

Appendix Test Data for WLAN(2.4G) (Conducted Measurement)

Product Name: WIFI TOUCH SCREEN KARAOKE SYSTEM

Trade Mark: Singing Machine

Test Model: ISM9015

FCC ID: 2AAXO-ISM9015

Environmental Conditions

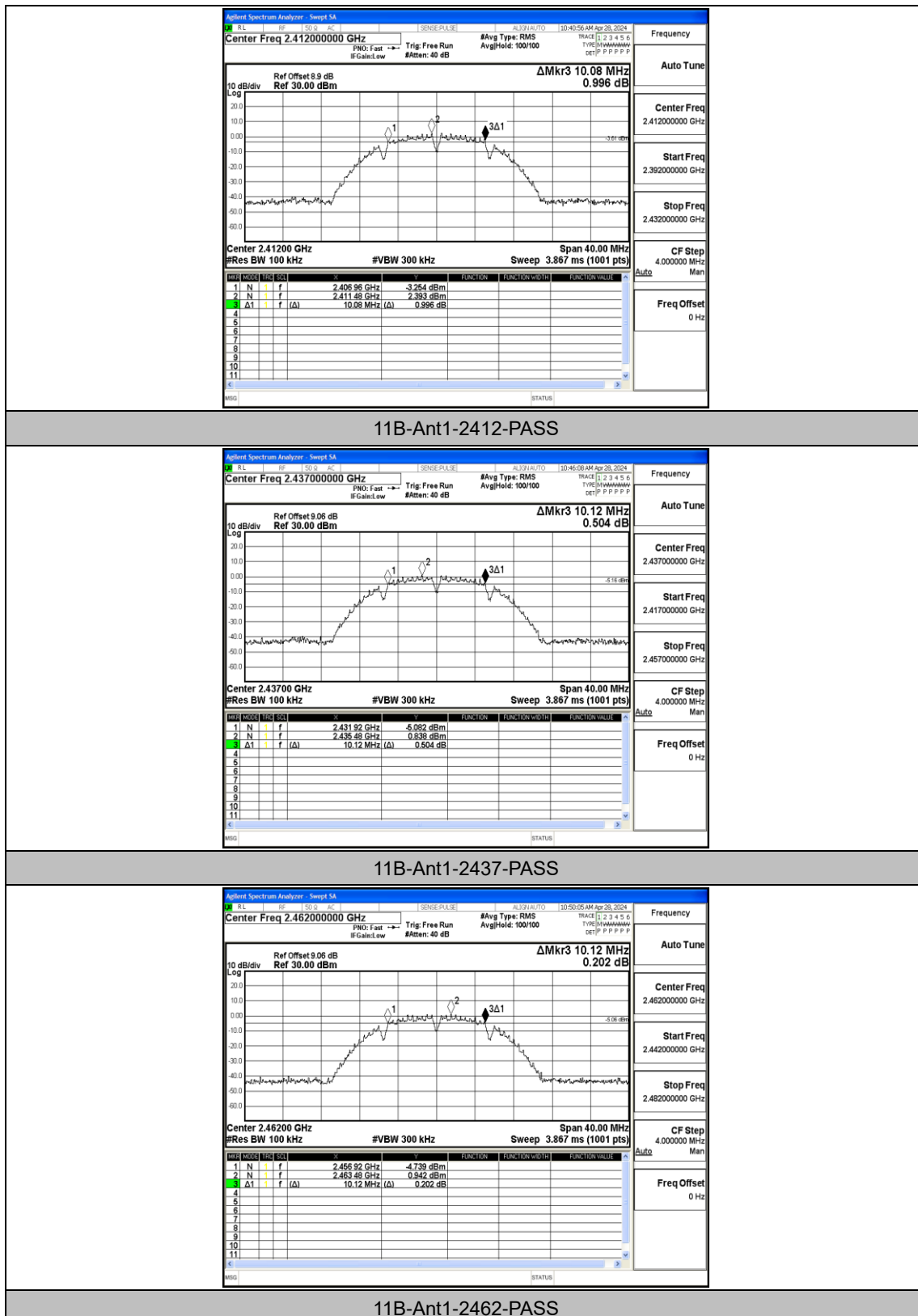
Temperature:	23.8℃
Relative Humidity:	58%
ATM Pressure:	100.0 kPa
Test Engineer:	Allen Lai
Supervised by:	Hugo Chen
NOTE	N/A

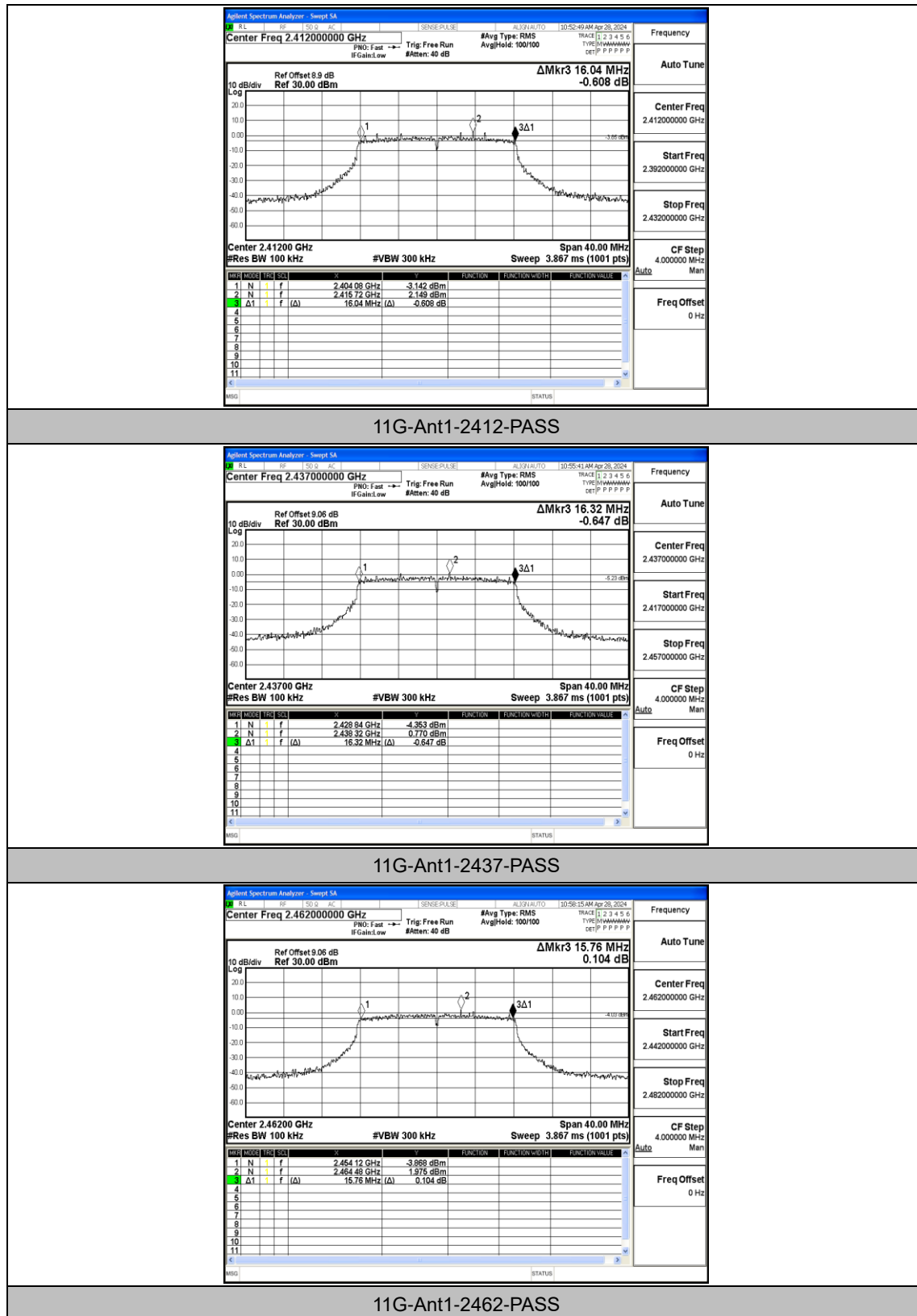
Appendix A: DTS Bandwidth

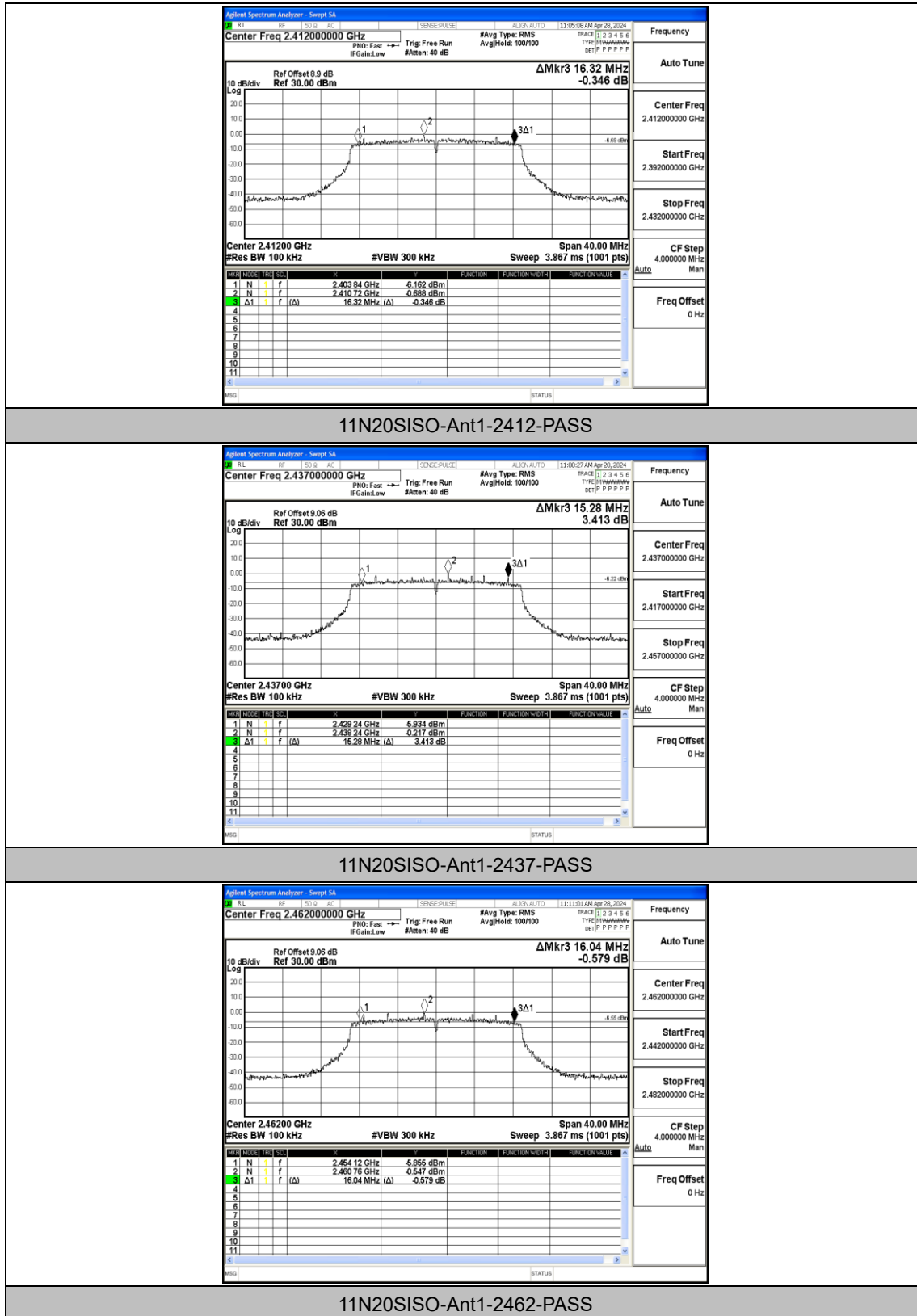
Test Result

TestMode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	10.080	2406.960	2417.040	0.5	PASS
11B	Ant1	2437	10.120	2431.920	2442.040	0.5	PASS
11B	Ant1	2462	10.120	2456.920	2467.040	0.5	PASS
11G	Ant1	2412	16.040	2404.080	2420.120	0.5	PASS
11G	Ant1	2437	16.320	2428.840	2445.160	0.5	PASS
11G	Ant1	2462	15.760	2454.120	2469.880	0.5	PASS
11N20SISO	Ant1	2412	16.320	2403.840	2420.160	0.5	PASS
11N20SISO	Ant1	2437	15.280	2429.240	2444.520	0.5	PASS
11N20SISO	Ant1	2462	16.040	2454.120	2470.160	0.5	PASS

Test Graphs





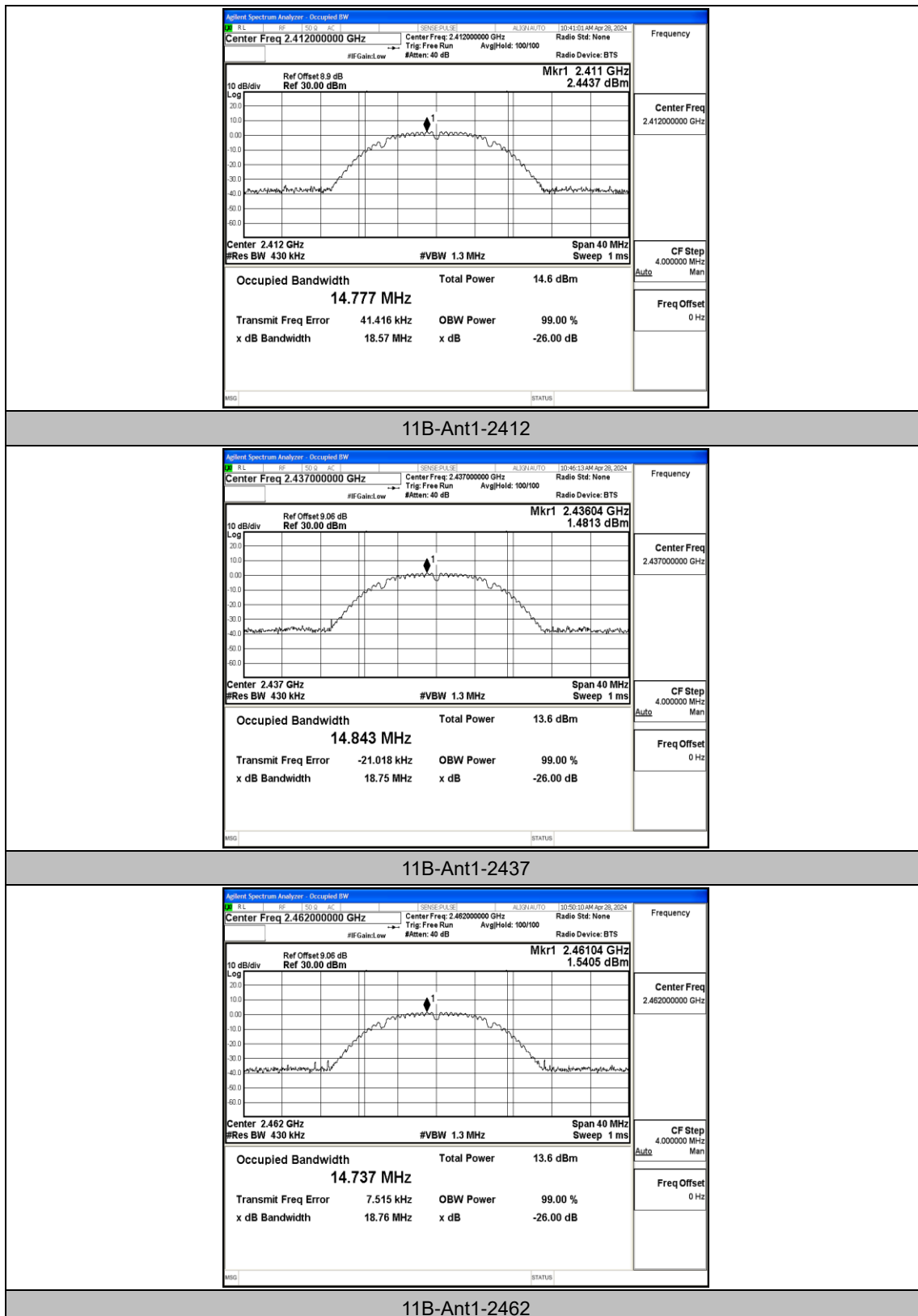


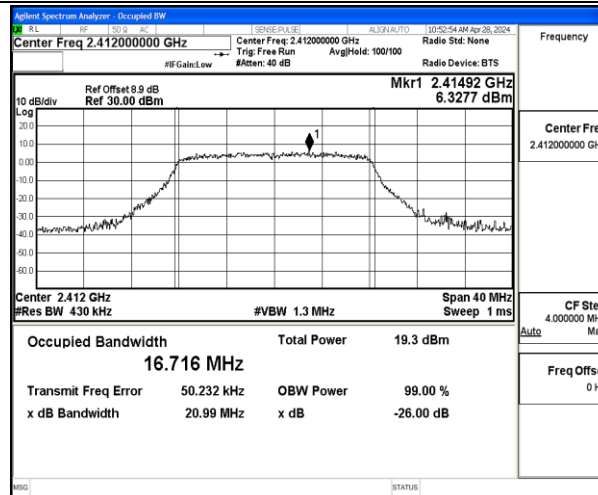
Appendix B: Occupied Channel Bandwidth

Test Result

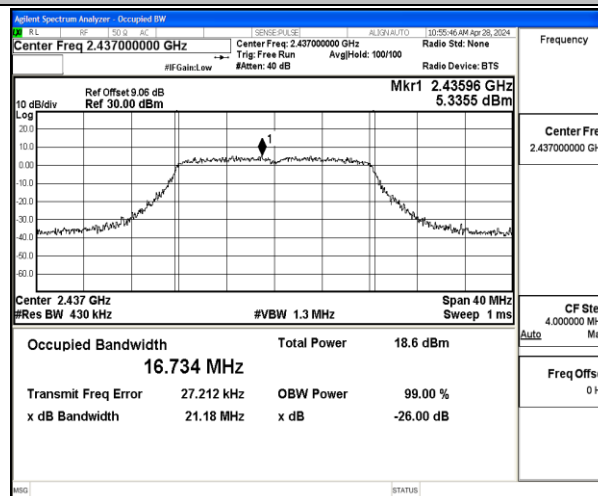
TestMode	Antenna	Channel Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	14.777	2404.6529	2419.4299	---	---
11B	Ant1	2437	14.843	2429.5575	2444.4005	---	---
11B	Ant1	2462	14.737	2454.6390	2469.3760	---	---
11G	Ant1	2412	16.716	2403.6922	2420.4082	---	---
11G	Ant1	2437	16.734	2428.6602	2445.3942	---	---
11G	Ant1	2462	16.695	2453.7060	2470.4010	---	---
11N20SISO	Ant1	2412	17.897	2403.0808	2420.9778	---	---
11N20SISO	Ant1	2437	17.844	2428.0729	2445.9169	---	---
11N20SISO	Ant1	2462	17.830	2453.1139	2470.9439	---	---

Test Graphs

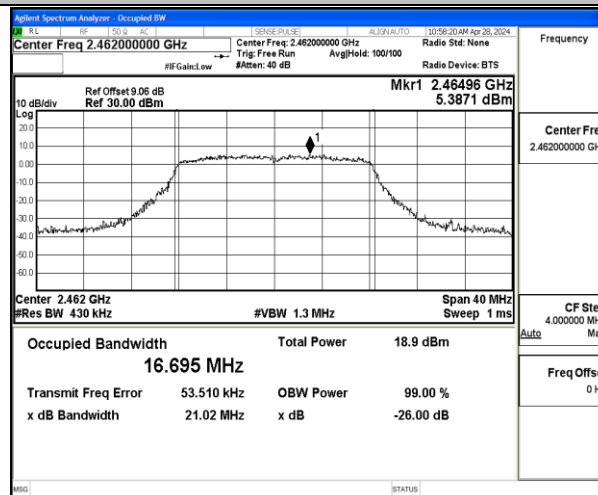




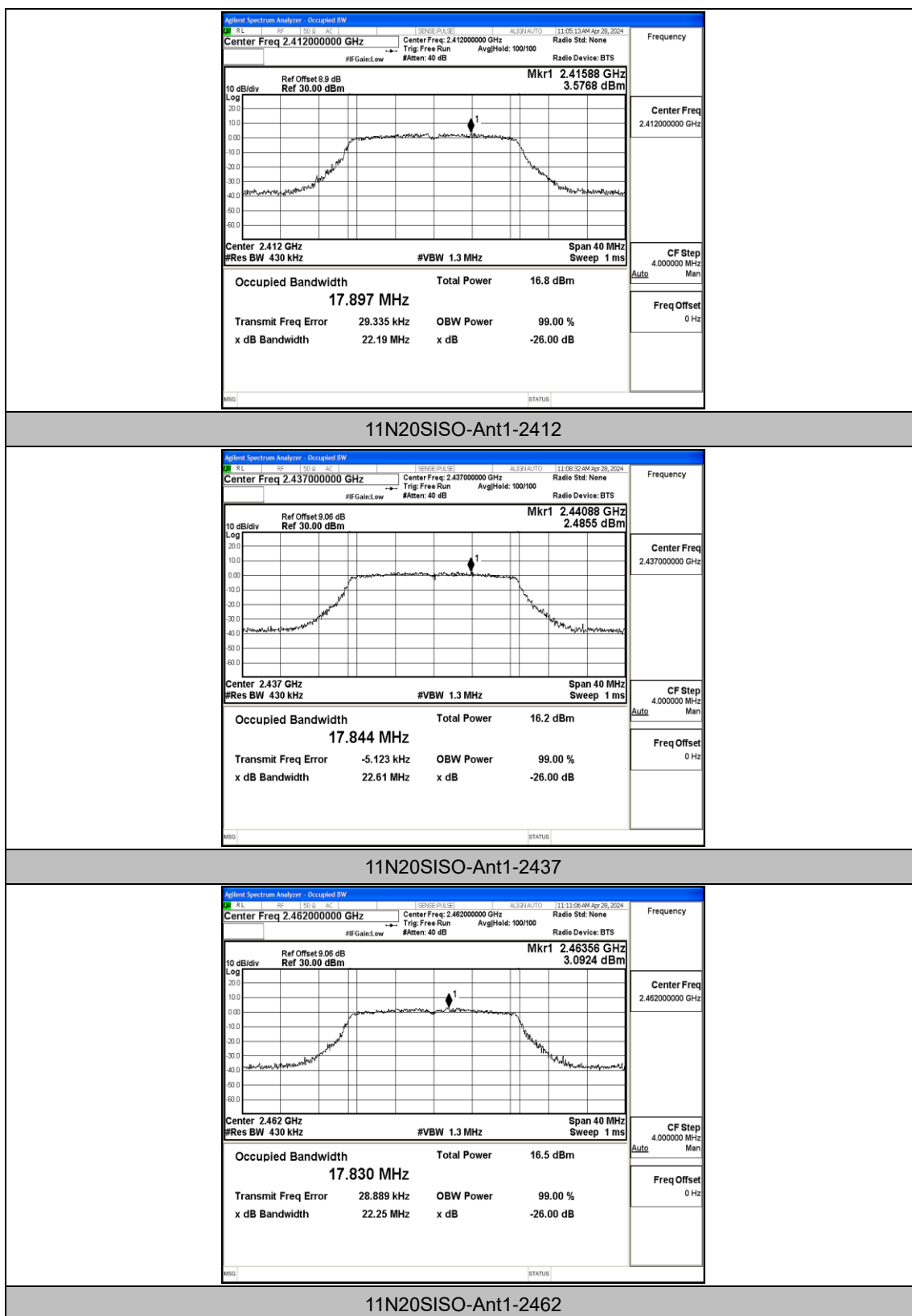
11G-Ant1-2412



11G-Ant1-2437



11G-Ant1-2462



Appendix C: Maximum Average conducted output power

Test Result

TestMode	Antenna	Frequency[MHz]	Conducted Peak Power[dBm]	Conducted Limit[dBm]	Verdict
11B	Ant1	2412	11.66	≤30.00	PASS
11B	Ant1	2437	10.66	≤30.00	PASS
11B	Ant1	2462	10.50	≤30.00	PASS
11G	Ant1	2412	13.27	≤30.00	PASS
11G	Ant1	2437	12.61	≤30.00	PASS
11G	Ant1	2462	13.07	≤30.00	PASS
11N20SISO	Ant1	2412	10.89	≤30.00	PASS
11N20SISO	Ant1	2437	10.32	≤30.00	PASS
11N20SISO	Ant1	2462	10.51	≤30.00	PASS

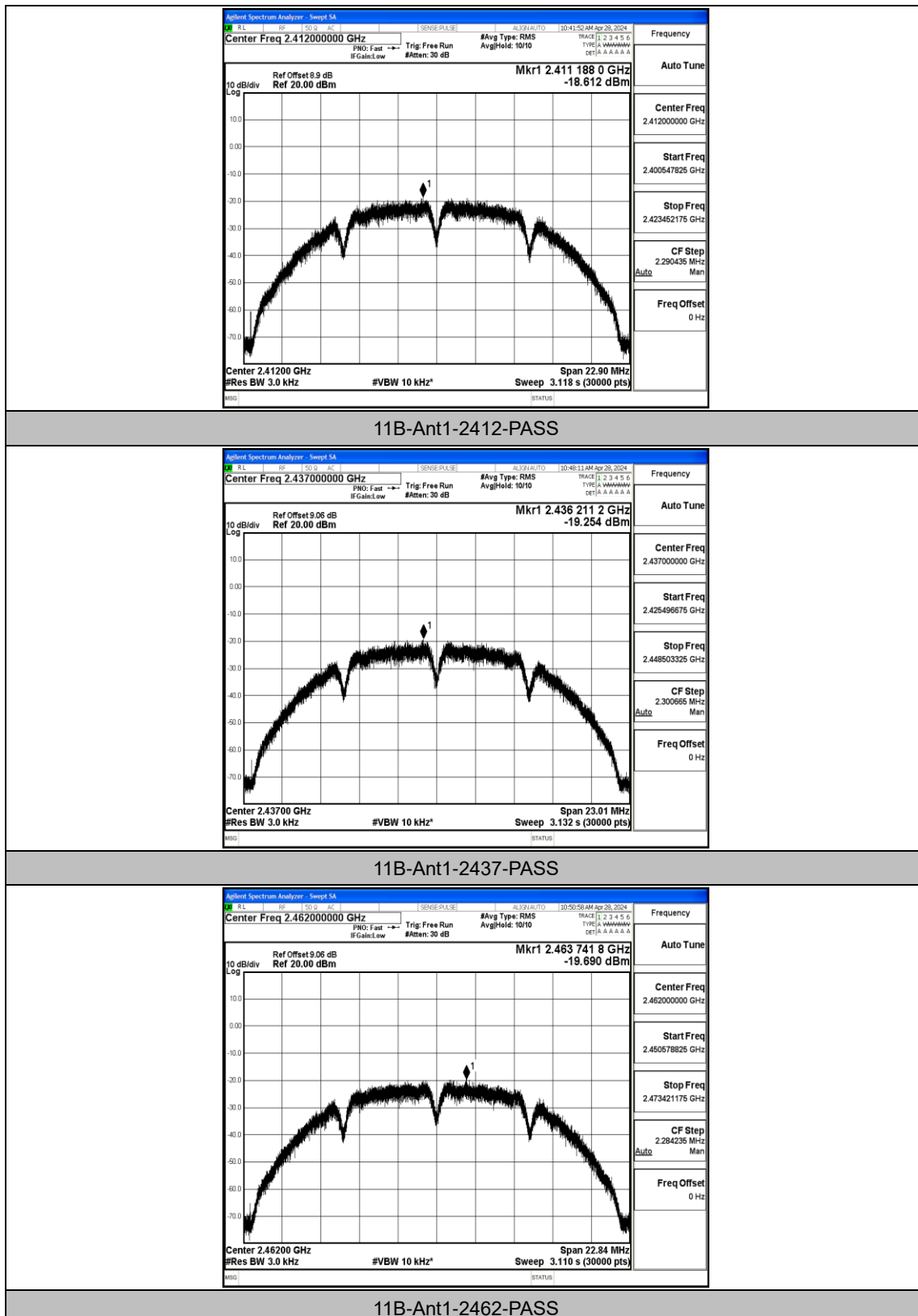
Note: The Duty Cycle Factor is compensated in the result.

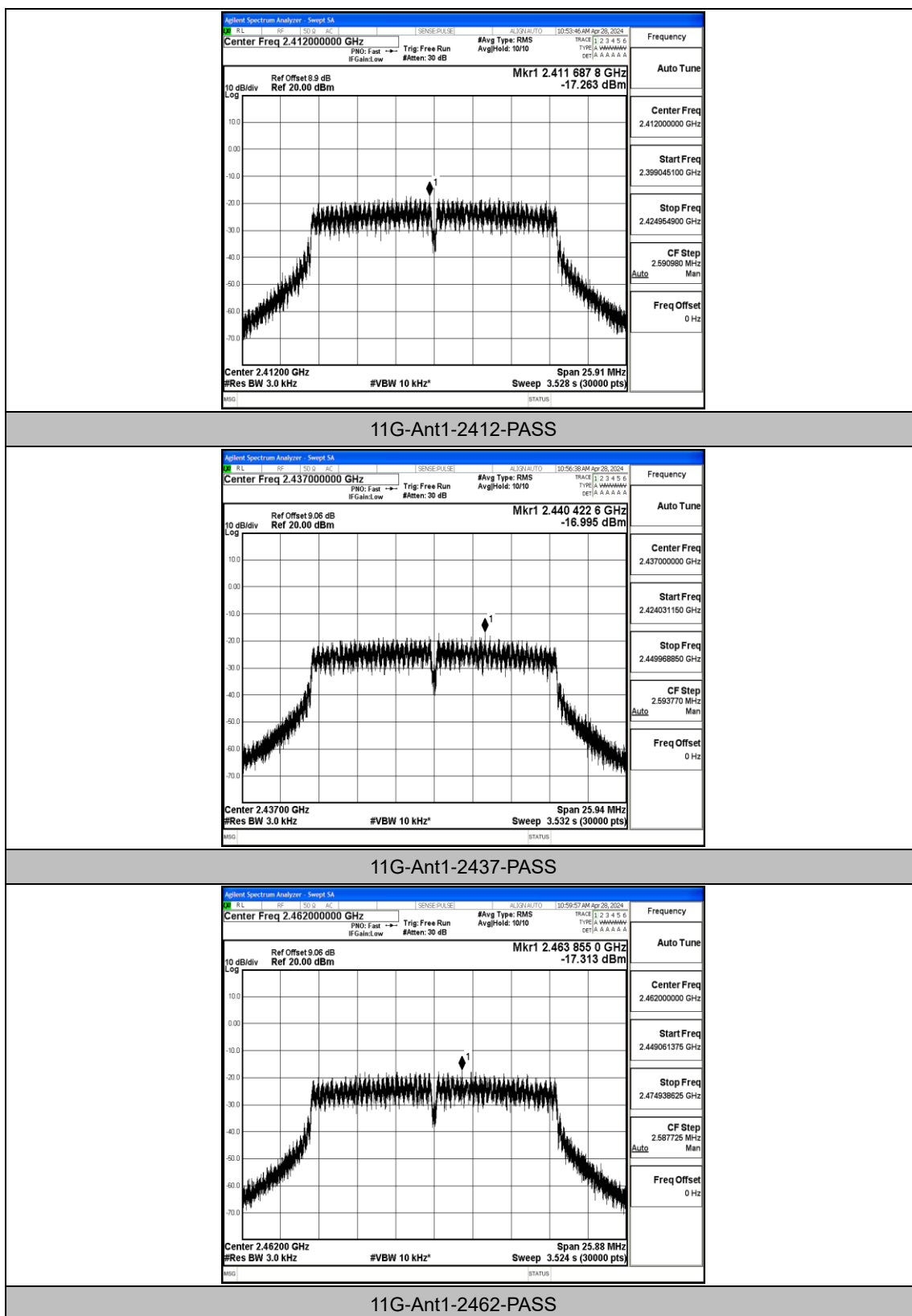
Appendix D: Maximum Average power spectral density

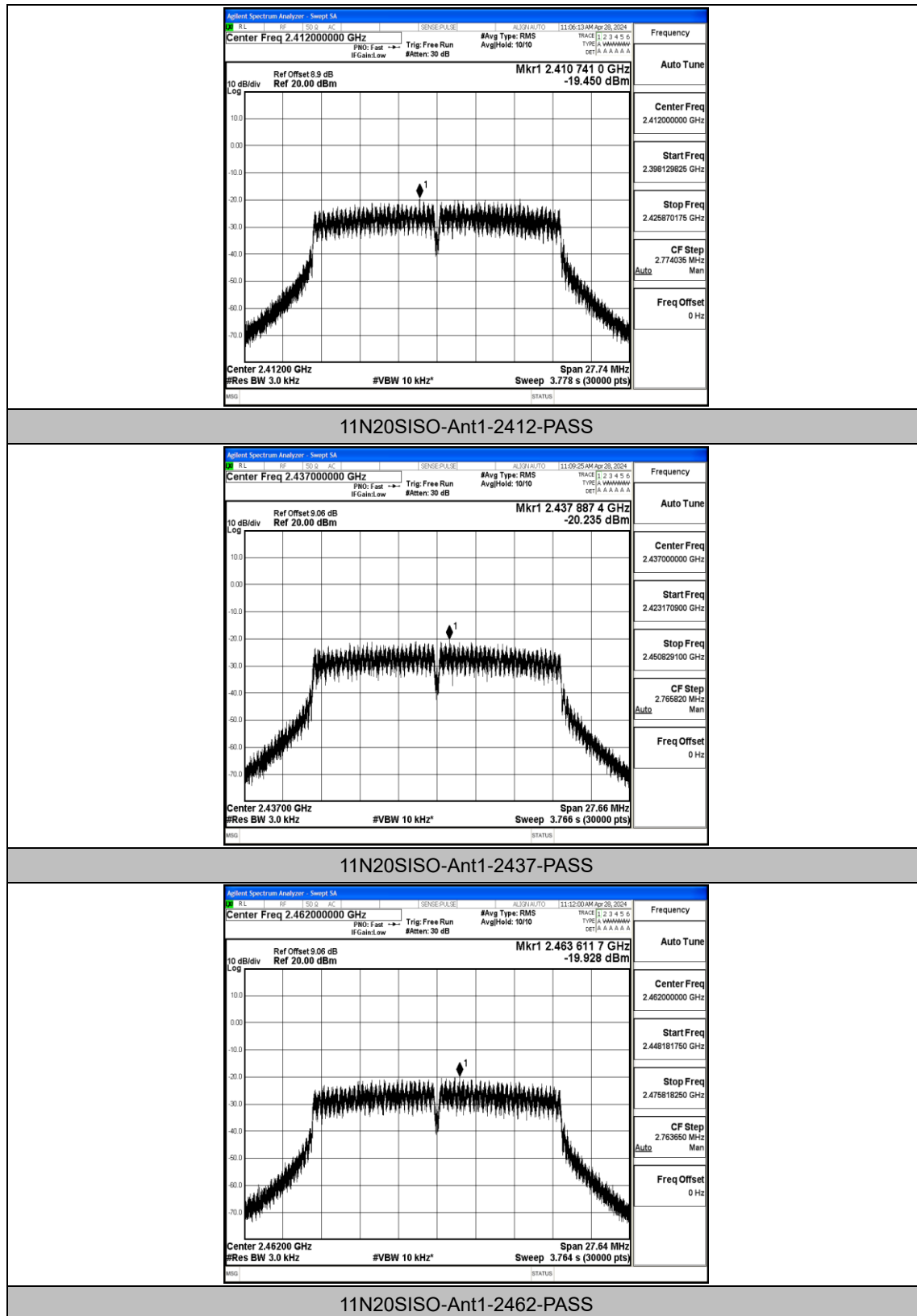
Test Result

TestMode	Antenna	Frequency[MHz]	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-18.48	≤8.00	PASS
11B	Ant1	2437	-19.13	≤8.00	PASS
11B	Ant1	2462	-19.54	≤8.00	PASS
11G	Ant1	2412	-17.08	≤8.00	PASS
11G	Ant1	2437	-16.71	≤8.00	PASS
11G	Ant1	2462	-16.83	≤8.00	PASS
11N20SISO	Ant1	2412	-19.10	≤8.00	PASS
11N20SISO	Ant1	2437	-19.87	≤8.00	PASS
11N20SISO	Ant1	2462	-19.67	≤8.00	PASS

Test Graphs





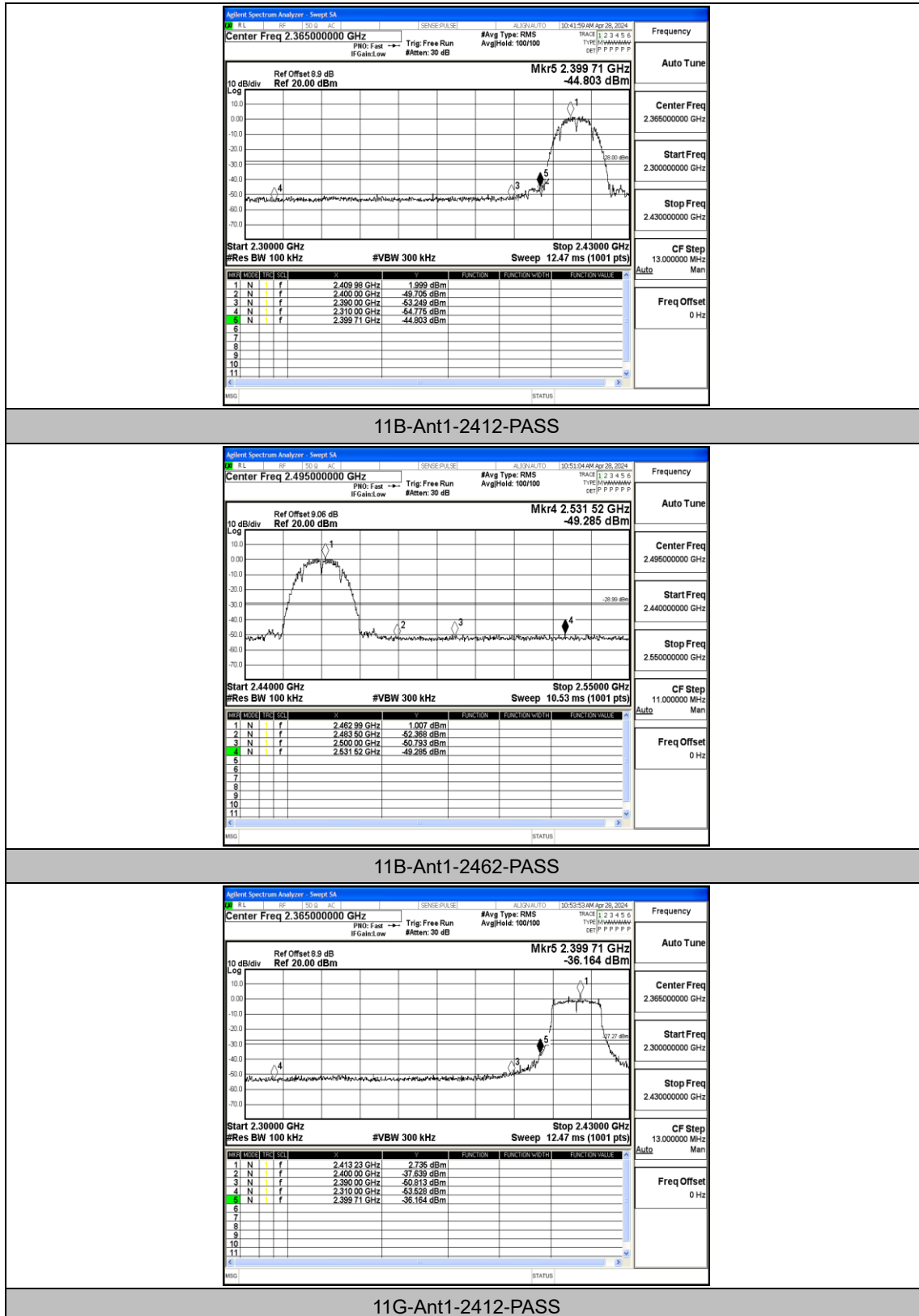


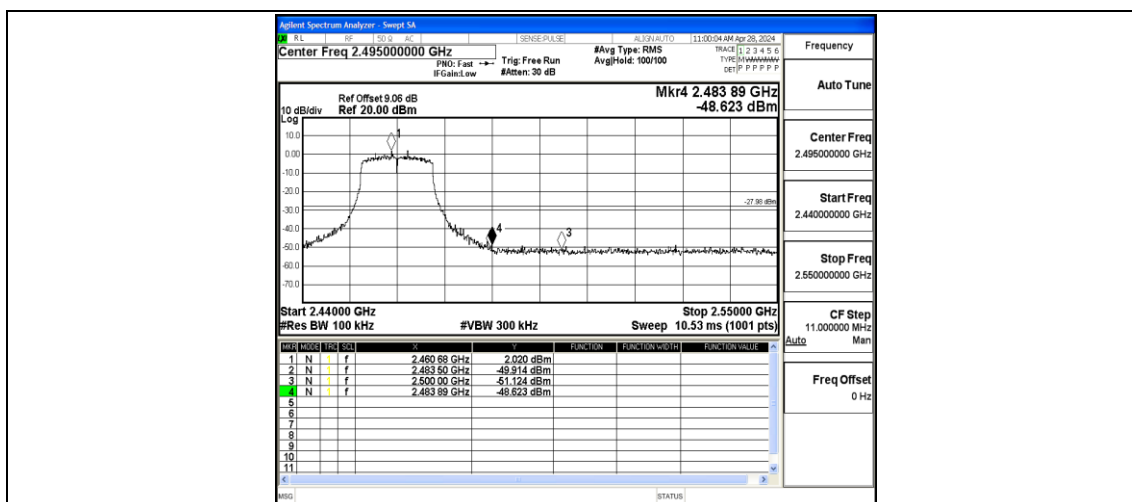
Appendix E: Band edge measurements

Test Result

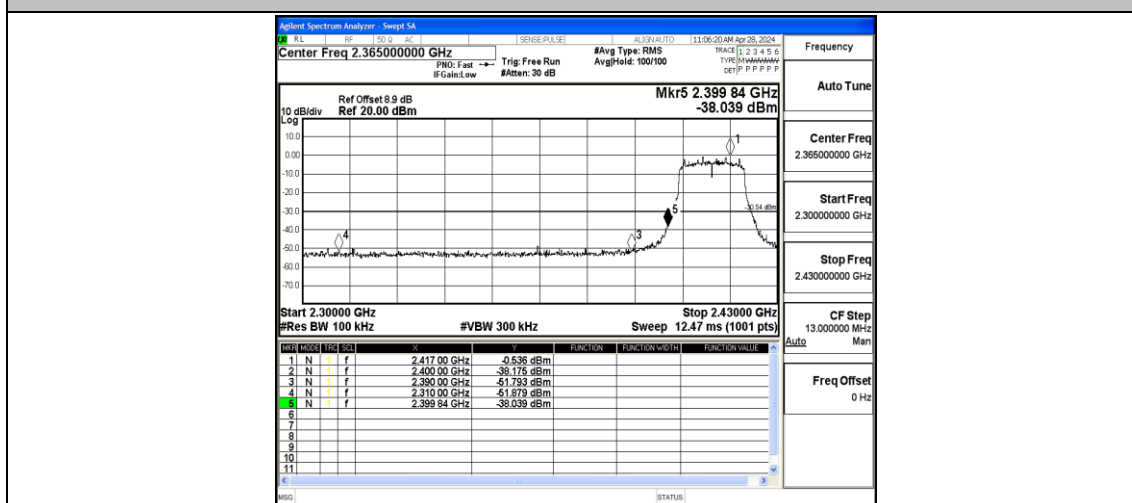
TestMode	Antenna	Channel	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	2.00	-44.8	≤-28	PASS
11B	Ant1	High	2462	1.01	-49.29	≤-28.99	PASS
11G	Ant1	Low	2412	2.74	-36.16	≤-27.27	PASS
11G	Ant1	High	2462	2.02	-48.62	≤-27.98	PASS
11N20SISO	Ant1	Low	2412	-0.54	-38.04	≤-30.54	PASS
11N20SISO	Ant1	High	2462	-0.83	-49.19	≤-30.83	PASS

Test Graphs

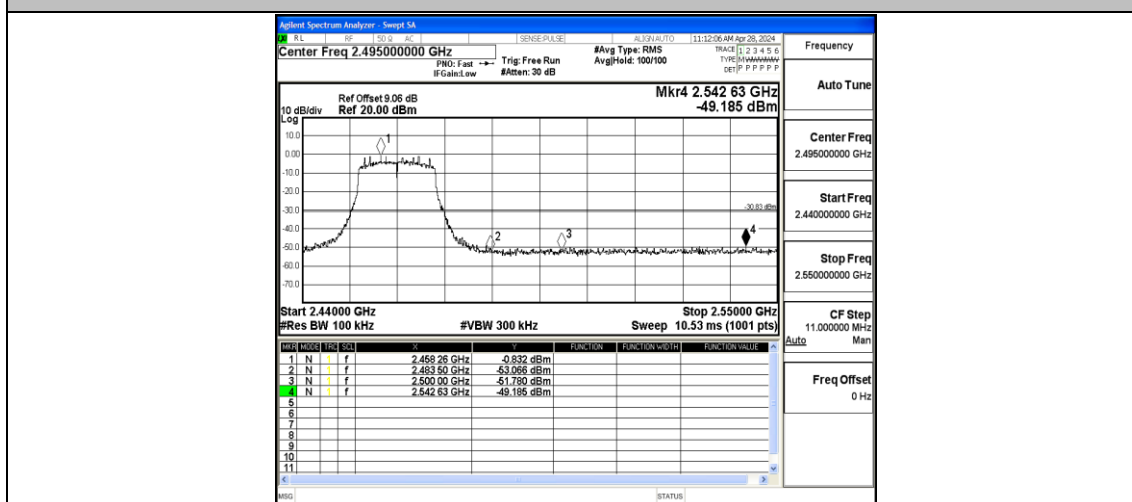




11G-Ant1-2462-PASS



11N20SISO-Ant1-2412-PASS



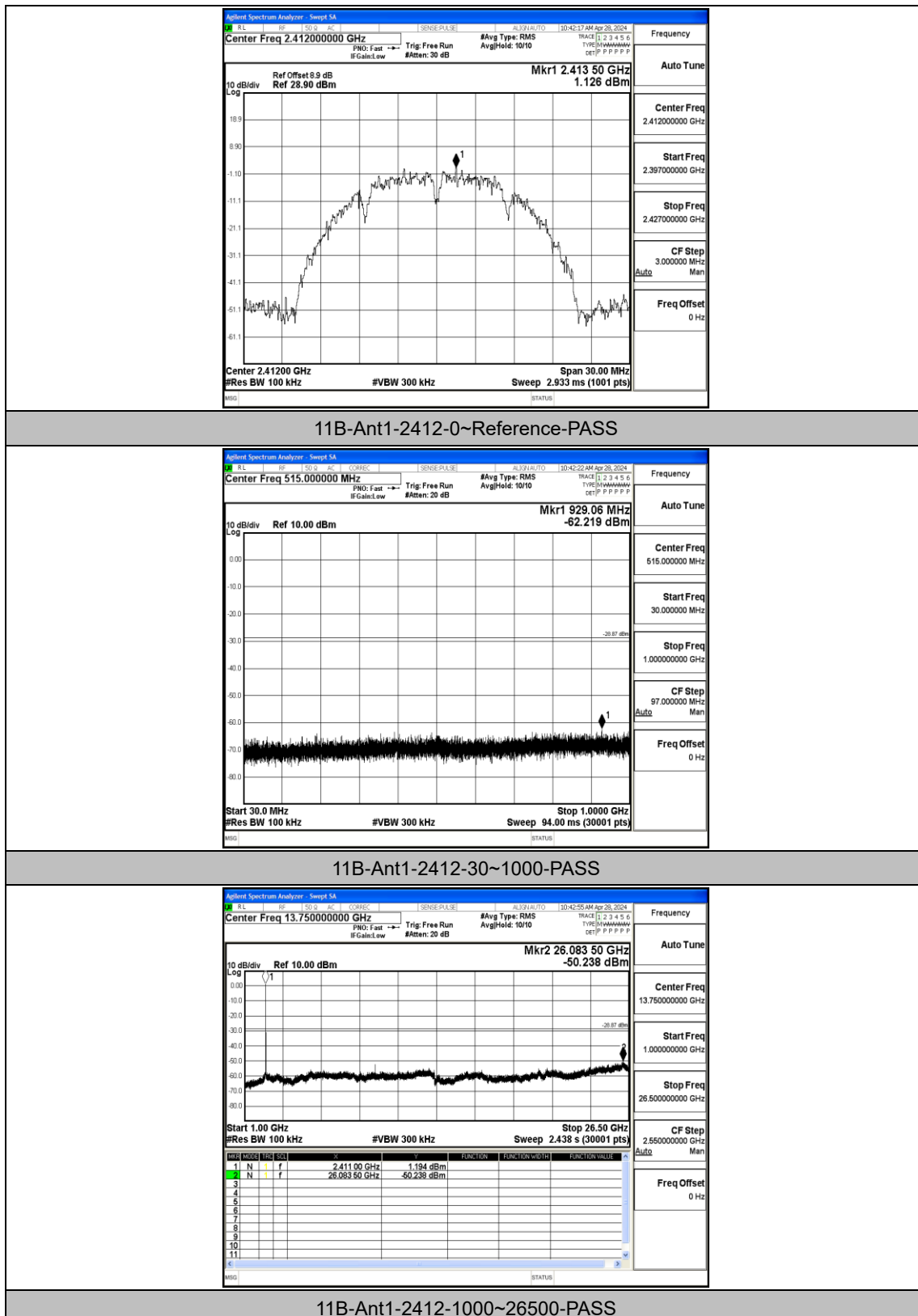
11N20SISO-Ant1-2462-PASS

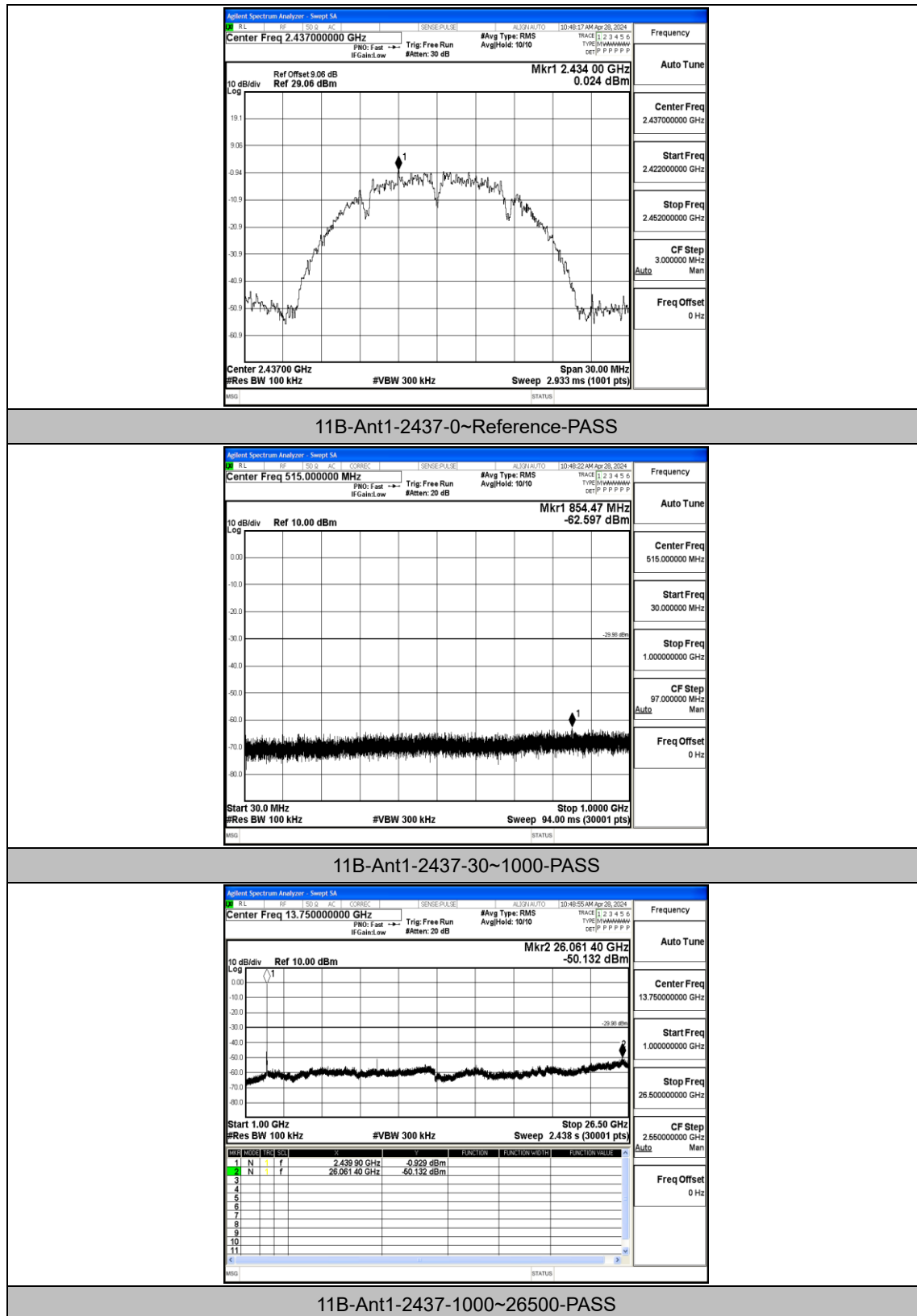
Appendix F: Conducted Spurious Emission

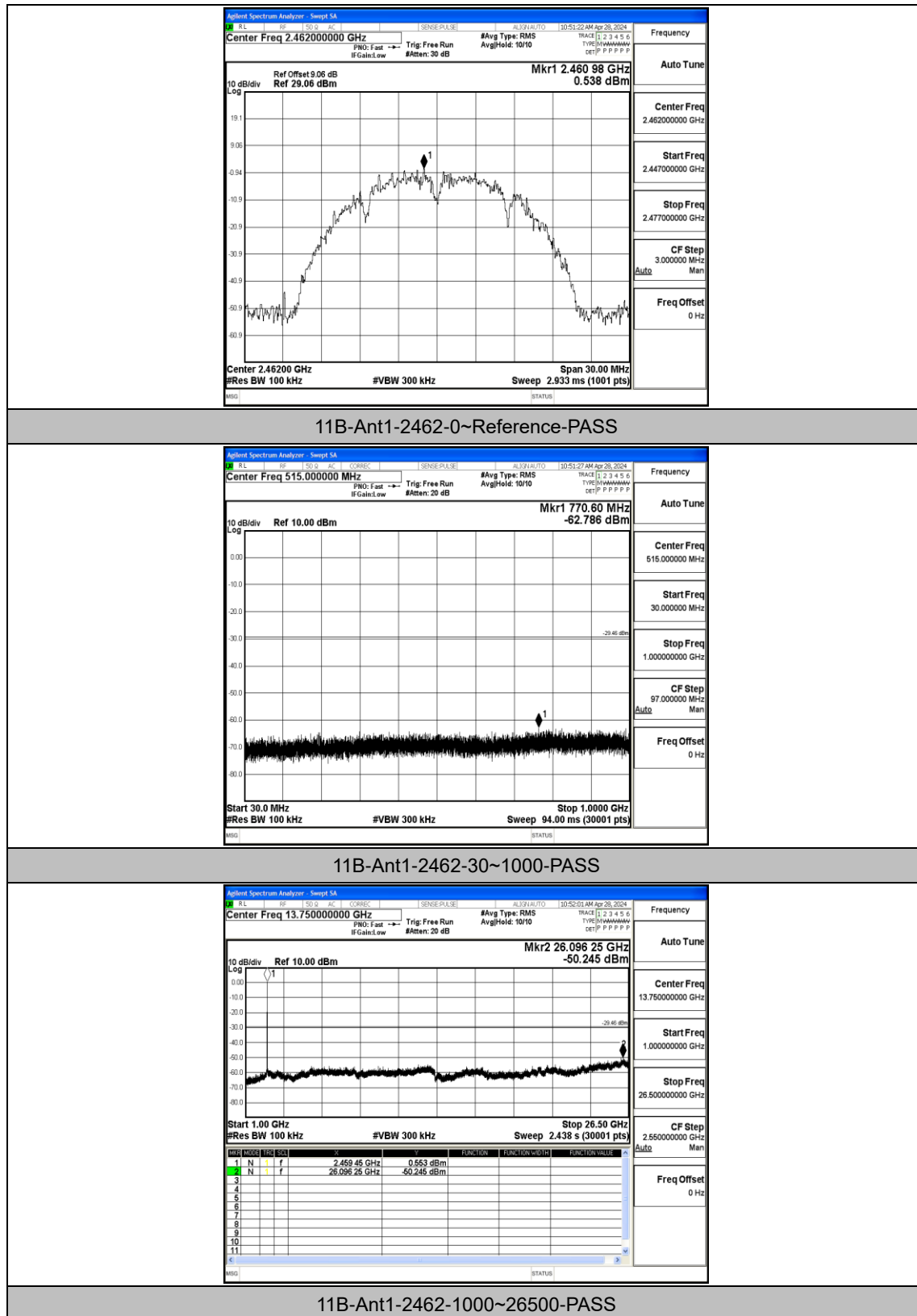
Test Result

TestMode	Antenna	Frequency[MHz]	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	0~Reference	1.13	1.13	---	PASS
11B	Ant1	2412	30~1000	1.13	-62.22	≤-28.87	PASS
11B	Ant1	2412	1000~26500	1.13	-50.24	≤-28.87	PASS
11B	Ant1	2437	0~Reference	0.02	0.02	---	PASS
11B	Ant1	2437	30~1000	0.02	-62.6	≤-29.98	PASS
11B	Ant1	2437	1000~26500	0.02	-50.13	≤-29.98	PASS
11B	Ant1	2462	0~Reference	0.54	0.54	---	PASS
11B	Ant1	2462	30~1000	0.54	-62.79	≤-29.46	PASS
11B	Ant1	2462	1000~26500	0.54	-50.25	≤-29.46	PASS
11G	Ant1	2412	0~Reference	1.89	1.89	---	PASS
11G	Ant1	2412	30~1000	1.89	-62.64	≤-28.11	PASS
11G	Ant1	2412	1000~26500	1.89	-50.7	≤-28.11	PASS
11G	Ant1	2437	0~Reference	-2.24	-2.24	---	PASS
11G	Ant1	2437	30~1000	-2.24	-63.08	≤-32.24	PASS
11G	Ant1	2437	1000~26500	-2.24	-50.13	≤-32.24	PASS
11G	Ant1	2462	0~Reference	-1.45	-1.45	---	PASS
11G	Ant1	2462	30~1000	-1.45	-63.06	≤-31.45	PASS
11G	Ant1	2462	1000~26500	-1.45	-50.42	≤-31.45	PASS
11N20SISO	Ant1	2412	0~Reference	-2.88	-2.88	---	PASS
11N20SISO	Ant1	2412	30~1000	-2.88	-62.3	≤-32.88	PASS
11N20SISO	Ant1	2412	1000~26500	-2.88	-49.34	≤-32.88	PASS
11N20SISO	Ant1	2437	0~Reference	-3.91	-3.91	---	PASS
11N20SISO	Ant1	2437	30~1000	-3.91	-62.38	≤-33.91	PASS
11N20SISO	Ant1	2437	1000~26500	-3.91	-50.24	≤-33.91	PASS
11N20SISO	Ant1	2462	0~Reference	-0.61	-0.61	---	PASS
11N20SISO	Ant1	2462	30~1000	-0.61	-61.8	≤-30.61	PASS
11N20SISO	Ant1	2462	1000~26500	-0.61	-49.28	≤-30.61	PASS

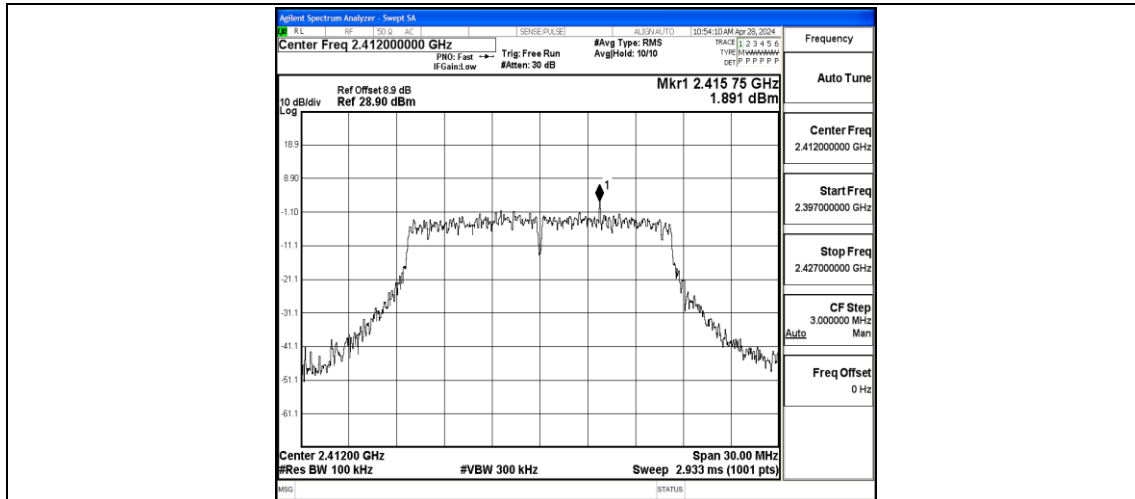
Test Graphs



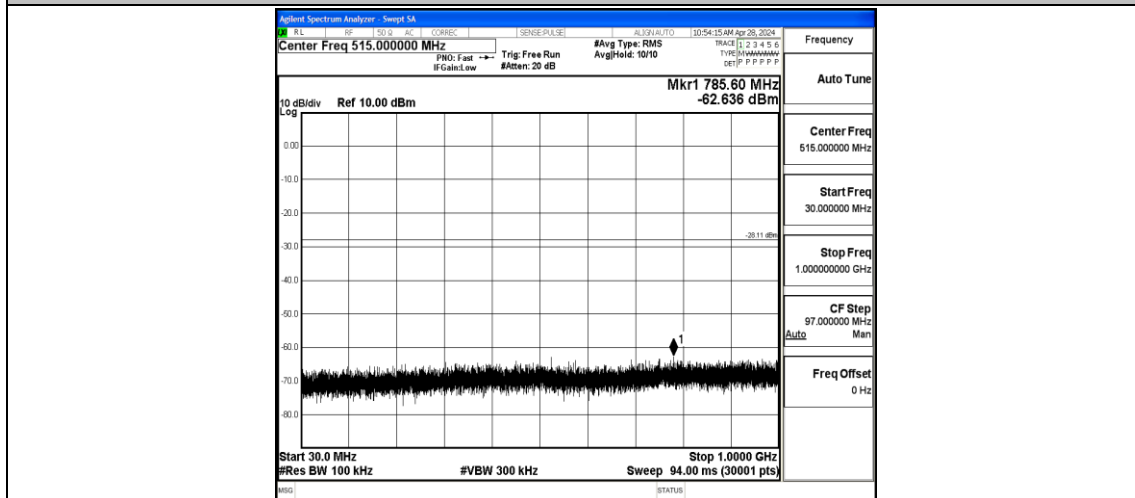




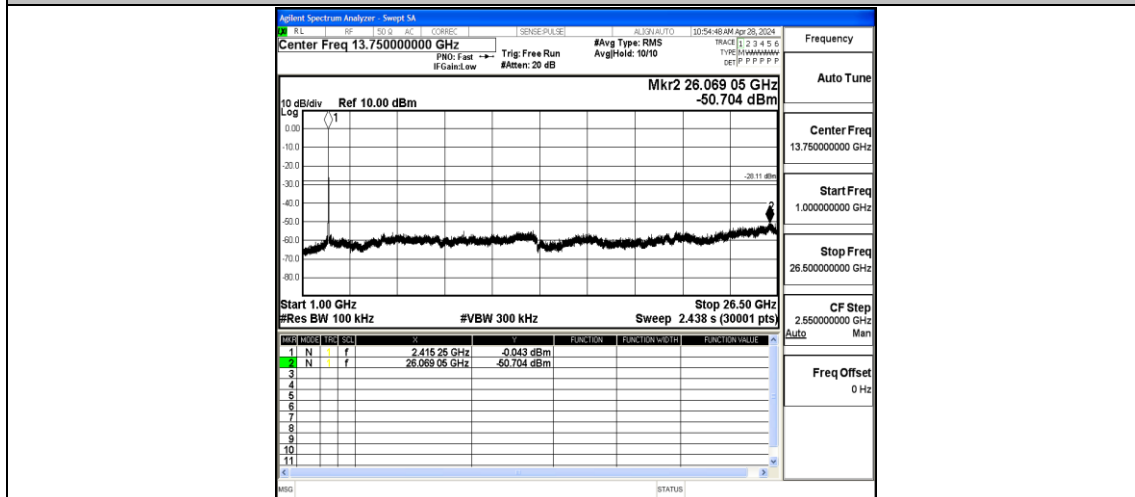
11B-Ant1-2462-1000~26500-PASS



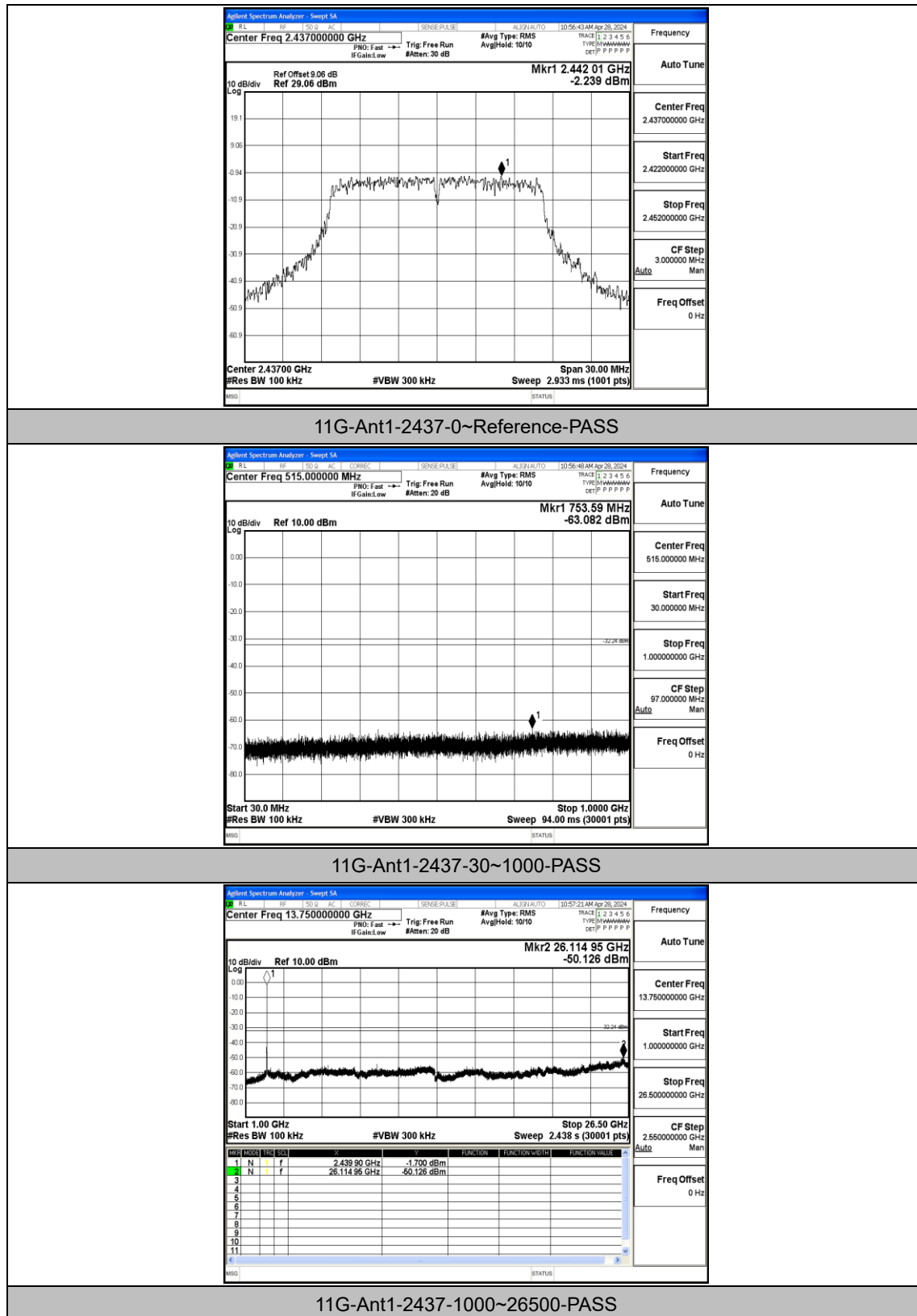
11G-Ant1-2412-0~Reference-PASS

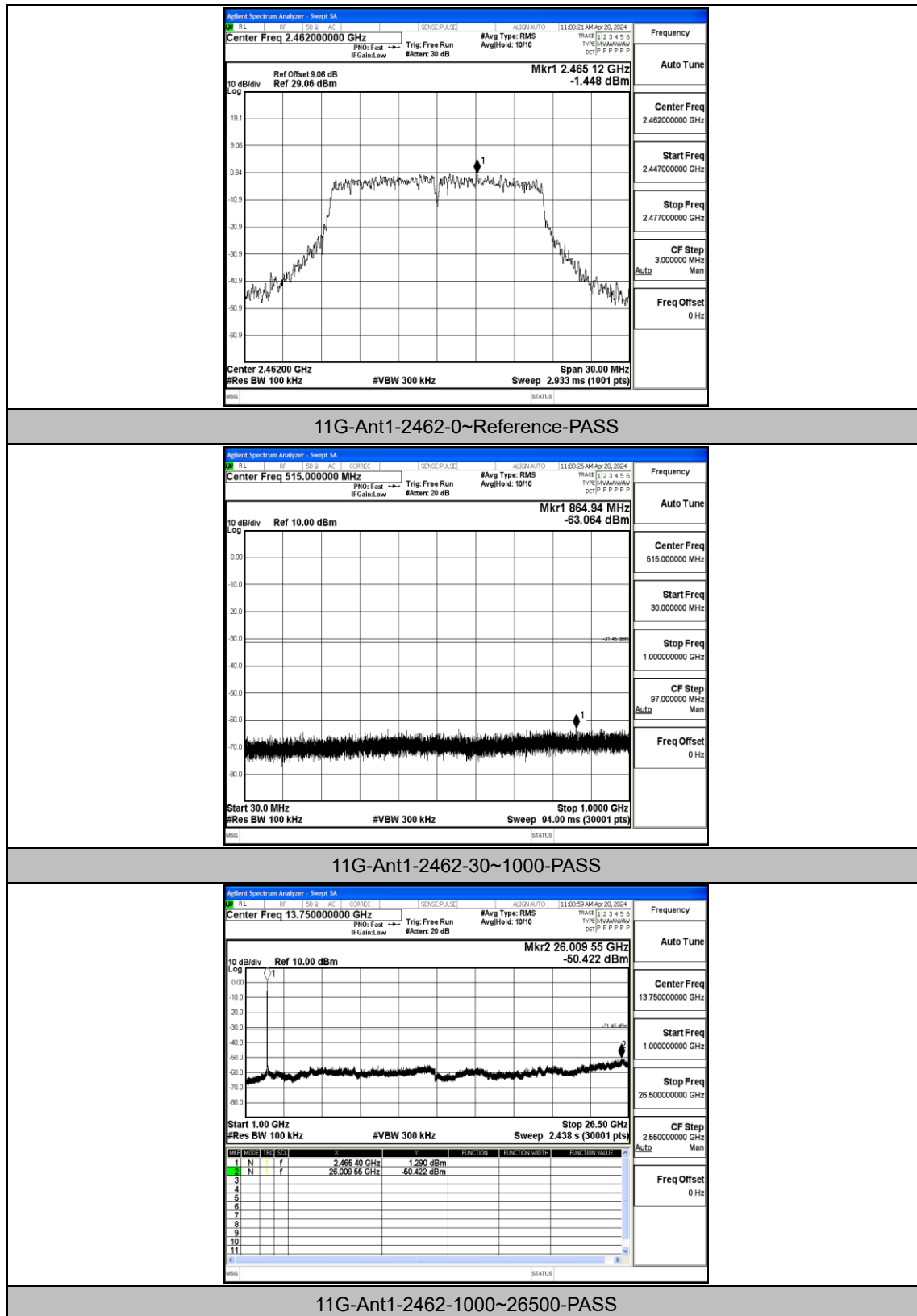


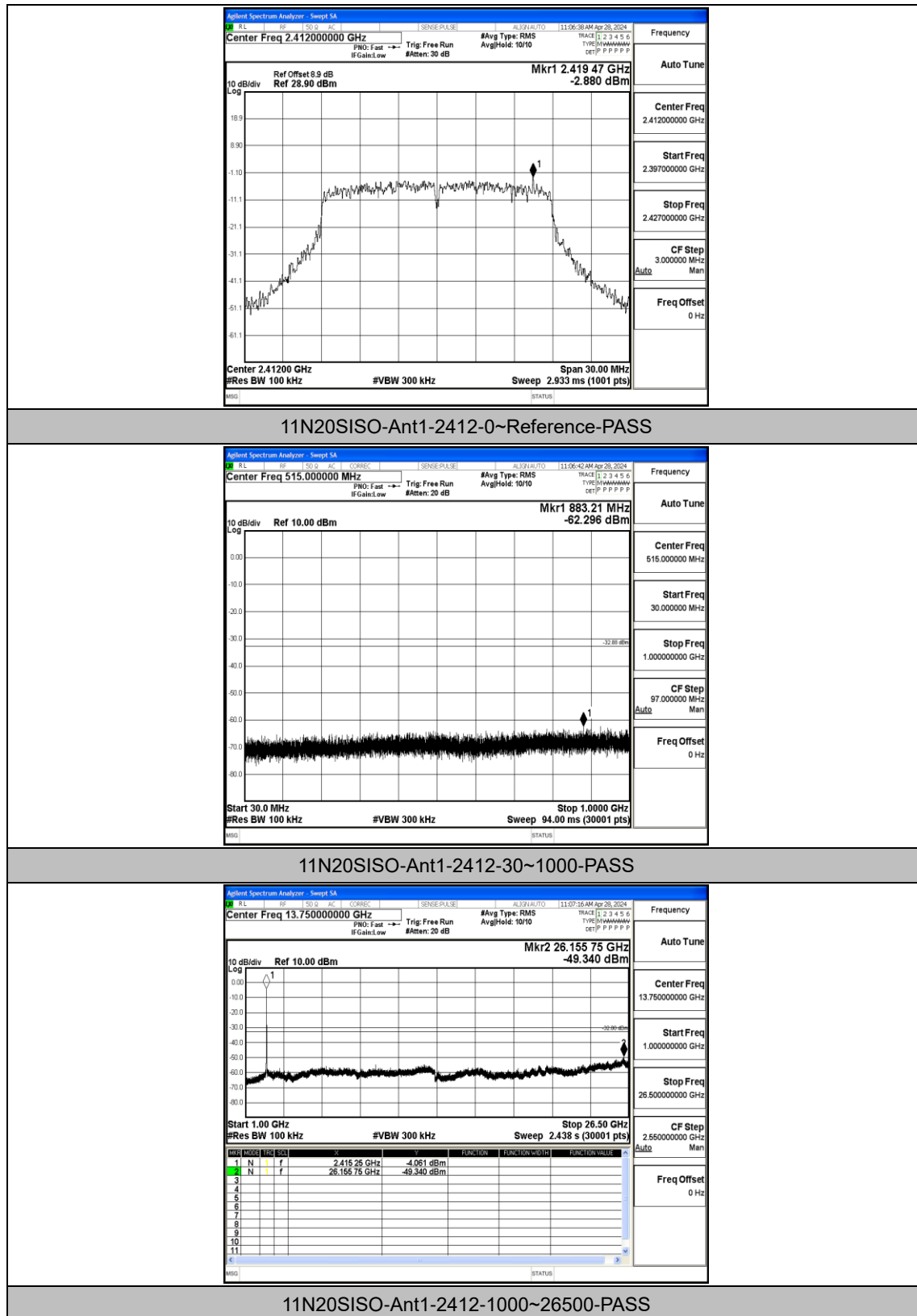
11G-Ant1-2412-30~1000-PASS

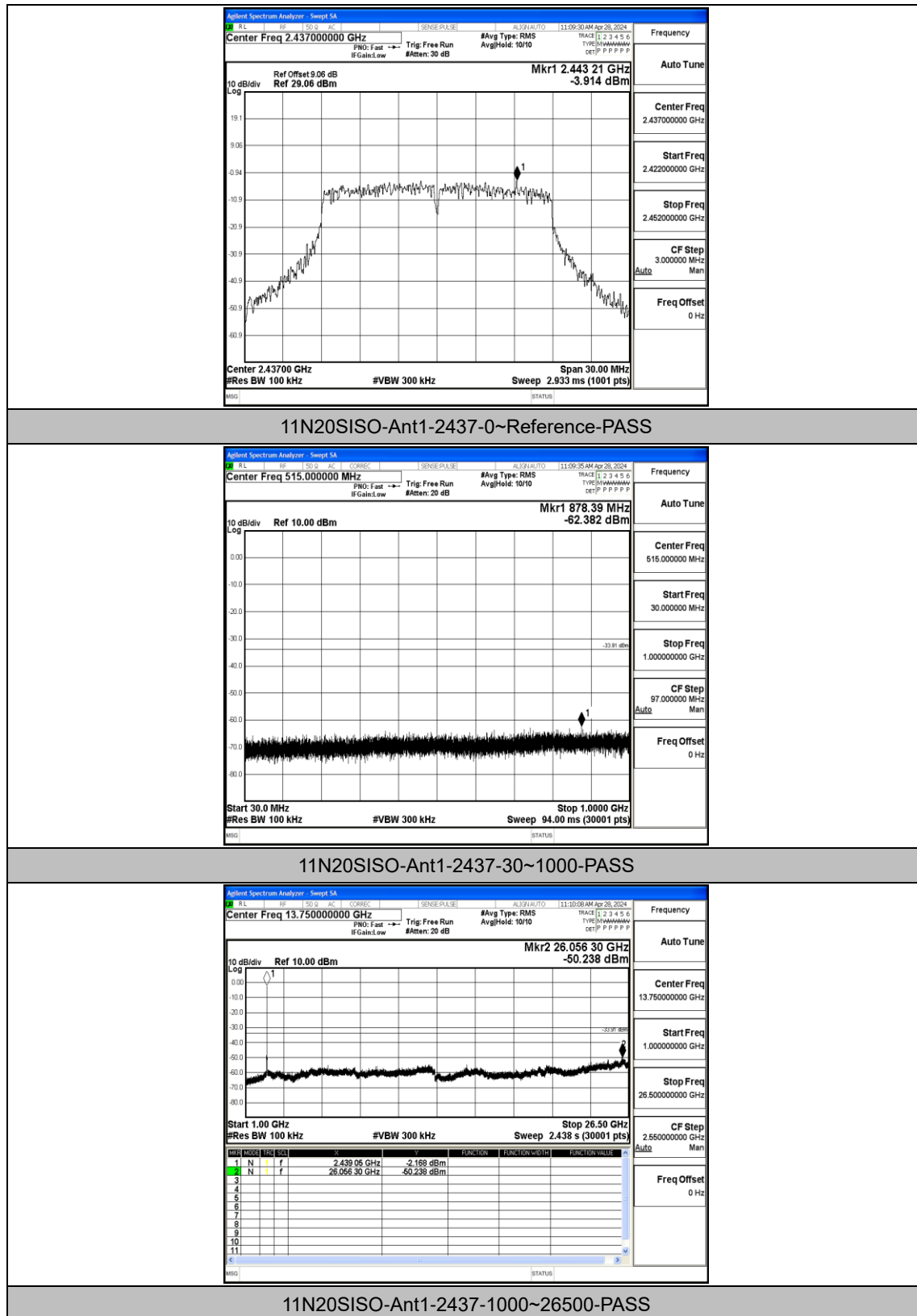


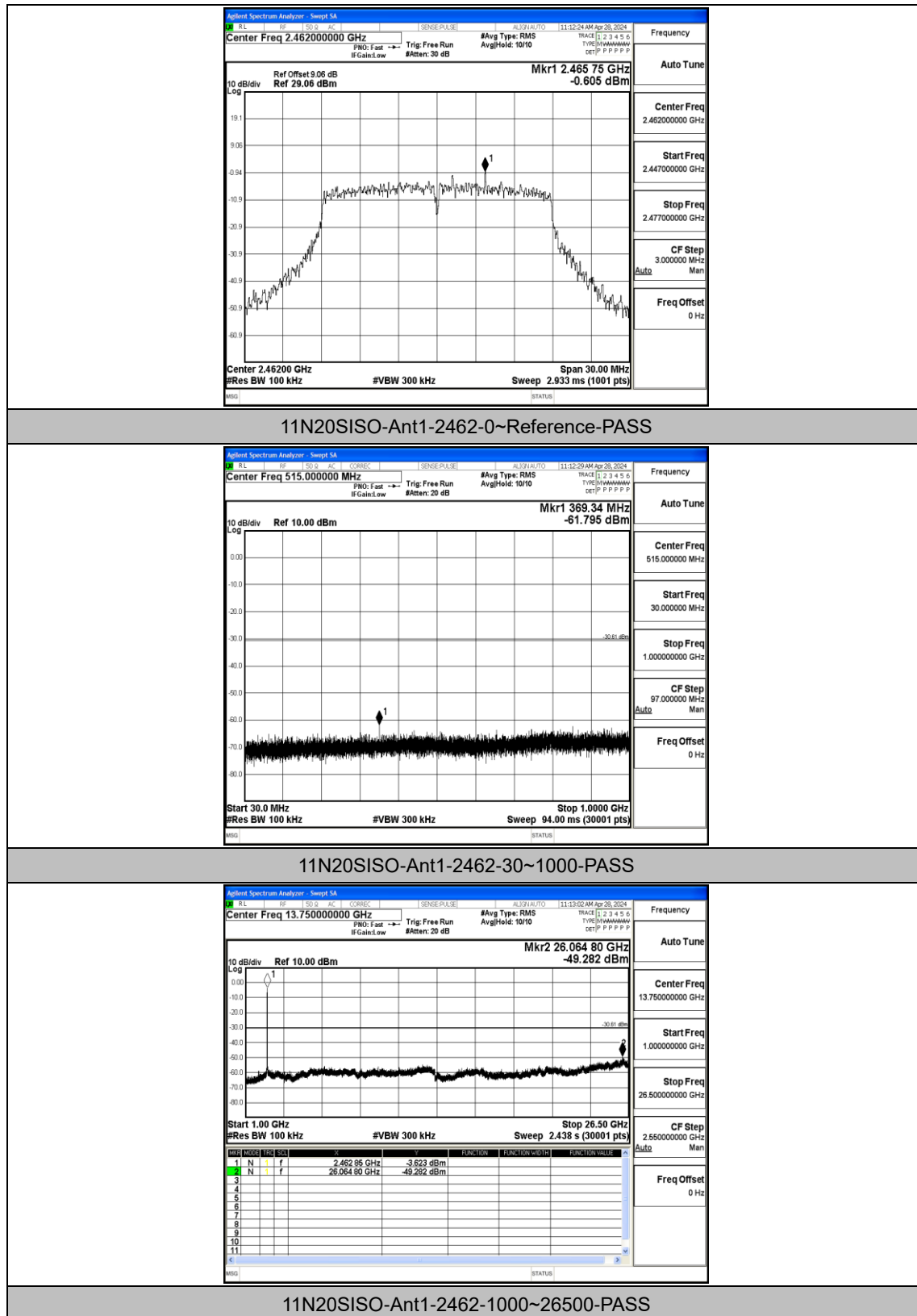
11G-Ant1-2412-1000~26500-PASS









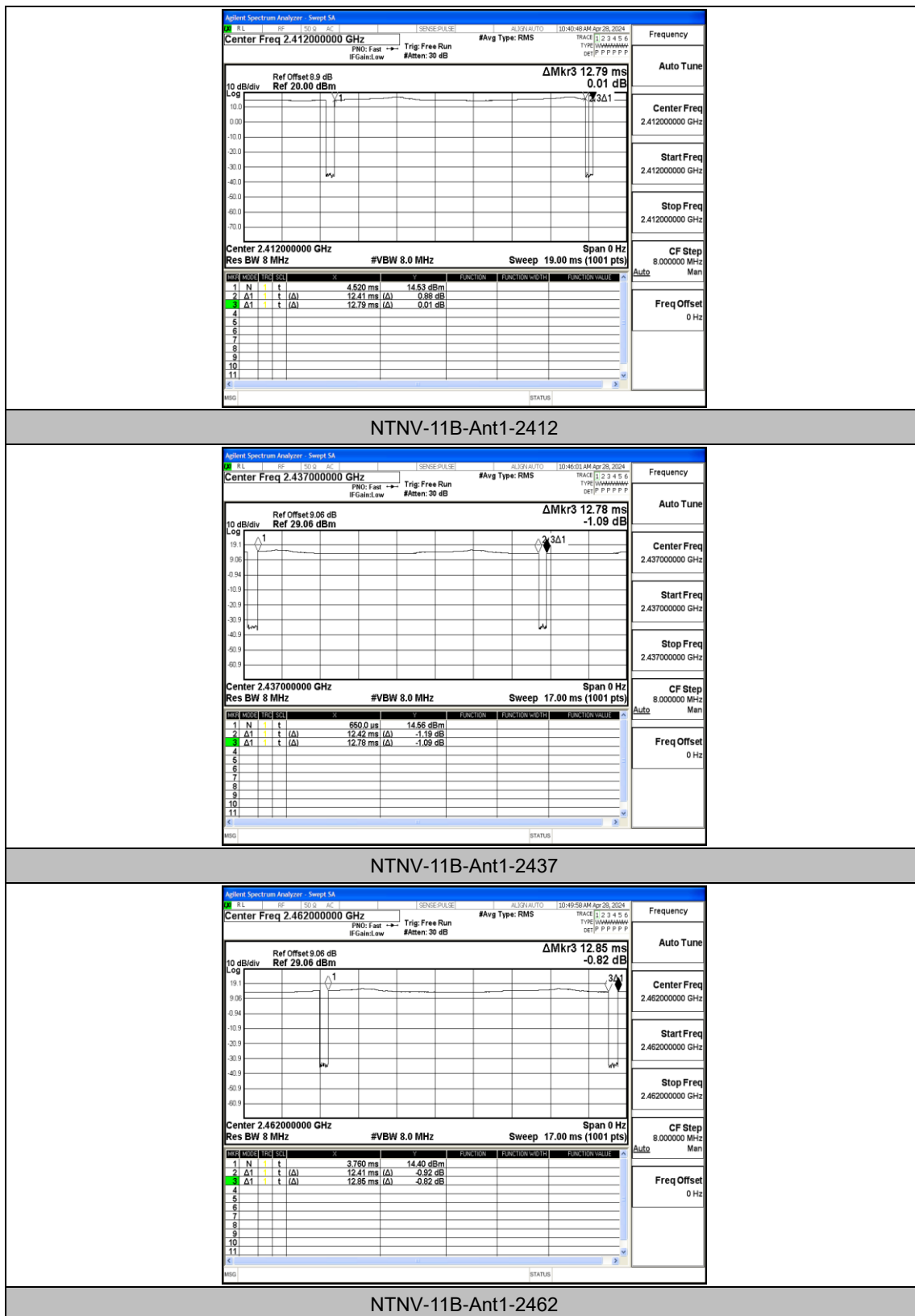


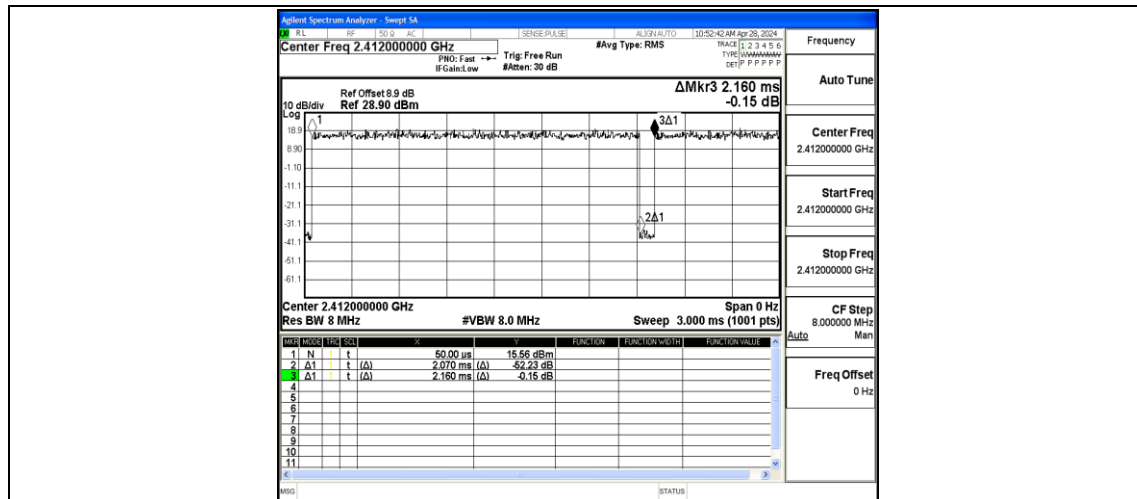
Appendix G: Duty Cycle

Test Result

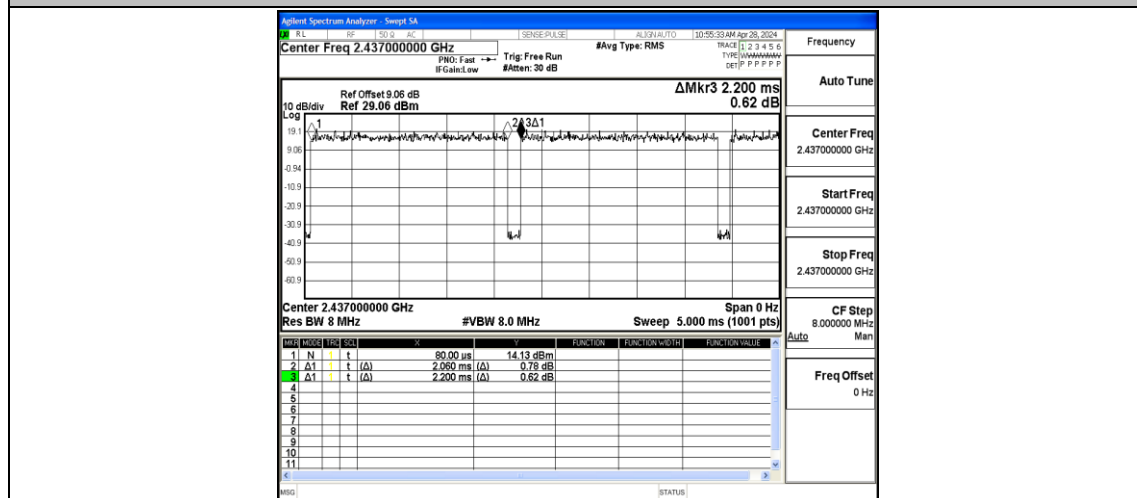
TestMode	Antenna	Frequency[MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Factor
11B	Ant1	2412	12.41	12.79	97.03	0.13
11B	Ant1	2437	12.42	12.78	97.18	0.12
11B	Ant1	2462	12.41	12.85	96.58	0.15
11G	Ant1	2412	2.07	2.16	95.83	0.18
11G	Ant1	2437	2.06	2.20	93.64	0.29
11G	Ant1	2462	2.06	2.30	89.57	0.48
11N20SISO	Ant1	2412	1.93	2.09	92.34	0.35
11N20SISO	Ant1	2437	1.92	2.09	91.87	0.37
11N20SISO	Ant1	2462	1.93	2.05	94.15	0.26

Test Graphs

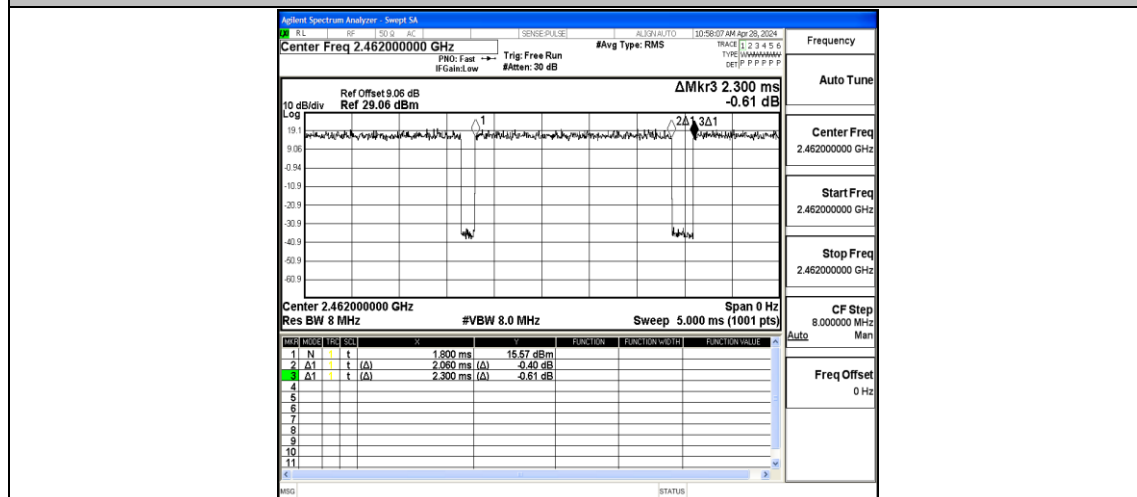




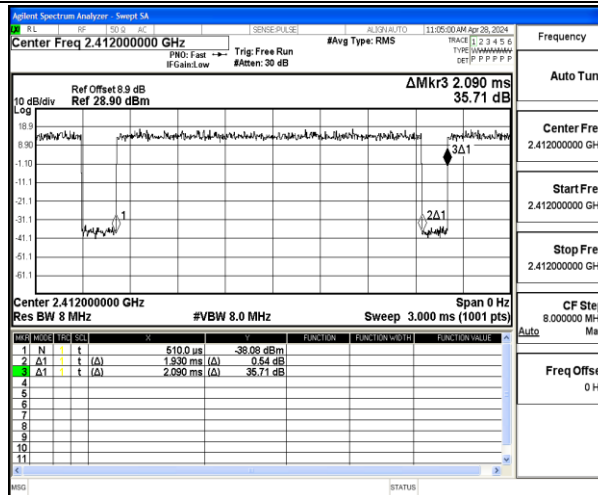
NTNV-11G-Ant1-2412



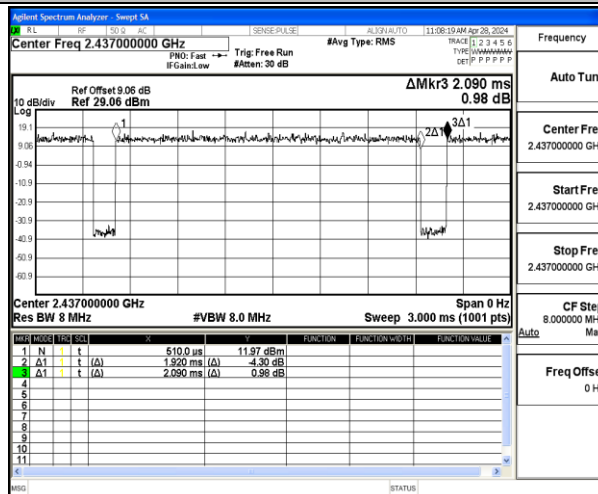
NTNV-11G-Ant1-2437



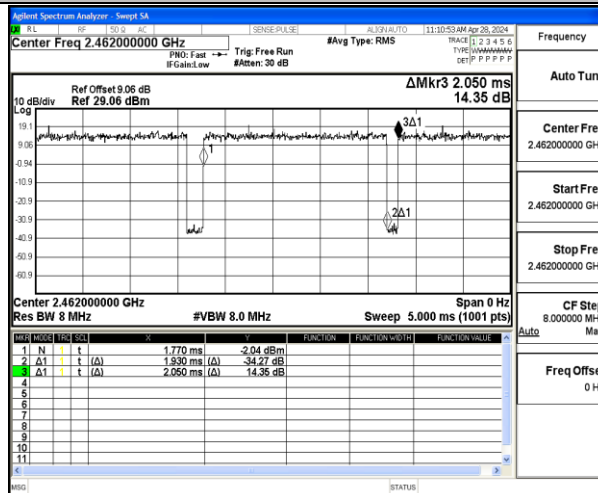
NTNV-11G-Ant1-2462



NTNV-11N20SISO-Ant1-2412



NTNV-11N20SISO-Ant1-2437



NTNV-11N20SISO-Ant1-2462

Appendix H: Emissions in Restricted Bands

Test Result

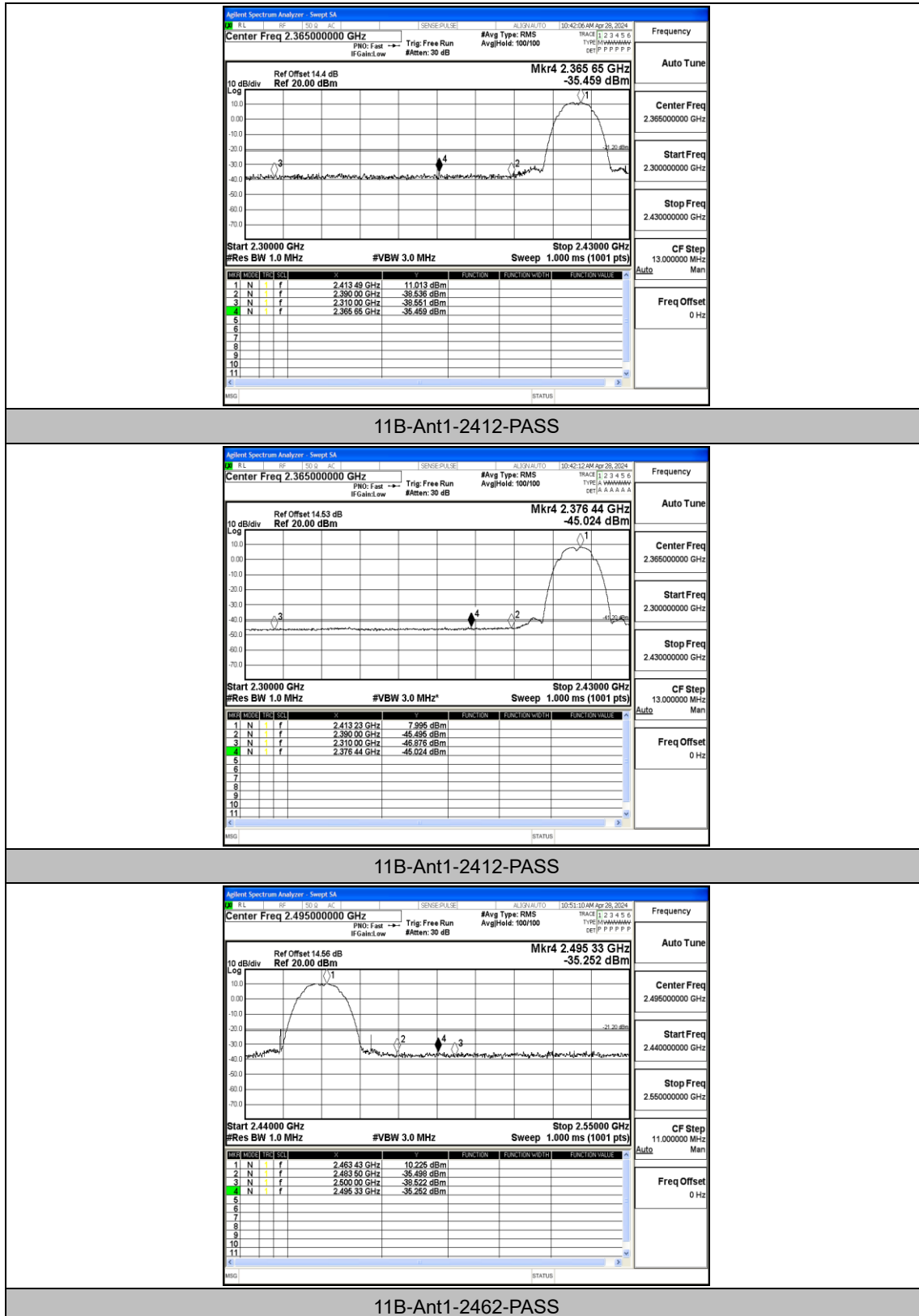
TestMode	Antenna	ChName	Frequency[MHz]	Detector	Freq [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
11B	Ant1	Low	2412	Peak	2390.000	-38.54	≤-21.20	56.66	≤74	PASS
11B	Ant1	Low	2412	Peak	2310.000	-38.55	≤-21.20	56.65	≤74	PASS
11B	Ant1	Low	2412	Peak	2365.650	-35.46	≤-21.20	59.74	≤74	PASS
11B	Ant1	Low	2412	AV	2390.000	-45.5	≤-41.20	49.70	≤54	PASS
11B	Ant1	Low	2412	AV	2310.000	-46.88	≤-41.20	48.32	≤54	PASS
11B	Ant1	Low	2412	AV	2376.440	-45.02	≤-41.20	50.18	≤54	PASS
11B	Ant1	High	2462	Peak	2483.500	-35.5	≤-21.20	59.70	≤74	PASS
11B	Ant1	High	2462	Peak	2500.000	-38.52	≤-21.20	56.68	≤74	PASS
11B	Ant1	High	2462	Peak	2495.330	-35.25	≤-21.20	59.95	≤74	PASS
11B	Ant1	High	2462	AV	2483.500	-45.81	≤-41.20	49.39	≤54	PASS
11B	Ant1	High	2462	AV	2500.000	-45.31	≤-41.20	49.89	≤54	PASS
11B	Ant1	High	2462	AV	2490.490	-44.83	≤-41.20	50.37	≤54	PASS
11G	Ant1	Low	2412	Peak	2390.000	-35.35	≤-21.20	59.85	≤74	PASS
11G	Ant1	Low	2412	Peak	2310.000	-40.36	≤-21.20	54.84	≤74	PASS
11G	Ant1	Low	2412	Peak	2381.510	-32.38	≤-21.20	62.82	≤74	PASS
11G	Ant1	Low	2412	AV	2390.000	-43.35	≤-41.20	51.85	≤54	PASS
11G	Ant1	Low	2412	AV	2310.000	-46.96	≤-41.20	48.24	≤54	PASS
11G	Ant1	Low	2412	AV	2389.050	-43.03	≤-41.20	52.17	≤54	PASS
11G	Ant1	High	2462	Peak	2483.500	-35.18	≤-21.20	60.02	≤74	PASS
11G	Ant1	High	2462	Peak	2500.000	-37.02	≤-21.20	58.18	≤74	PASS
11G	Ant1	High	2462	Peak	2494.340	-32.57	≤-21.20	62.63	≤74	PASS
11G	Ant1	High	2462	AV	2483.500	-43.87	≤-41.20	51.33	≤54	PASS
11G	Ant1	High	2462	AV	2500.000	-45.3	≤-41.20	49.90	≤54	PASS
11G	Ant1	High	2462	AV	2484.000	-43.17	≤-41.20	52.03	≤54	PASS
11N20SIS O	Ant1	Low	2412	Peak	2390.000	-35.78	≤-21.20	59.42	≤74	PASS
11N20SIS O	Ant1	Low	2412	Peak	2310.000	-39.24	≤-21.20	55.96	≤74	PASS
11N20SIS O	Ant1	Low	2412	Peak	2389.570	-33.72	≤-21.20	61.48	≤74	PASS
11N20SIS O	Ant1	Low	2412	AV	2390.000	-44.22	≤-41.20	50.98	≤54	PASS
11N20SIS O	Ant1	Low	2412	AV	2310.000	-46.41	≤-41.20	48.79	≤54	PASS
11N20SIS O	Ant1	Low	2412	AV	2389.960	-44.22	≤-41.20	50.98	≤54	PASS
11N20SIS O	Ant1	High	2462	Peak	2483.500	-37.71	≤-21.20	57.49	≤74	PASS
11N20SIS O	Ant1	High	2462	Peak	2500.000	-38.25	≤-21.20	56.95	≤74	PASS
11N20SIS	Ant1	High	2462	Peak	2485.210	-32.57	≤-21.20	62.63	≤74	PASS

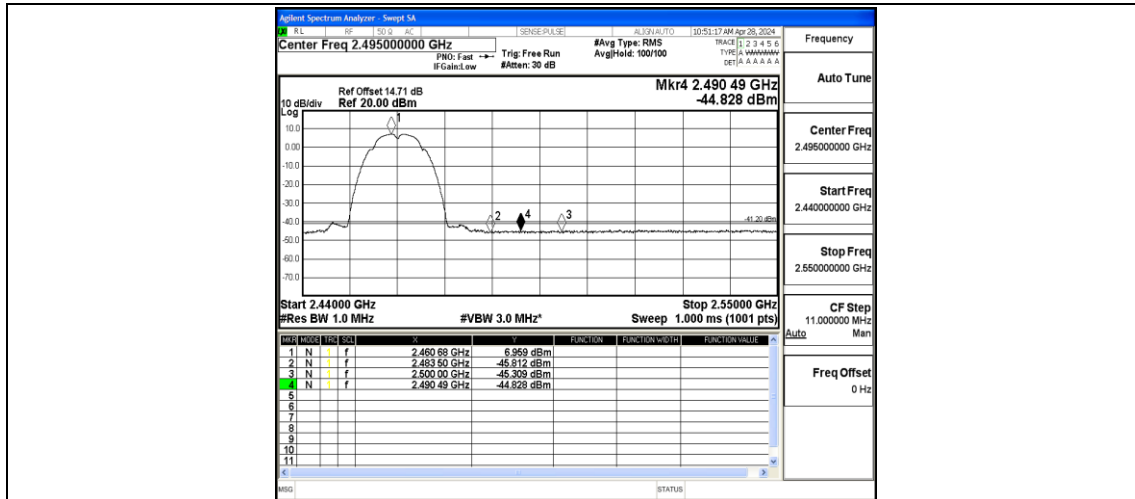
O										
11N20SIS O	Ant1	High	2462	AV	2483.500	-45.08	≤-41.20	50.12	≤54	PASS
11N20SIS O	Ant1	High	2462	AV	2500.000	-44.97	≤-41.20	50.23	≤54	PASS
11N20SIS O	Ant1	High	2462	AV	2495.110	-44.38	≤-41.20	50.82	≤54	PASS

Note:

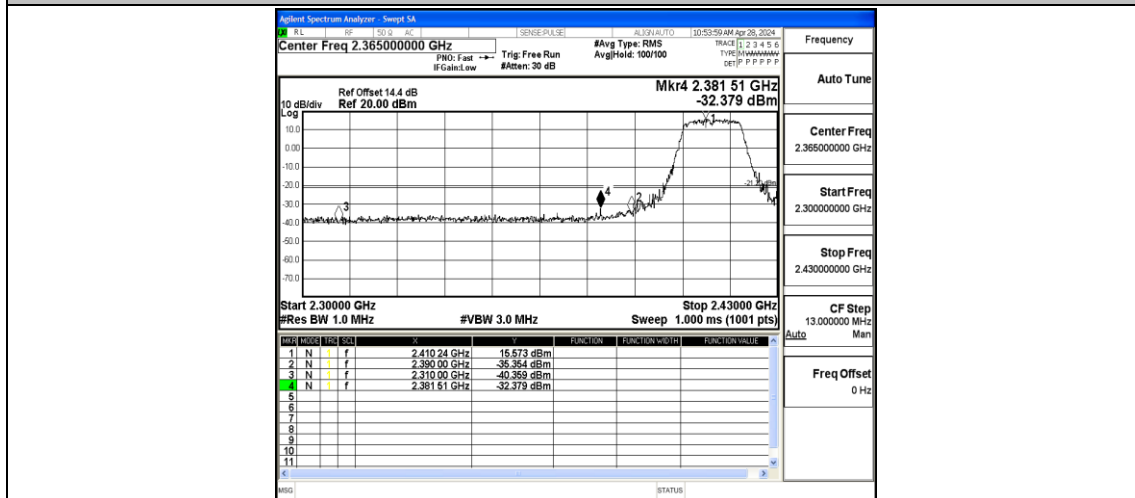
1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

Test Graphs

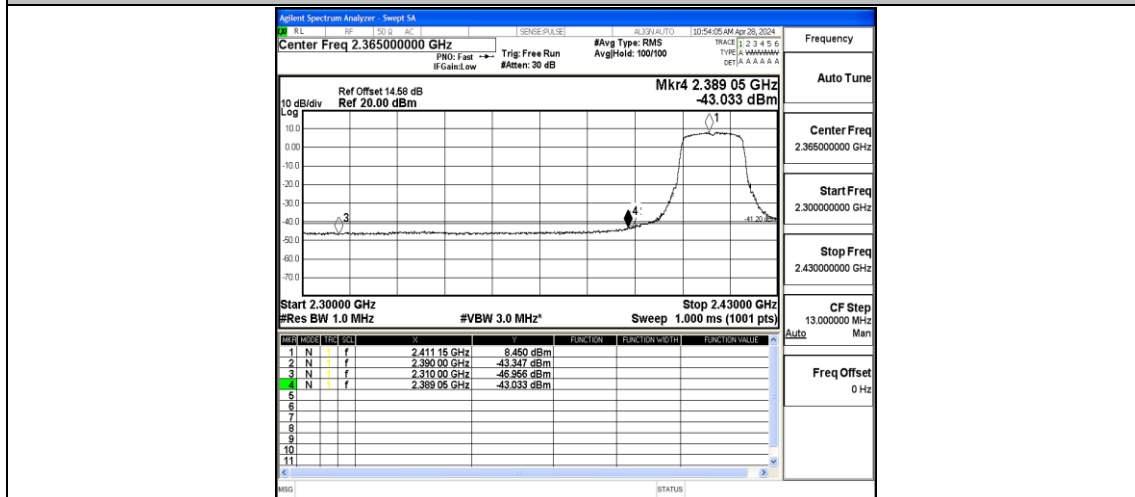




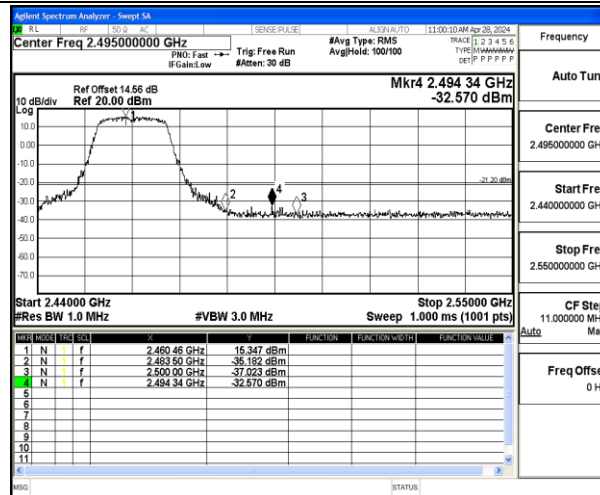
11B-Ant1-2462-PASS



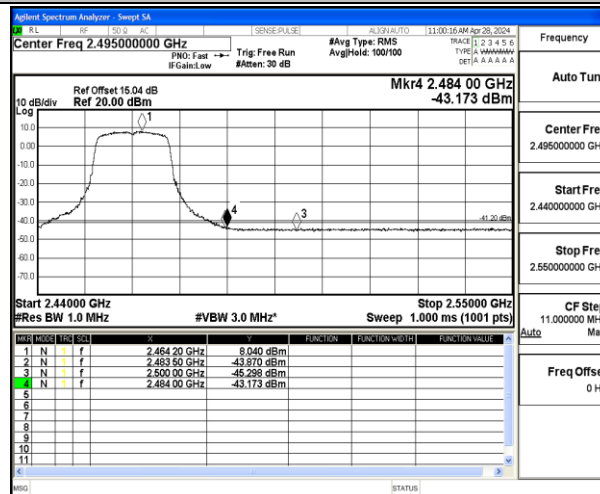
11G-Ant1-2412-PASS



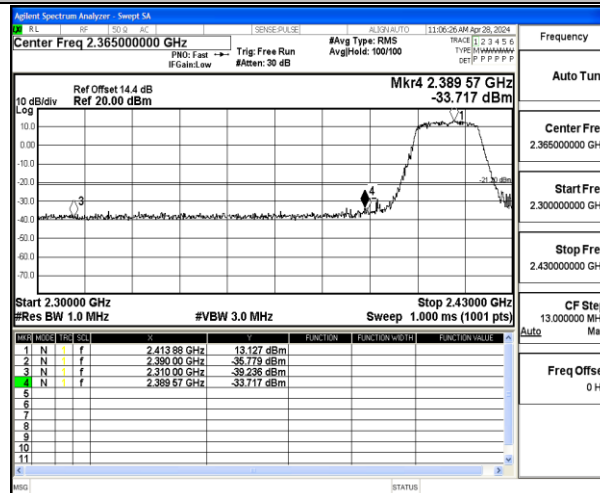
11G-Ant1-2412-PASS



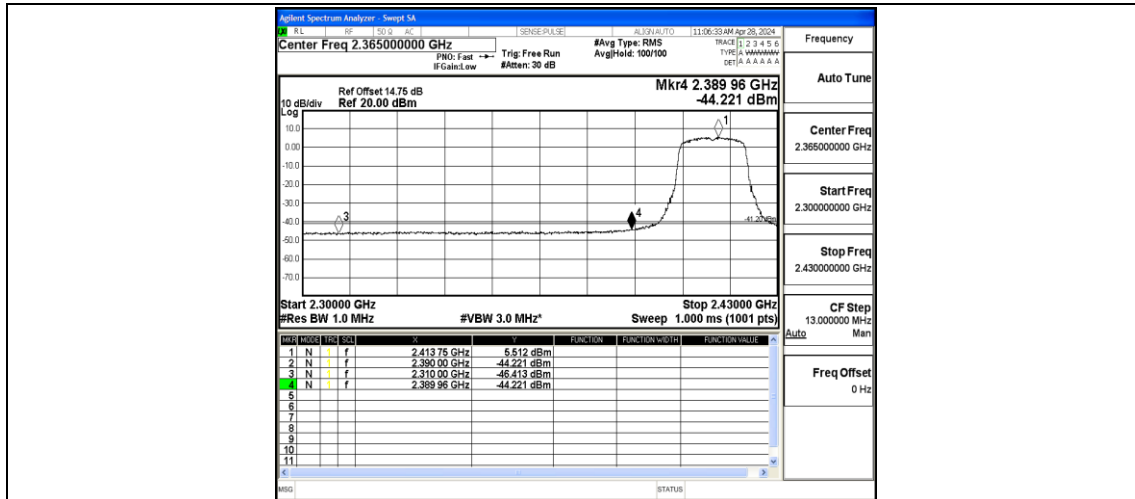
11G-Ant1-2462-PASS



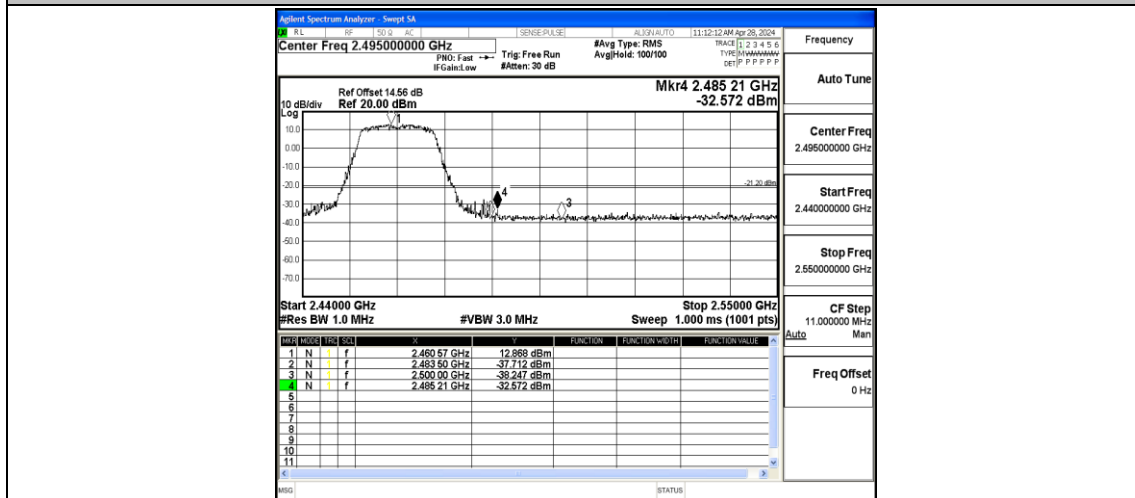
11G-Ant1-2462-PASS



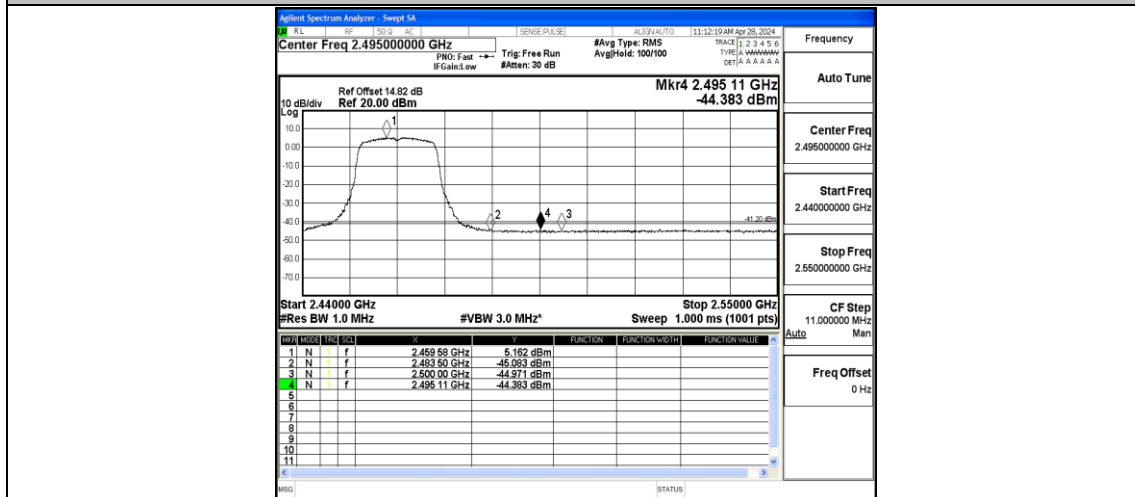
11N20SISO-Ant1-2412-PASS



11N20SISO-Ant1-2412-PASS



11N20SISO-Ant1-2462-PASS



11N20SISO-Ant1-2462-PASS