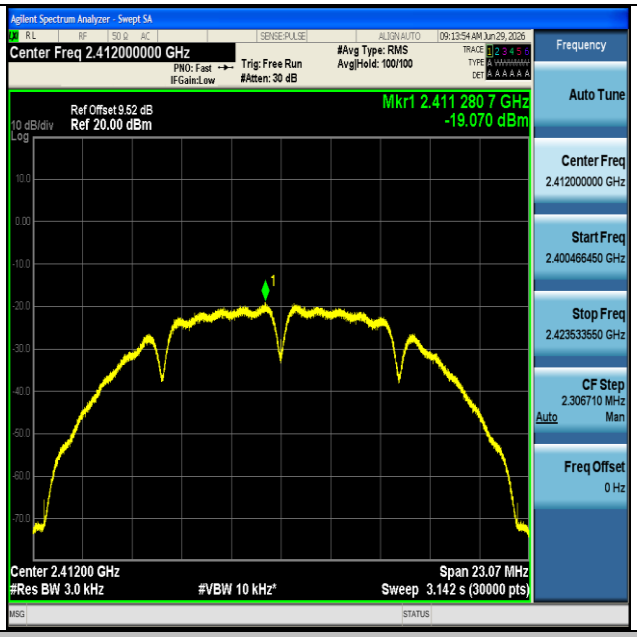
Appendix D: Maximum Average power spectral density

Test Result

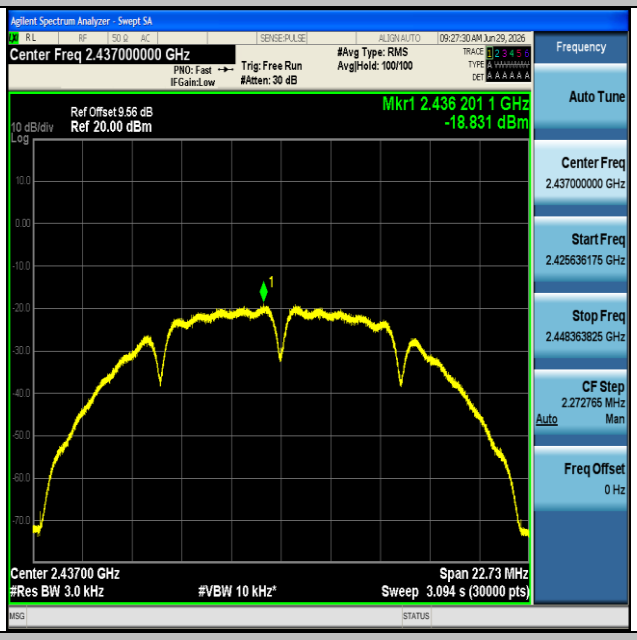
Test Mode	Antenna	Frequency [MHz]	Raw. Data [dBm/3kHz]	Dc. Factor	Result [dBm/3kHz]	Limit [dBm/3kHz]	Verdict
11B	Ant1	2412	-19.21	0.14	-19.07	≤8.00	PASS
11B	Ant1	2437	-19.00	0.17	-18.83	≤8.00	PASS
11B	Ant1	2462	-19.60	0.15	-19.45	≤8.00	PASS
11G	Ant1	2412	-17.84	0.46	-17.38	≤8.00	PASS
11G	Ant1	2437	-17.53	0.44	-17.09	≤8.00	PASS
11G	Ant1	2462	-18.23	0.46	-17.77	≤8.00	PASS
11N20SISO	Ant1	2412	-18.17	0.49	-17.68	≤8.00	PASS
11N20SISO	Ant1	2437	-17.86	0.49	-17.37	≤8.00	PASS
11N20SISO	Ant1	2462	-16.99	0.49	-16.50	≤8.00	PASS
11N40SISO	Ant1	2422	-18.78	0.95	-17.83	≤8.00	PASS
11N40SISO	Ant1	2437	-20.31	0.95	-19.36	≤8.00	PASS
11N40SISO	Ant1	2452	-20.80	0.95	-19.85	≤8.00	PASS

Note: offset(dB) = cable loss(dB) + attenuator factor(dB) + Duty Cycle Factor(dB)

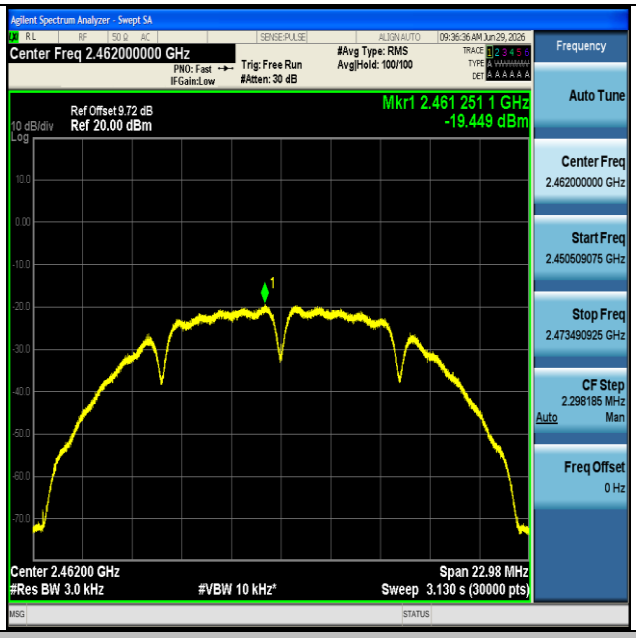
Test Graphs



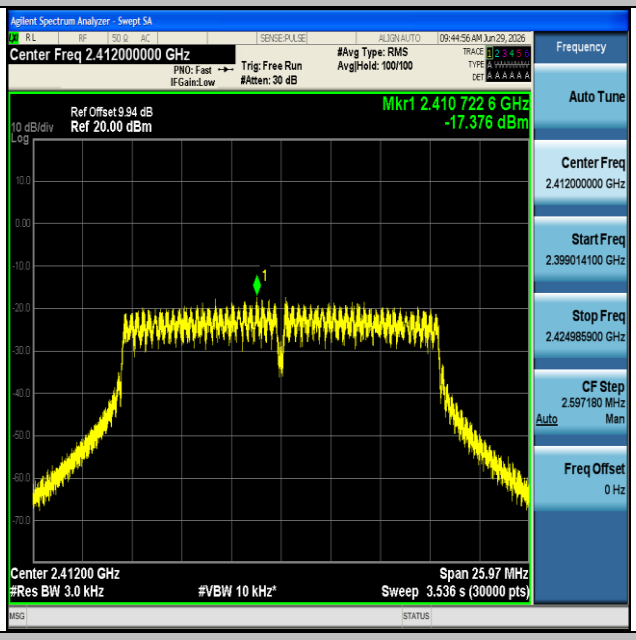
11B-Ant1-2412-PASS



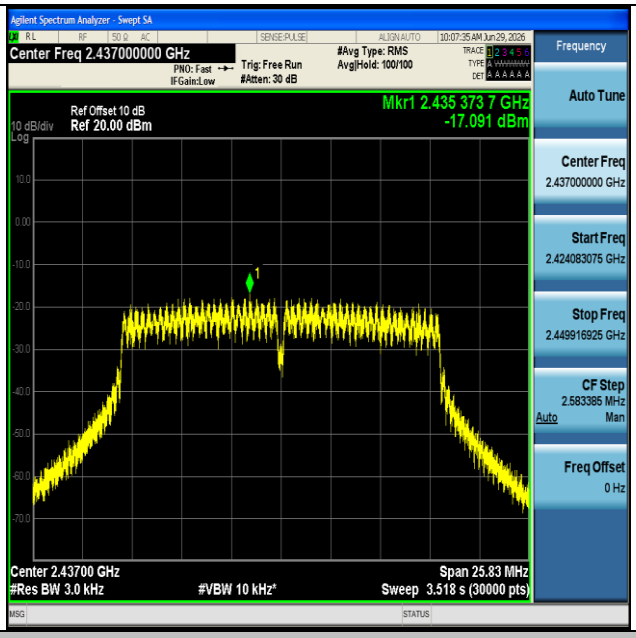
11B-Ant1-2437-PASS



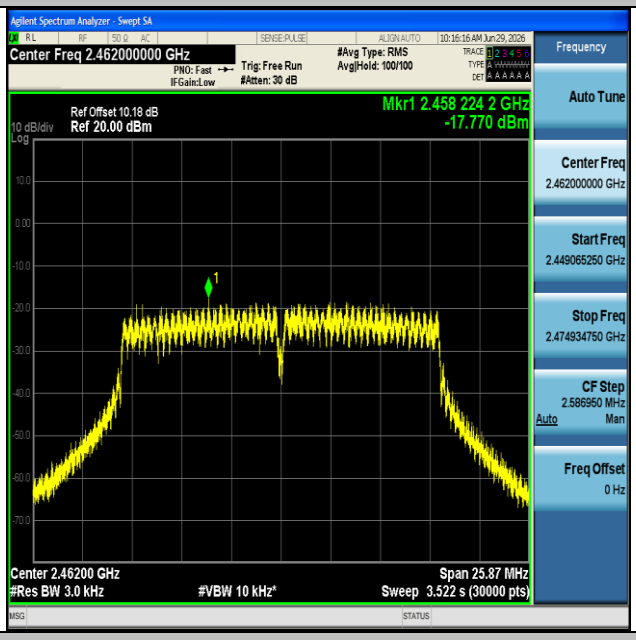
11B-Ant1-2462-PASS



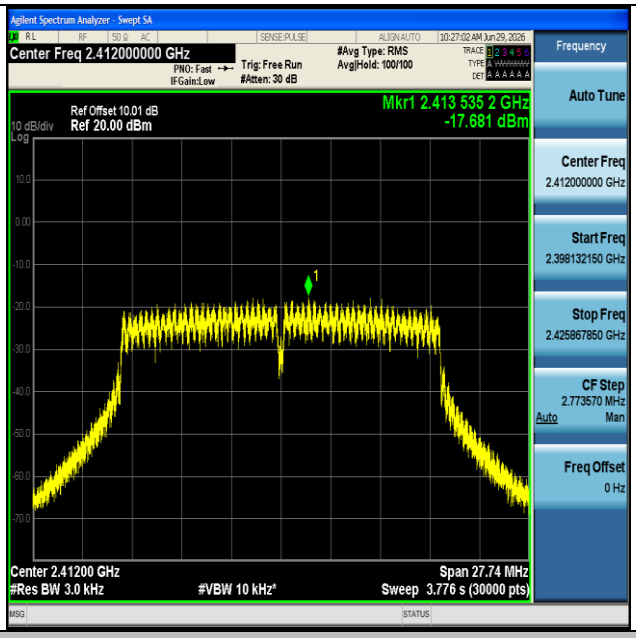
11G-Ant1-2412-PASS



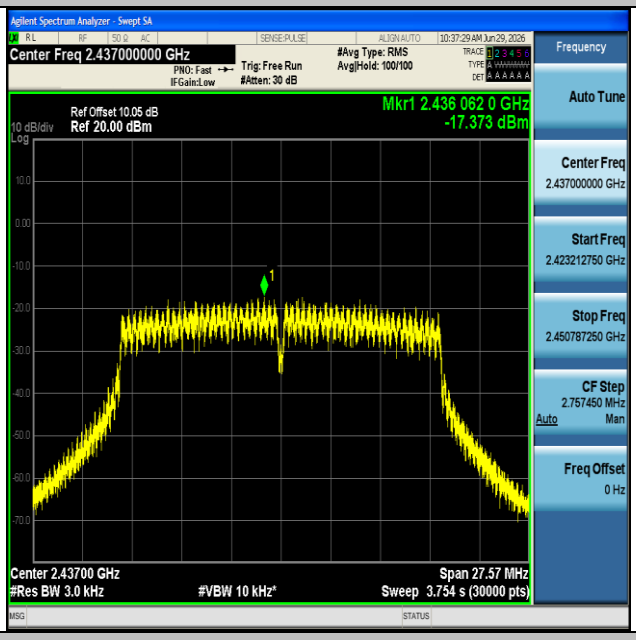
11G-Ant1-2437-PASS



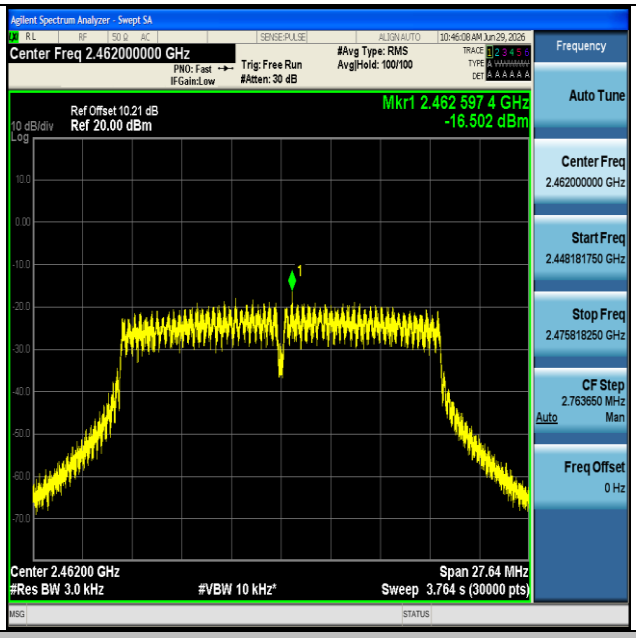
11G-Ant1-2462-PASS



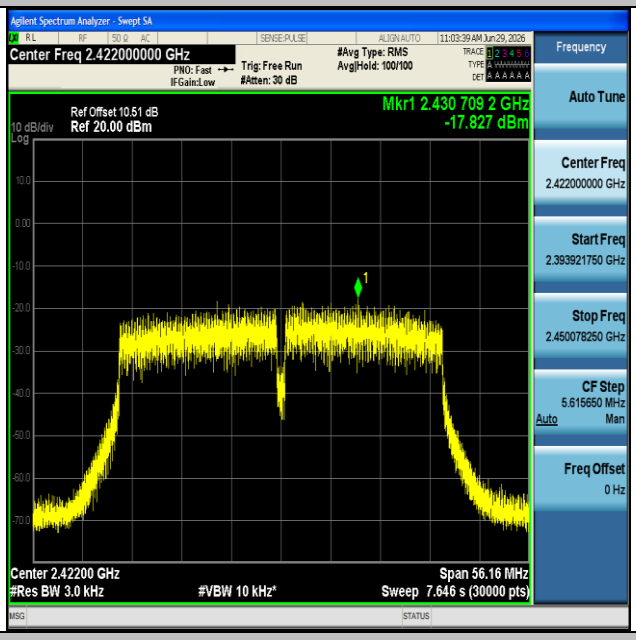
11N20SISO-Ant1-2412-PASS



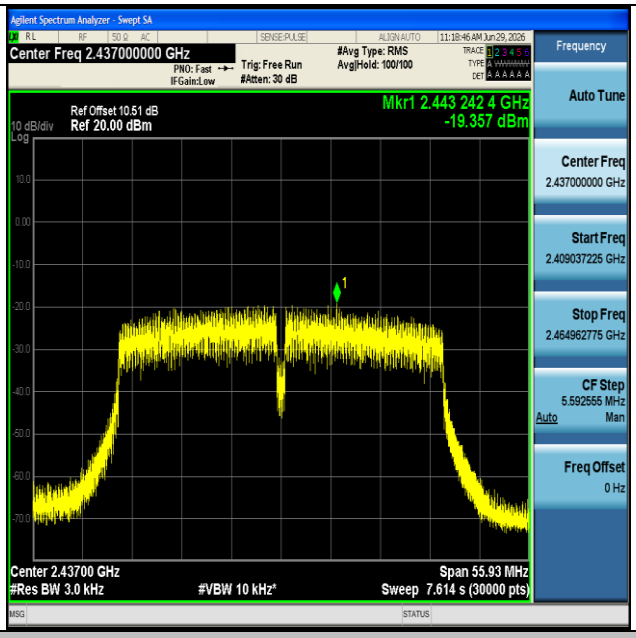
11N20SISO-Ant1-2437-PASS



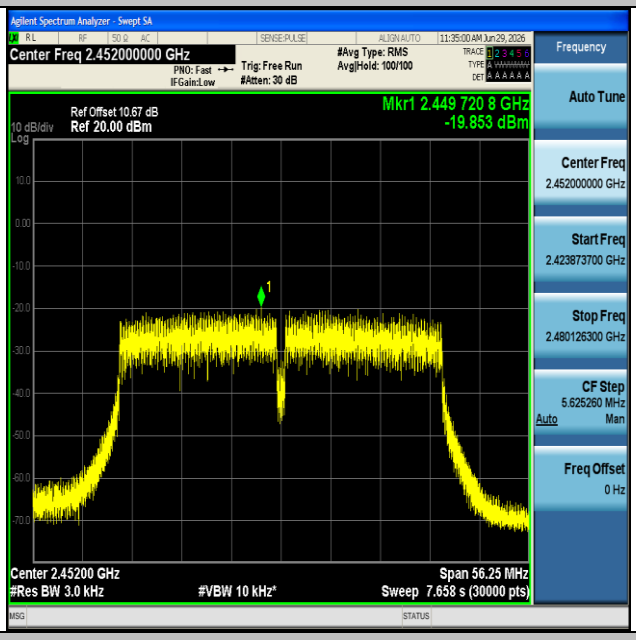
11N20SISO-Ant1-2462-PASS



11N40SISO-Ant1-2422-PASS



11N40SISO-Ant1-2437-PASS



11N40SISO-Ant1-2452-PASS

Appendix E: Band edge measurements

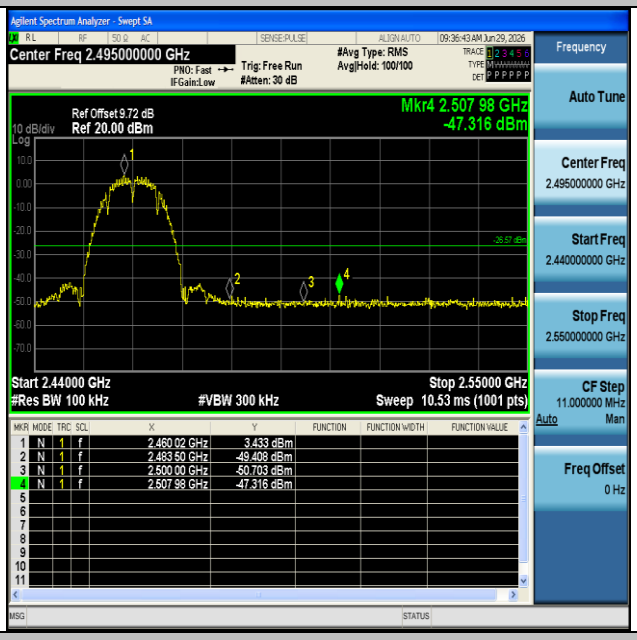
Test Result

Test Mode	Antenna	Ch. Name	Frequency.[MHz]	Ref. Level [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	Low	2412	3.55	-42.01	≤-26.45	PASS
11B	Ant1	High	2462	3.43	-47.32	≤-26.57	PASS
11G	Ant1	Low	2412	2.31	-35.97	≤-27.69	PASS
11G	Ant1	High	2462	2.61	-48.07	≤-27.39	PASS
11N20SISO	Ant1	Low	2412	2.19	-34.65	≤-27.81	PASS
11N20SISO	Ant1	High	2462	2.46	-47.47	≤-27.54	PASS
11N40SISO	Ant1	Low	2422	0.60	-38.98	≤-29.4	PASS
11N40SISO	Ant1	High	2452	-0.60	-46	≤-30.6	PASS

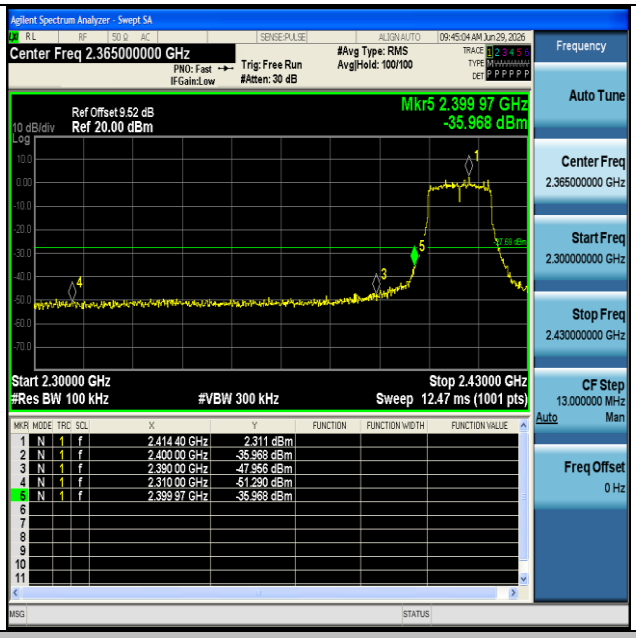
Note: offset(dB) = cable loss(dB) + attenuator factor(dB)

Test Graphs

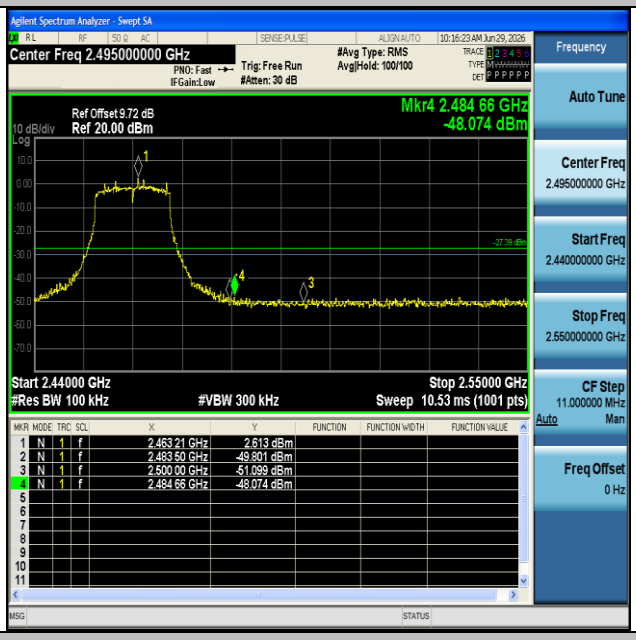
11B-Ant1-2412-PASS



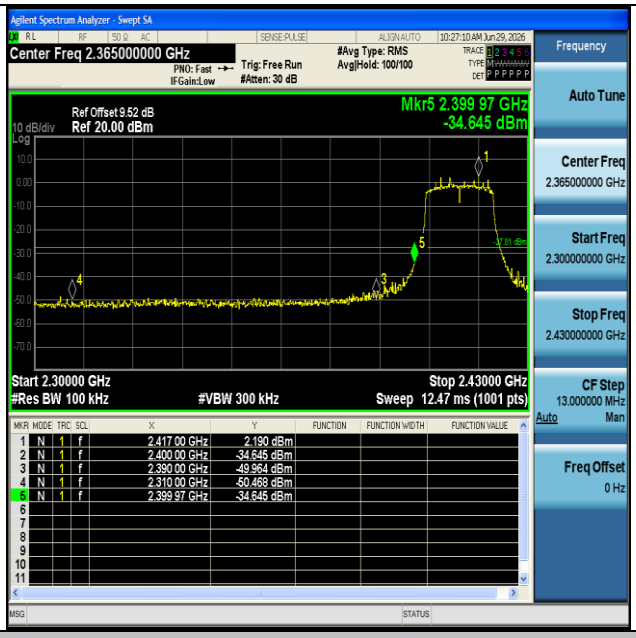
11B-Ant1-2462-PASS



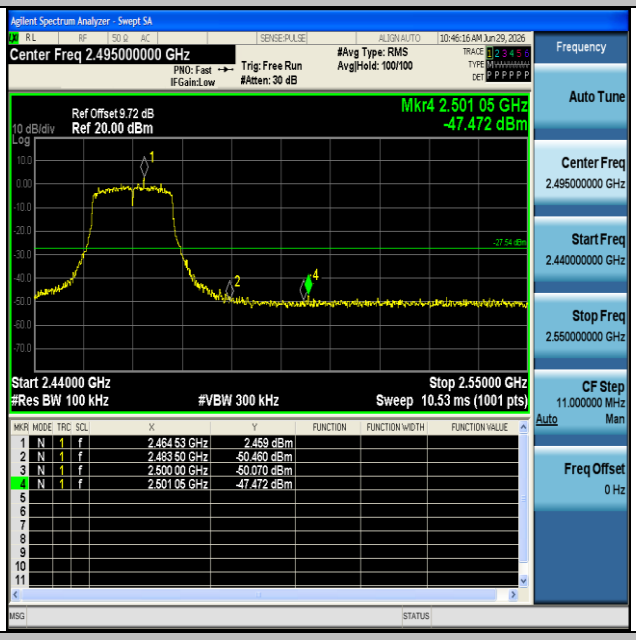
11G-Ant1-2412-PASS



11G-Ant1-2462-PASS



11N20SISO-Ant1-2412-PASS



11N20SISO-Ant1-2462-PASS

11N40SISO-Ant1-2422-PASS

11N40SISO-Ant1-2452-PASS

Appendix F: Conducted Spurious Emission

Test Result

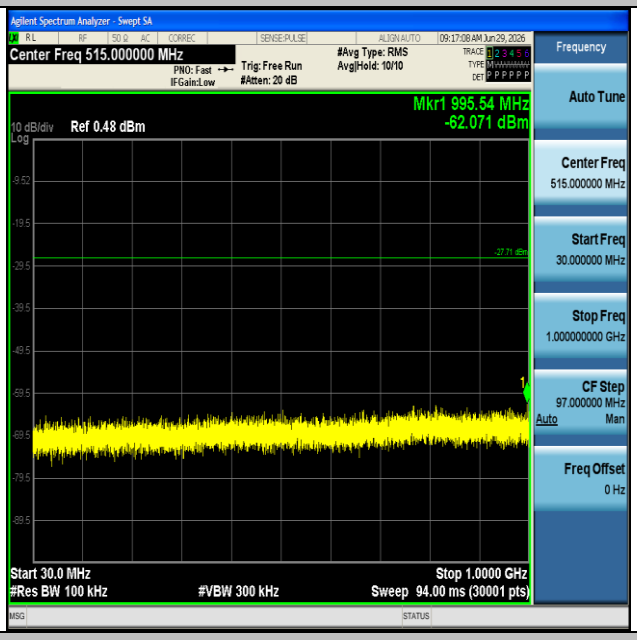
Test Mode	Antenna	Frequency [MHz]	Freq. Range [Mhz]	Ref. Level [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	0~Reference	2.29	2.29	---	PASS
11B	Ant1	2412	30~1000	2.29	-62.07	≤-27.71	PASS
11B	Ant1	2412	1000~26500	2.29	-37.23	≤-27.71	PASS
11B	Ant1	2437	0~Reference	2.75	2.75	---	PASS
11B	Ant1	2437	30~1000	2.75	-62.14	≤-27.25	PASS
11B	Ant1	2437	1000~26500	2.75	-37.28	≤-27.25	PASS
11B	Ant1	2462	0~Reference	3.32	3.32	---	PASS
11B	Ant1	2462	30~1000	3.32	-62.44	≤-26.68	PASS
11B	Ant1	2462	1000~26500	3.32	-36.95	≤-26.68	PASS
11G	Ant1	2412	0~Reference	1.61	1.61	---	PASS
11G	Ant1	2412	30~1000	1.61	-62.31	≤-28.39	PASS
11G	Ant1	2412	1000~26500	1.61	-37.57	≤-28.39	PASS
11G	Ant1	2437	0~Reference	1.83	1.83	---	PASS
11G	Ant1	2437	30~1000	1.83	-62.02	≤-28.17	PASS
11G	Ant1	2437	1000~26500	1.83	-36.52	≤-28.17	PASS
11G	Ant1	2462	0~Reference	2.28	2.28	---	PASS
11G	Ant1	2462	30~1000	2.28	-63.11	≤-27.72	PASS
11G	Ant1	2462	1000~26500	2.28	-37.73	≤-27.72	PASS
11N20SISO	Ant1	2412	0~Reference	2.15	2.15	---	PASS
11N20SISO	Ant1	2412	30~1000	2.15	-61.97	≤-27.85	PASS
11N20SISO	Ant1	2412	1000~26500	2.15	-38.1	≤-27.85	PASS
11N20SISO	Ant1	2437	0~Reference	1.49	1.49	---	PASS
11N20SISO	Ant1	2437	30~1000	1.49	-63.49	≤-28.51	PASS
11N20SISO	Ant1	2437	1000~26500	1.49	-37.68	≤-28.51	PASS
11N20SISO	Ant1	2462	0~Reference	1.27	1.27	---	PASS
11N20SISO	Ant1	2462	30~1000	1.27	-63.02	≤-28.73	PASS
11N20SISO	Ant1	2462	1000~26500	1.27	-38.26	≤-28.73	PASS
11N40SISO	Ant1	2422	0~Reference	0.91	0.91	---	PASS
11N40SISO	Ant1	2422	30~1000	0.91	-61.91	≤-29.09	PASS
11N40SISO	Ant1	2422	1000~26500	0.91	-37.33	≤-29.09	PASS
11N40SISO	Ant1	2437	0~Reference	-1.73	-1.73	---	PASS
11N40SISO	Ant1	2437	30~1000	-1.73	-61.18	≤-31.73	PASS
11N40SISO	Ant1	2437	1000~26500	-1.73	-36.37	≤-31.73	PASS
11N40SISO	Ant1	2452	0~Reference	-1.61	-1.61	---	PASS
11N40SISO	Ant1	2452	30~1000	-1.61	-61.92	≤-31.61	PASS
11N40SISO	Ant1	2452	1000~26500	-1.61	-36.57	≤-31.61	PASS

Note: offset(dB) in Reference test plots = cable loss(dB) + attenuator factor(dB); For spurious emissions plots from 30MHz to 26.5GHz, the cable loss and attenuator factors have been set in the 'Input Correction' of

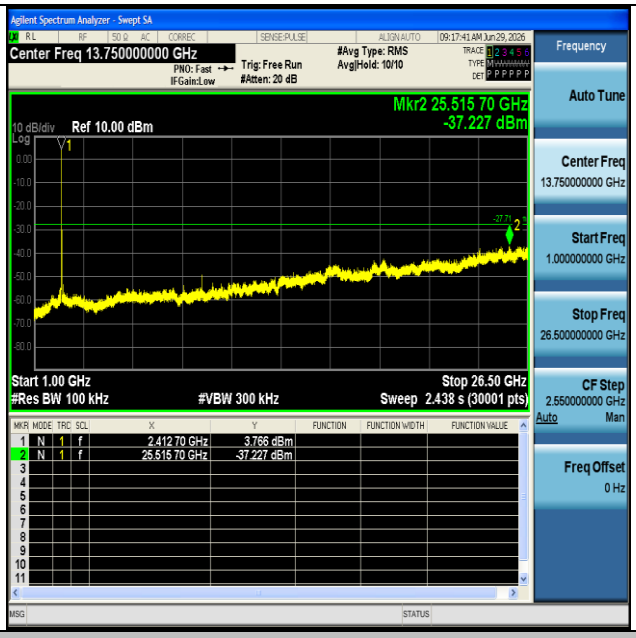
the Spectrum Analyzer during the test.

Test Graphs

11B-Ant1-2412-0~Reference-PASS

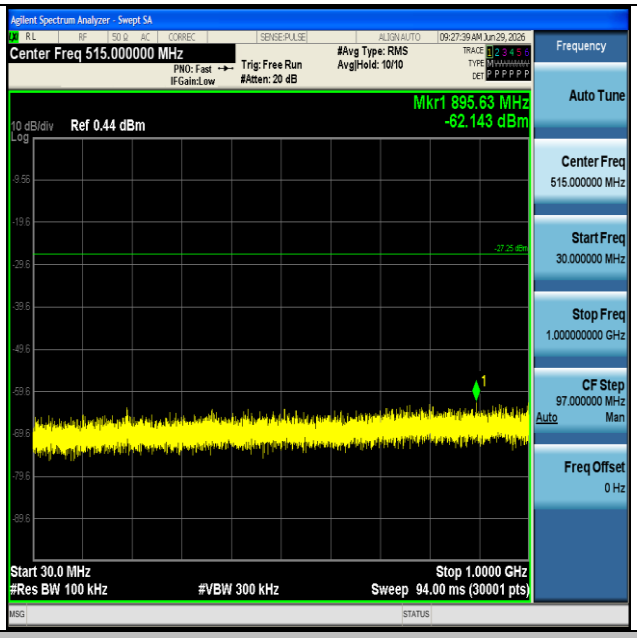


11B-Ant1-2412-30~1000-PASS

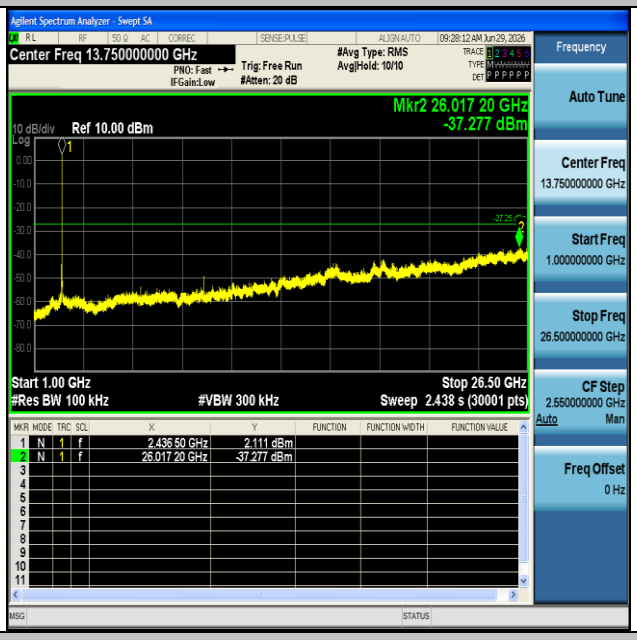


11B-Ant1-2412-1000~26500-PASS

11B-Ant1-2437-0~Reference-PASS

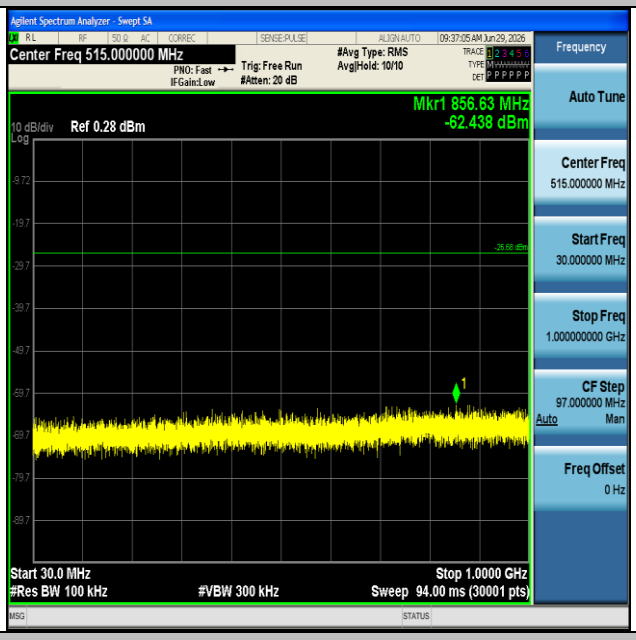


11B-Ant1-2437-30~1000-PASS

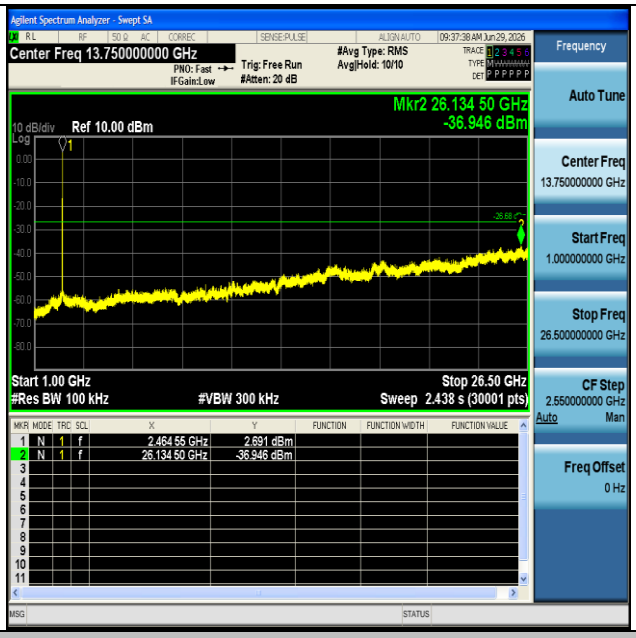


11B-Ant1-2437-1000~26500-PASS

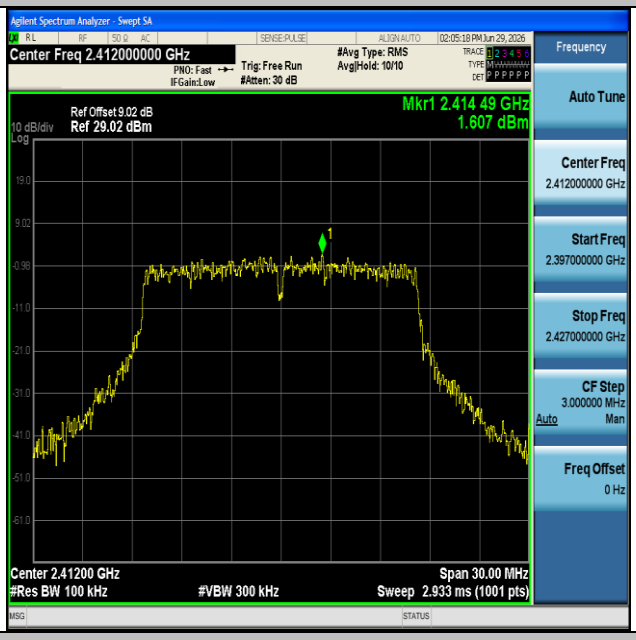
11B-Ant1-2462-0~Reference-PASS



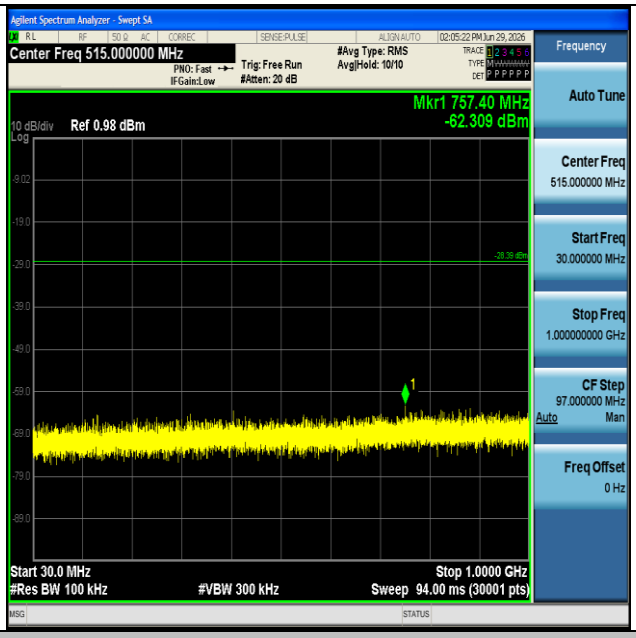
11B-Ant1-2462-30~1000-PASS



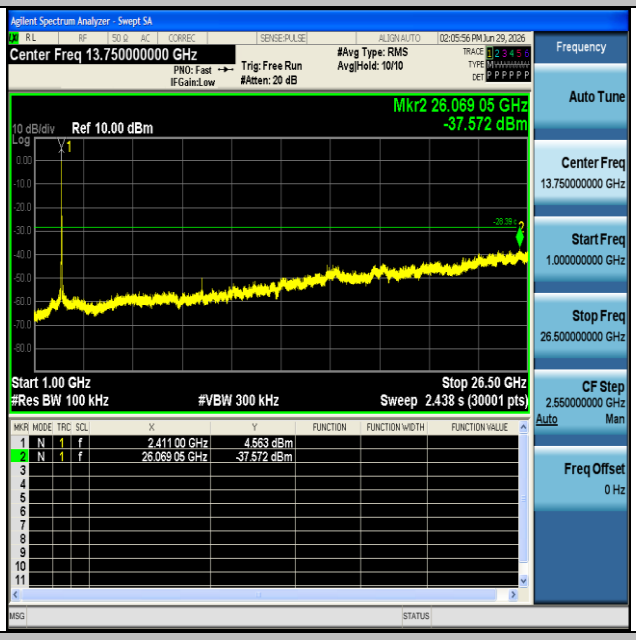
11B-Ant1-2462-1000~26500-PASS



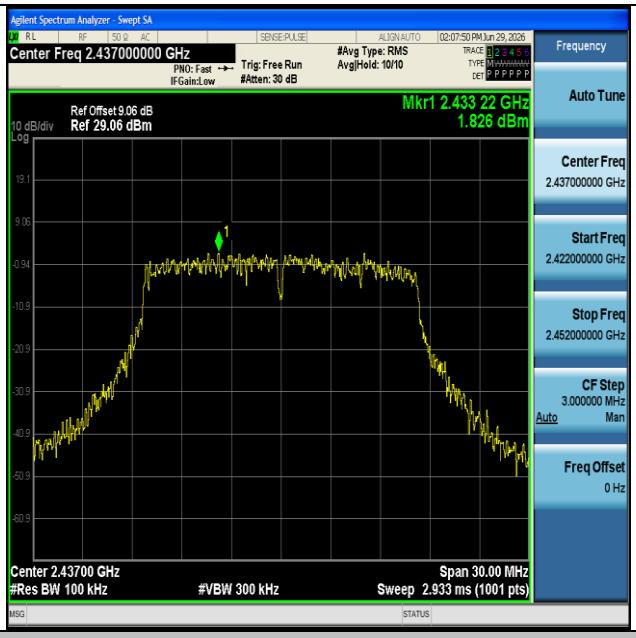
11G-Ant1-2412-0~Reference-PASS



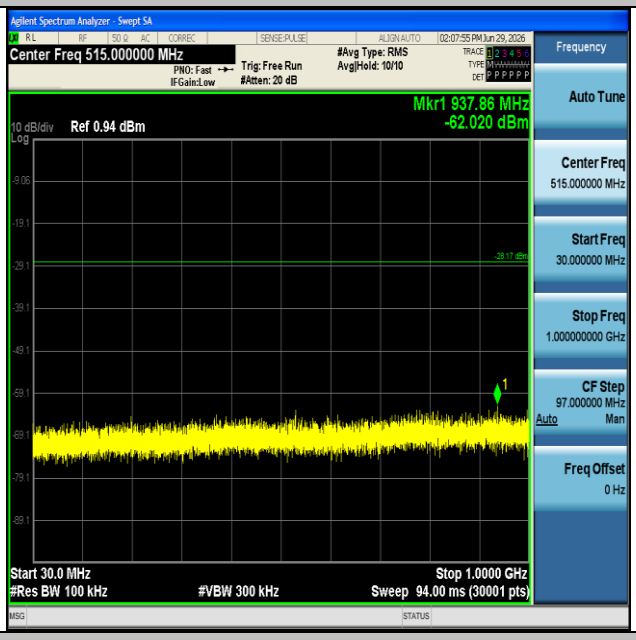
11G-Ant1-2412-30~1000-PASS



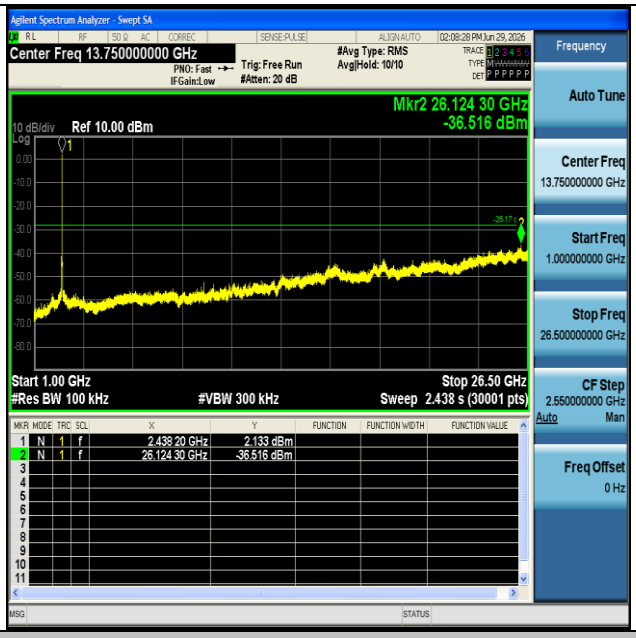
11G-Ant1-2412-1000~26500-PASS



11G-Ant1-2437-0~Reference-PASS

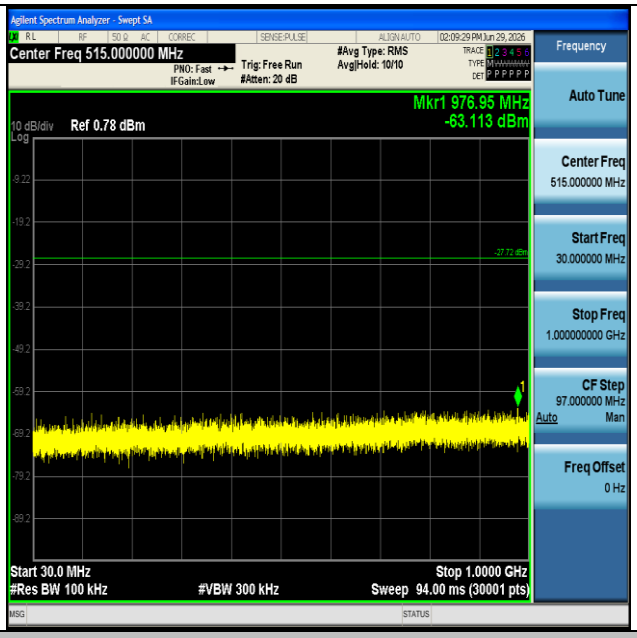


11G-Ant1-2437-30~1000-PASS

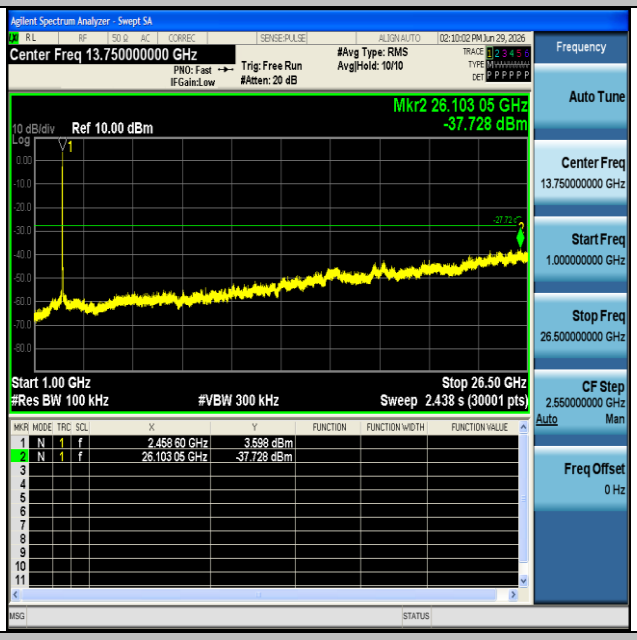


11G-Ant1-2437-1000~26500-PASS

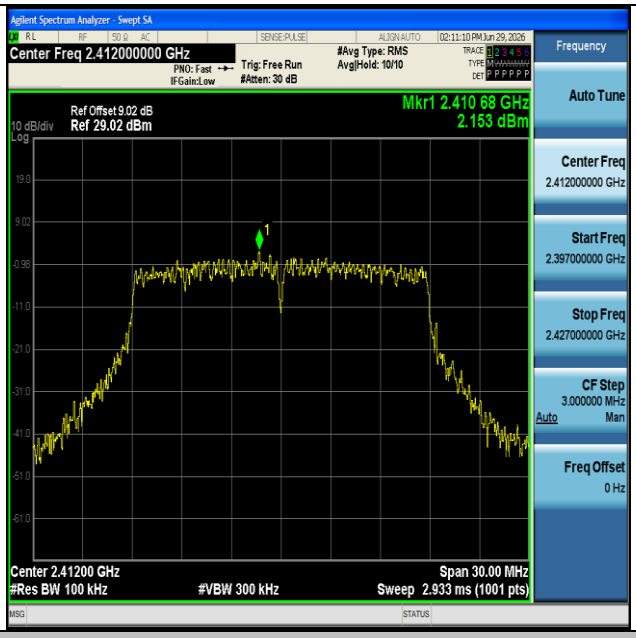
11G-Ant1-2462-0~Reference-PASS



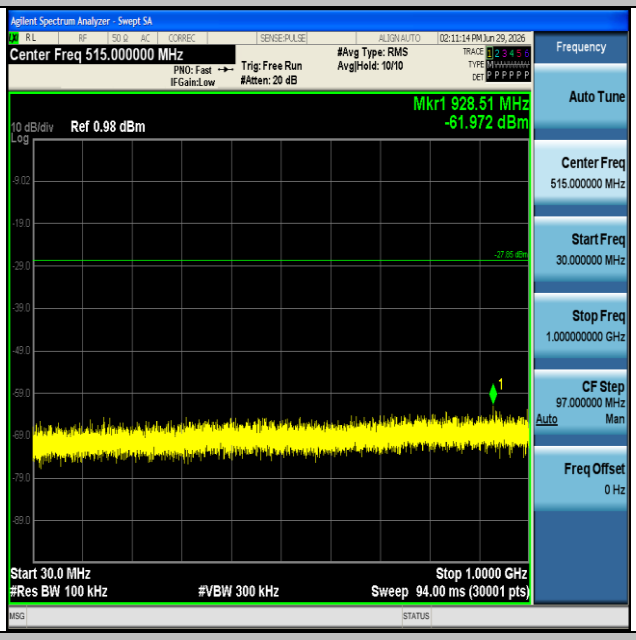
11G-Ant1-2462-30~1000-PASS



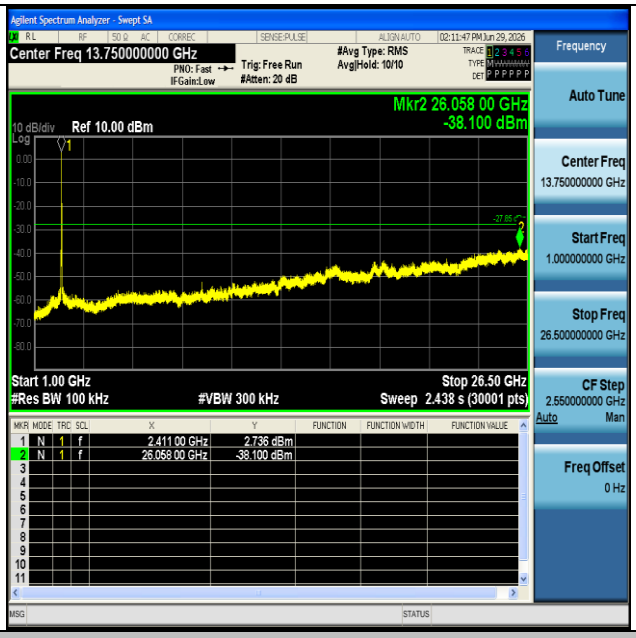
11G-Ant1-2462-1000~26500-PASS



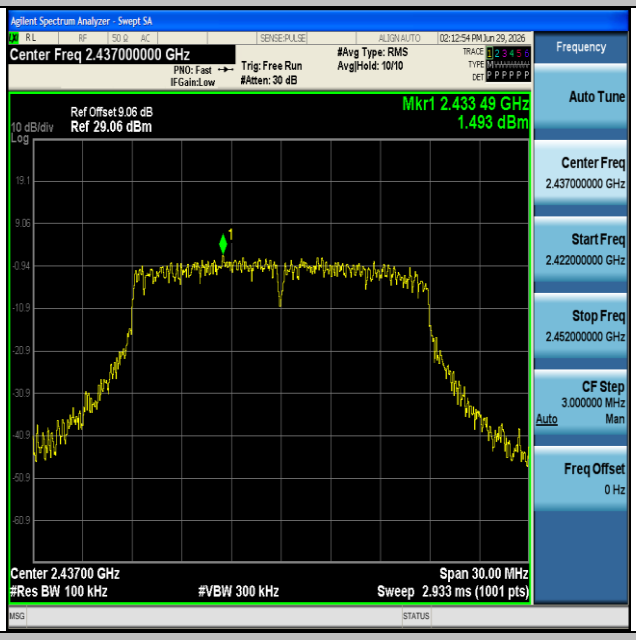
11N20SISO-Ant1-2412-0~Reference-PASS



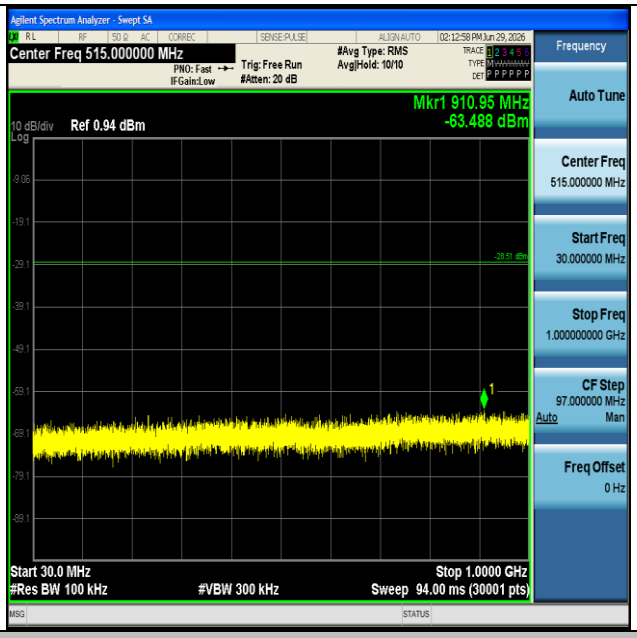
11N20SISO-Ant1-2412-30~1000-PASS



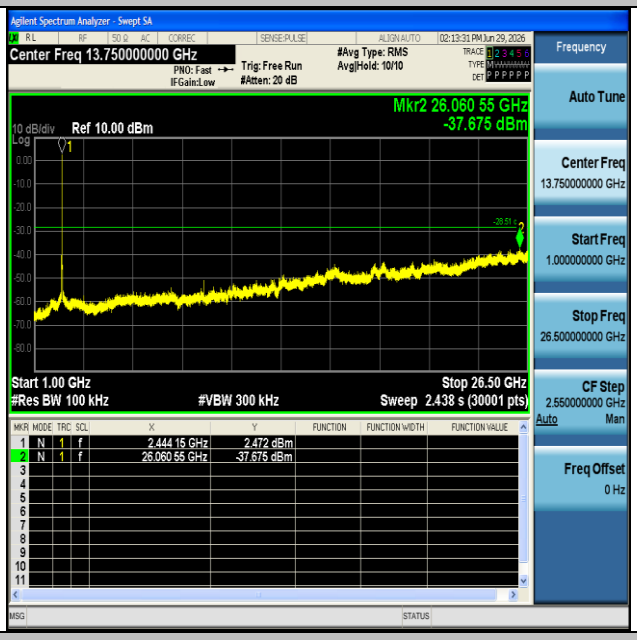
11N20SISO-Ant1-2412-1000~26500-PASS



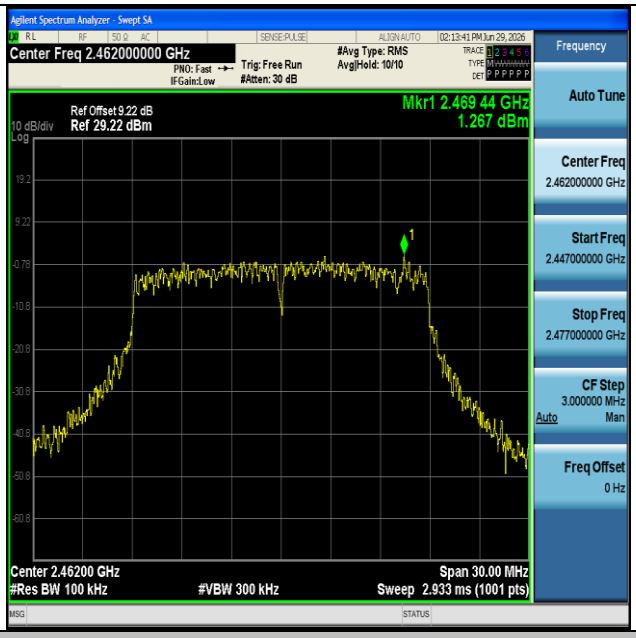
11N20SISO-Ant1-2437-0~Reference-PASS



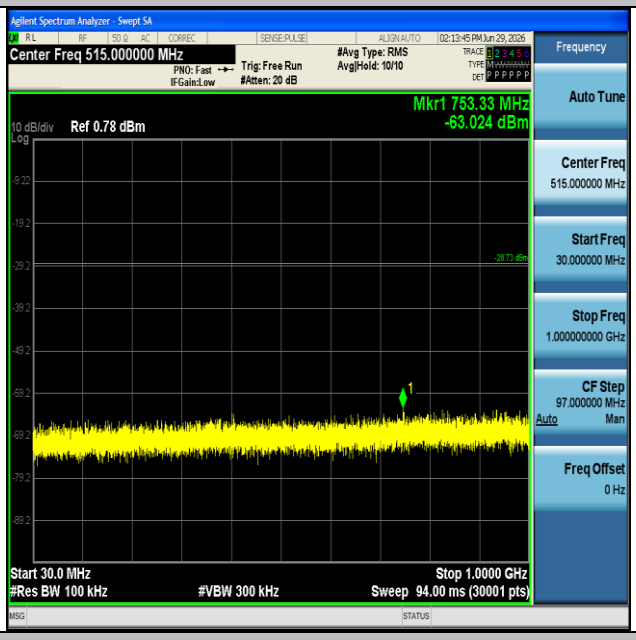
11N20SISO-Ant1-2437-30~1000-PASS



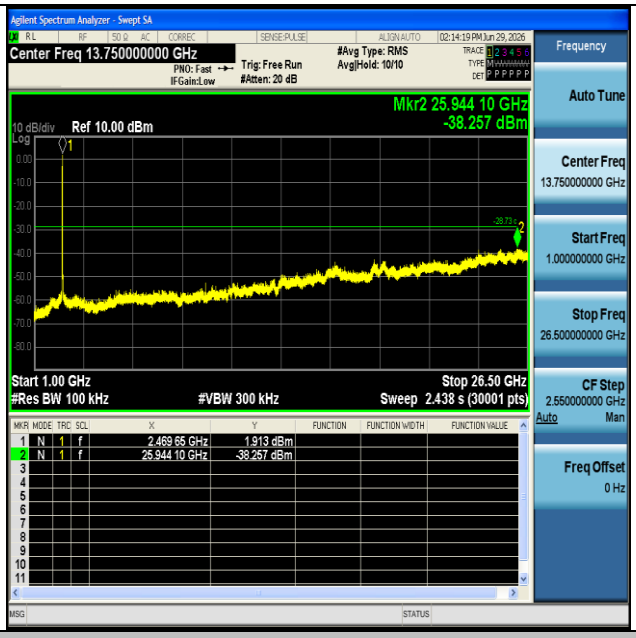
11N20SISO-Ant1-2437-1000~26500-PASS



11N20SISO-Ant1-2462-0~Reference-PASS

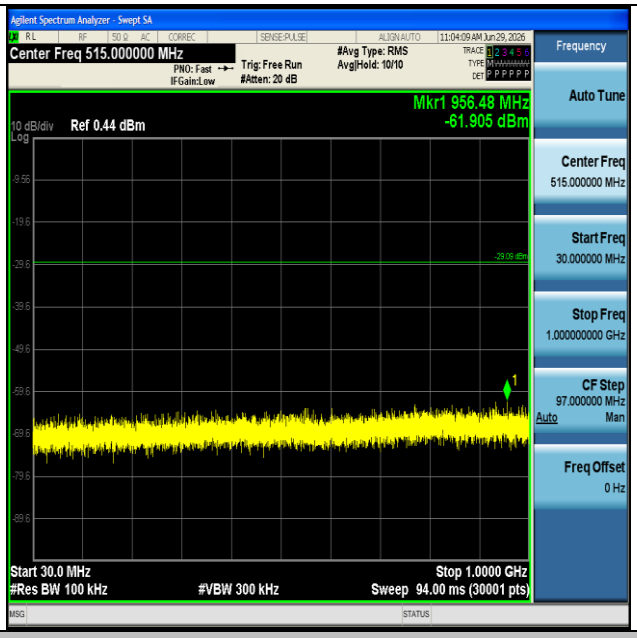


11N20SISO-Ant1-2462-30~1000-PASS

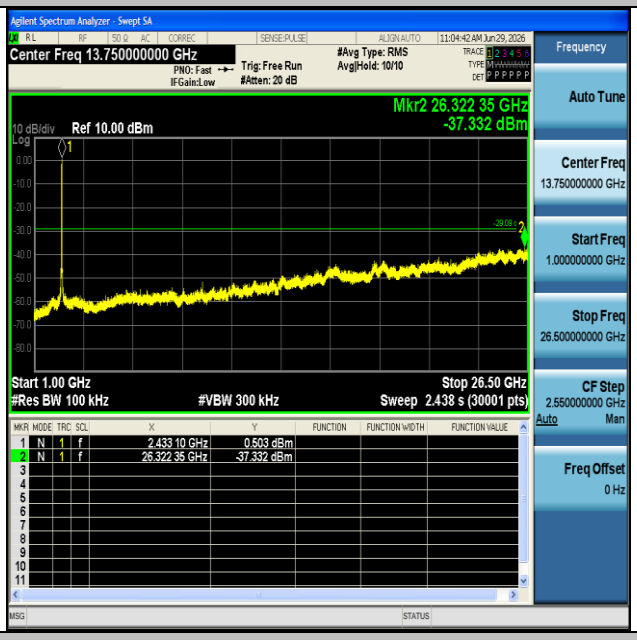


11N20SISO-Ant1-2462-1000~26500-PASS

11N40SISO-Ant1-2422-0~Reference-PASS



11N40SISO-Ant1-2422-30~1000-PASS



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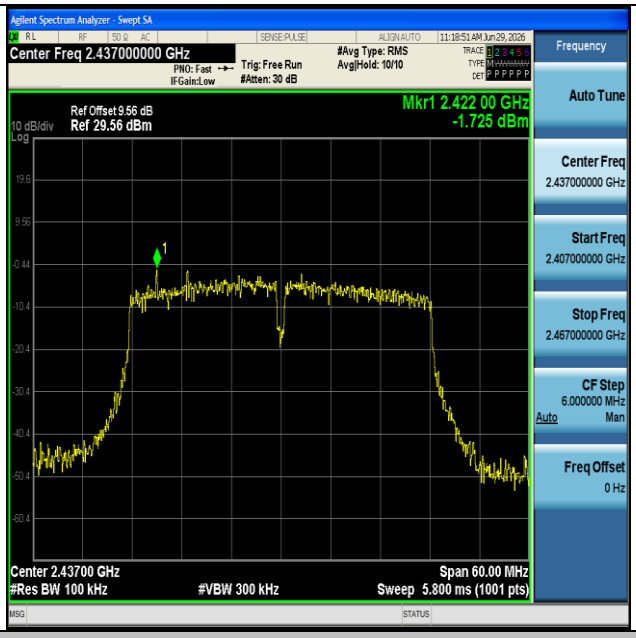
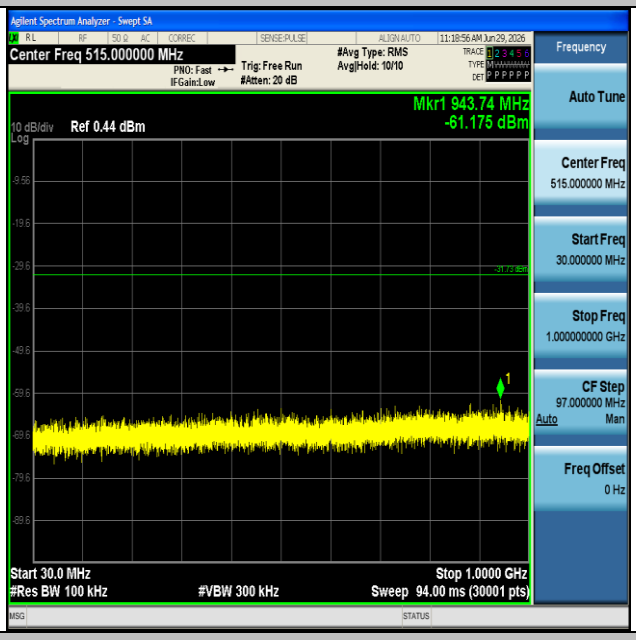
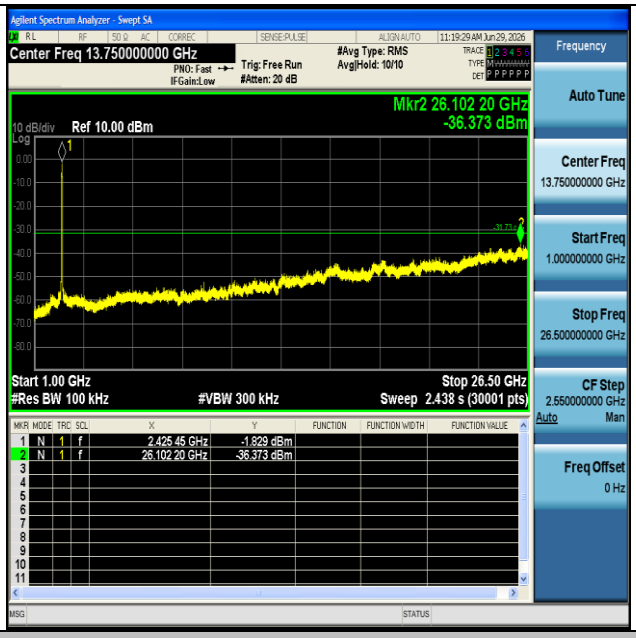


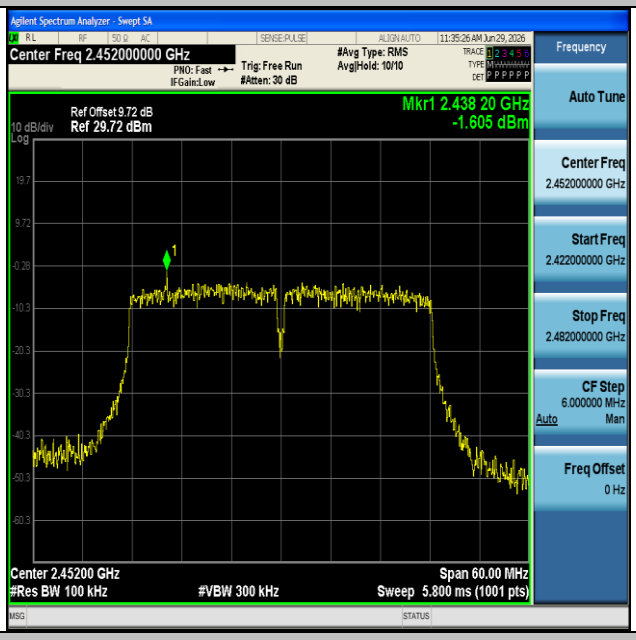
11N40SISO-Ant1-2437-0~Reference-PASS



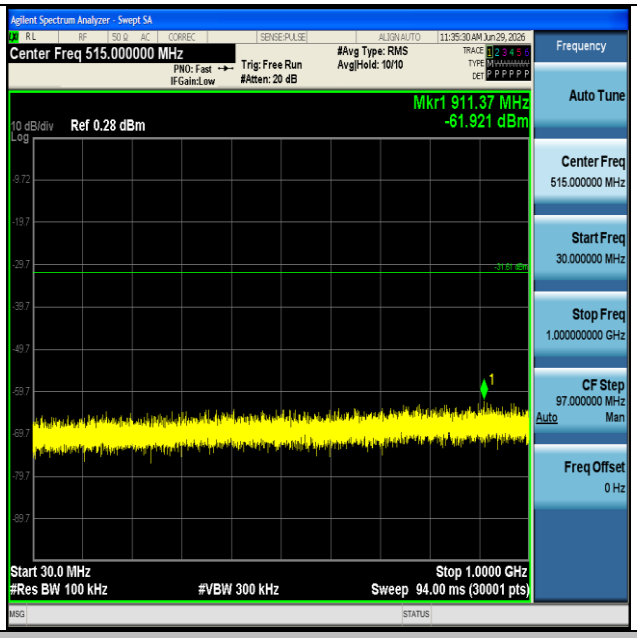
11N40SISO-Ant1-2437-30~1000-PASS



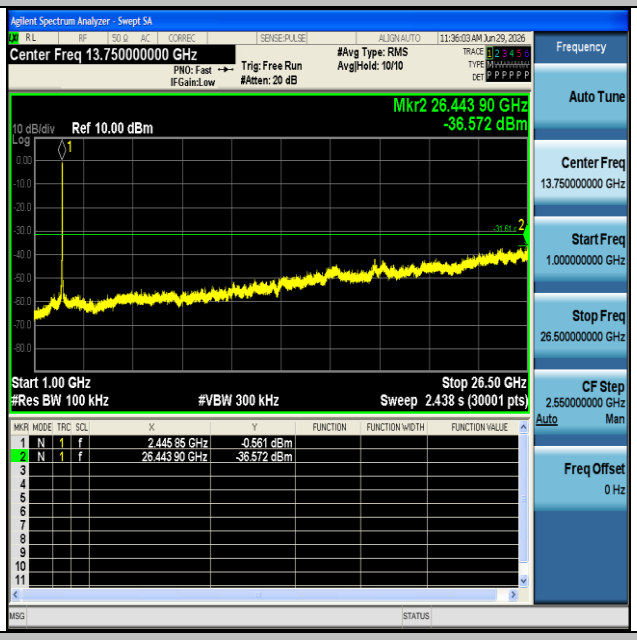
11N40SISO-Ant1-2437-1000~26500-PASS



11N40SISO-Ant1-2452-0~Reference-PASS



11N40SISO-Ant1-2452-30~1000-PASS



11N40SISO-Ant1-2452-1000~26500-PASS

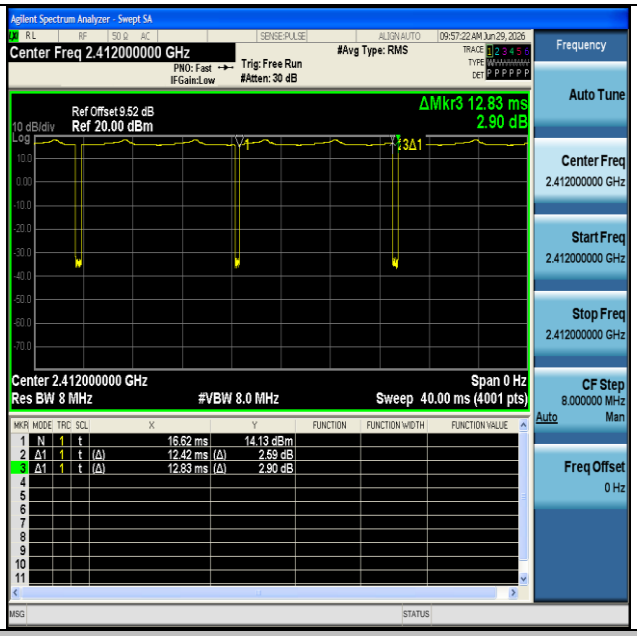
Appendix G: Duty Cycle

Test Result

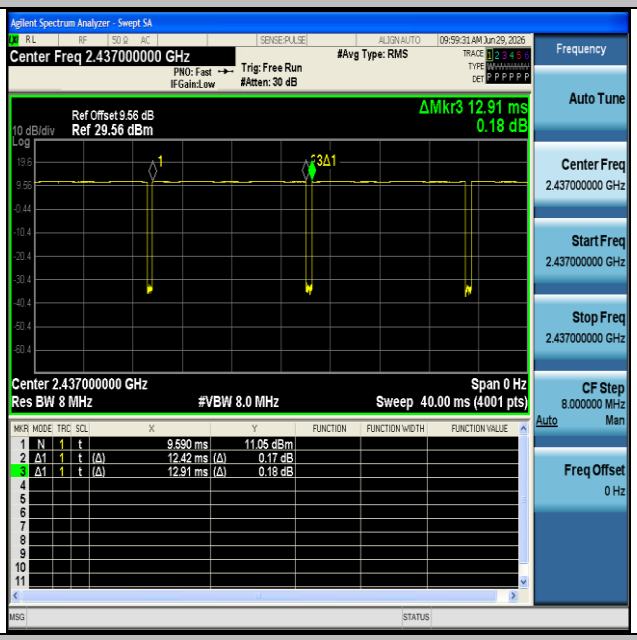
Test Mode	Antenna	Frequency [MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Factor
11B	Ant1	2412	12.42	12.83	96.80	0.14
11B	Ant1	2437	12.42	12.91	96.20	0.17
11B	Ant1	2462	12.42	12.86	96.58	0.15
11G	Ant1	2412	2.06	2.29	89.96	0.46
11G	Ant1	2437	2.06	2.28	90.35	0.44
11G	Ant1	2462	2.06	2.29	89.96	0.46
11N20SISO	Ant1	2412	1.92	2.15	89.30	0.49
11N20SISO	Ant1	2437	1.92	2.15	89.30	0.49
11N20SISO	Ant1	2462	1.92	2.15	89.30	0.49
11N40SISO	Ant1	2422	0.94	1.17	80.34	0.95
11N40SISO	Ant1	2437	0.94	1.17	80.34	0.95
11N40SISO	Ant1	2452	0.94	1.17	80.34	0.95

Note: offset(dB) = cable loss(dB) + attenuator factor(dB)

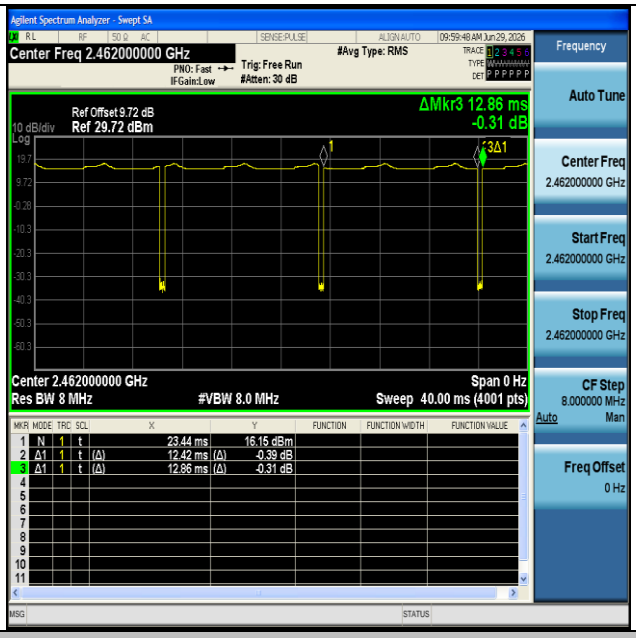
Test Graphs



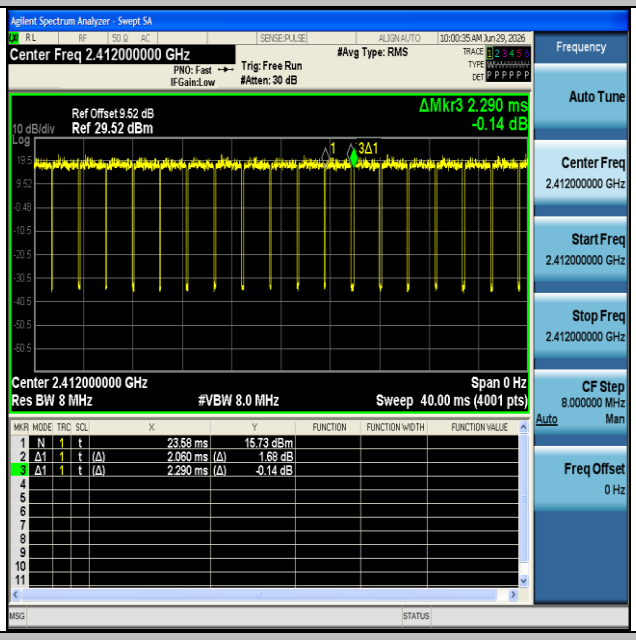
NTNV-11B-Ant1-2412



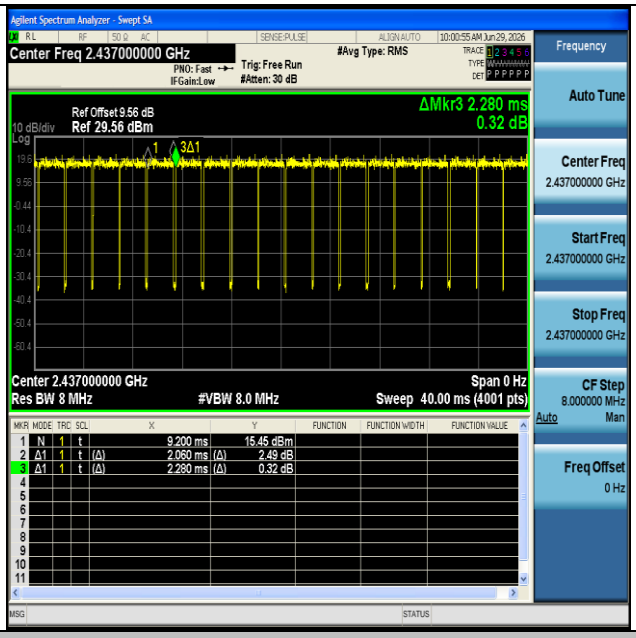
NTNV-11B-Ant1-2437



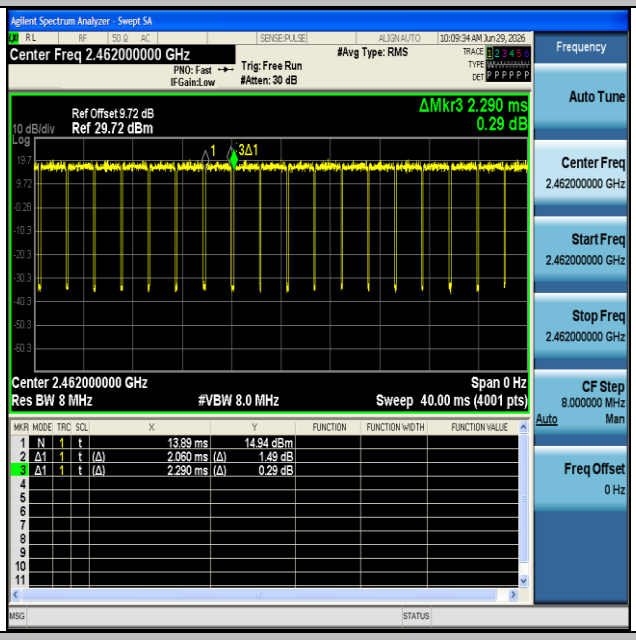
NTNV-11B-Ant1-2462



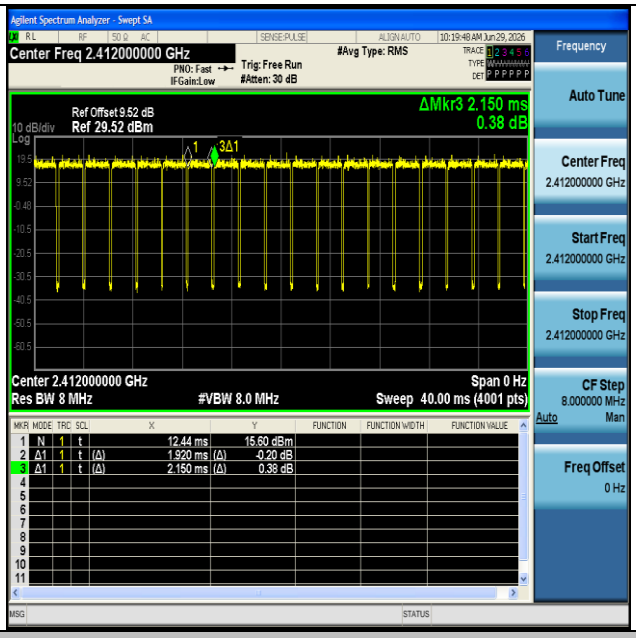
NTNV-11G-Ant1-2412



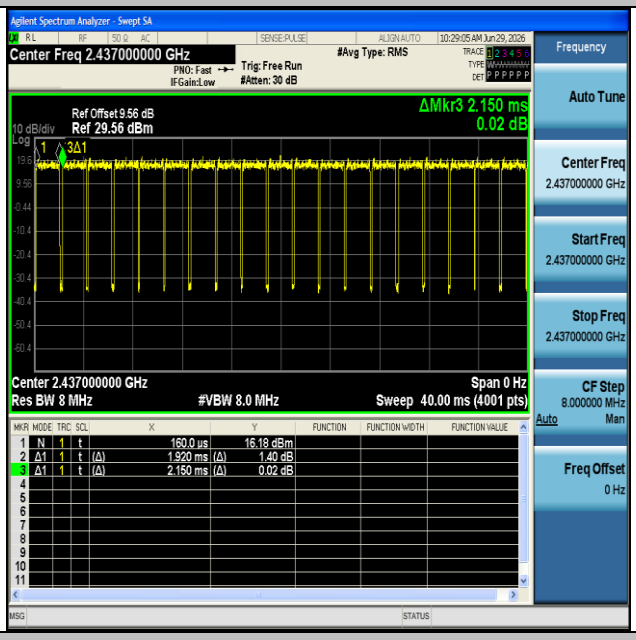
NTNV-11G-Ant1-2437



NTNV-11G-Ant1-2462



NTNV-11N20SISO-Ant1-2412



NTNV-11N20SISO-Ant1-2437