



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

Product Name: Wanbo Projector

Trade Mark: wanbo

Test Model: X7 Pro Max

FCC ID: 2A7PI-WPAA4

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	10.080	2406.960	2417.040	0.5	PASS
11B	Ant2	2412	10.080	2406.960	2417.040	0.5	PASS
11B	Ant1	2437	10.080	2431.960	2442.040	0.5	PASS
11B	Ant2	2437	10.080	2431.960	2442.040	0.5	PASS
11B	Ant1	2462	10.040	2456.960	2467.000	0.5	PASS
11B	Ant2	2462	10.080	2457.000	2467.080	0.5	PASS
11G	Ant1	2412	16.320	2403.840	2420.160	0.5	PASS
11G	Ant2	2412	16.120	2404.040	2420.160	0.5	PASS
11G	Ant1	2437	15.680	2428.840	2444.520	0.5	PASS
11G	Ant2	2437	15.280	2429.240	2444.520	0.5	PASS
11G	Ant1	2462	16.280	2453.880	2470.160	0.5	PASS
11G	Ant2	2462	16.280	2453.880	2470.160	0.5	PASS
11N20MIMO	Ant1	2412	16.720	2404.080	2420.800	0.5	PASS
11N20MIMO	Ant2	2412	16.640	2404.080	2420.720	0.5	PASS
11N20MIMO	Ant1	2437	16.360	2428.480	2444.840	0.5	PASS
11N20MIMO	Ant2	2437	16.280	2428.520	2444.800	0.5	PASS
11N20MIMO	Ant1	2462	17.240	2453.520	2470.760	0.5	PASS
11N20MIMO	Ant2	2462	16.560	2454.160	2470.720	0.5	PASS
11N40MIMO	Ant1	2422	35.280	2404.240	2439.520	0.5	PASS
11N40MIMO	Ant2	2422	35.040	2404.480	2439.520	0.5	PASS
11N40MIMO	Ant1	2437	35.120	2419.400	2454.520	0.5	PASS
11N40MIMO	Ant2	2437	35.040	2419.480	2454.520	0.5	PASS





11N40MIMO	Ant1	2452	35.680	2433.920	2469.600	0.5	PASS
11N40MIMO	Ant2	2452	36.160	2433.920	2470.080	0.5	PASS

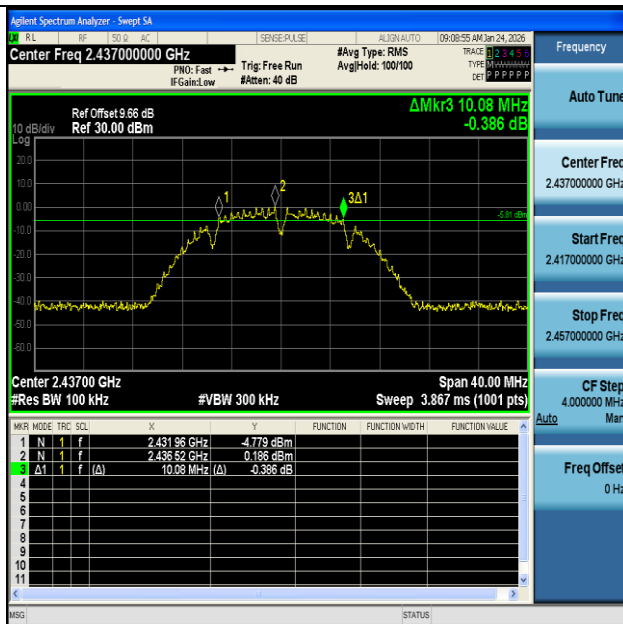
Note: offset(dB) = cable loss(dB) + attenuator factor(dB)



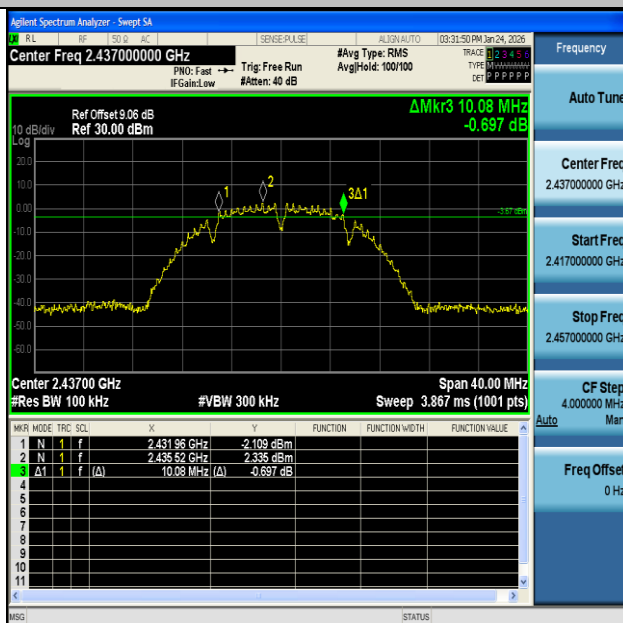


Test Graphs



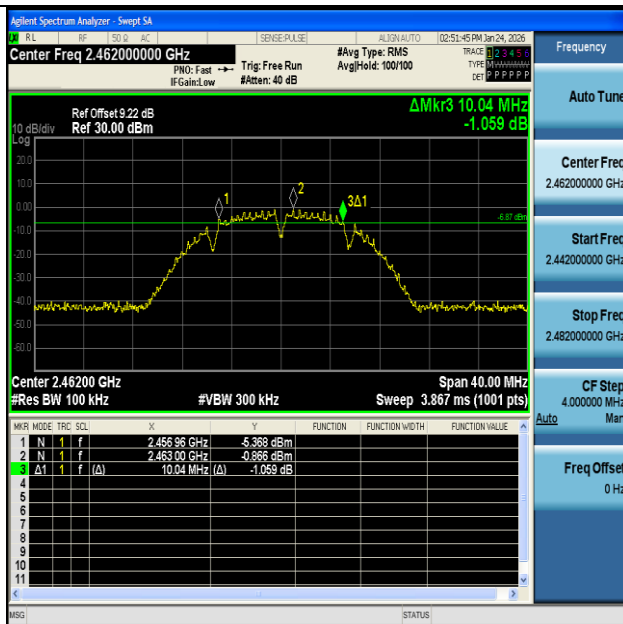


11B-Ant1-2437-PASS



11B-Ant2-2437-PASS



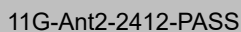
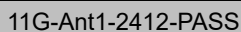


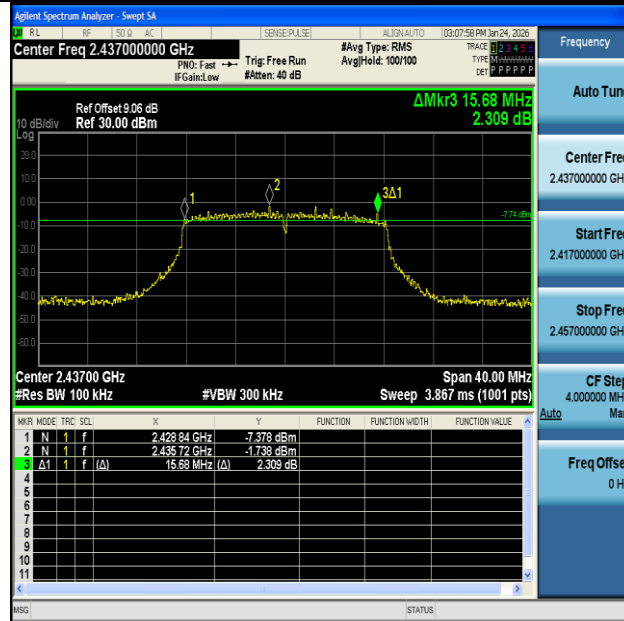
11B-Ant1-2462-PASS



11B-Ant2-2462-PASS







11G-Ant1-2437-PASS



11G-Ant2-2437-PASS



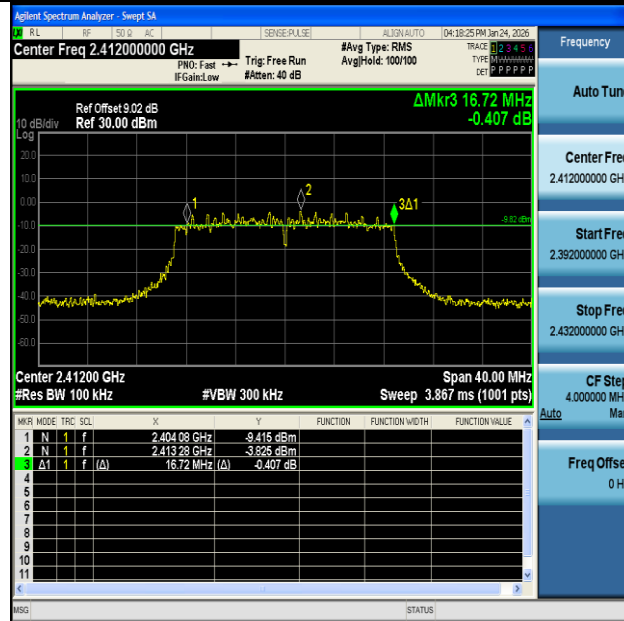


11G-Ant1-2462-PASS

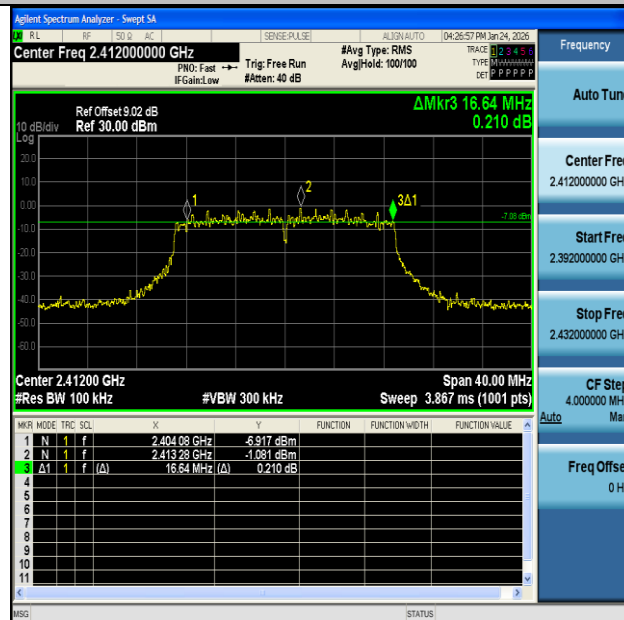


11G-Ant2-2462-PASS



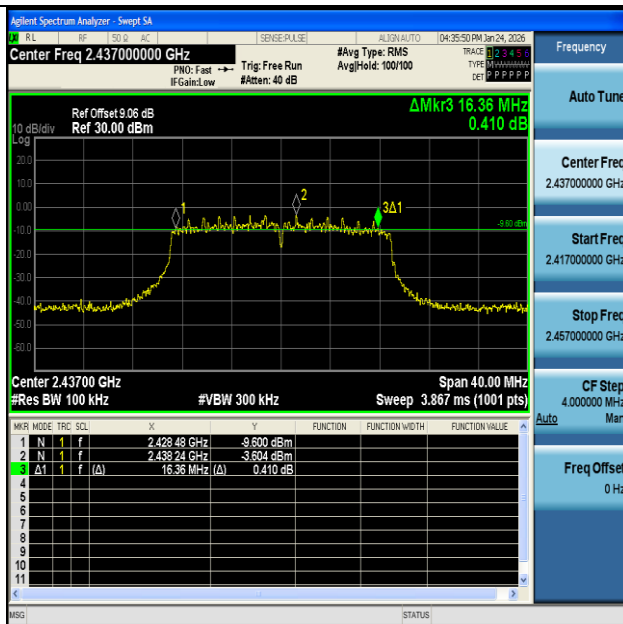


11N20MIMO-Ant1-2412-PASS

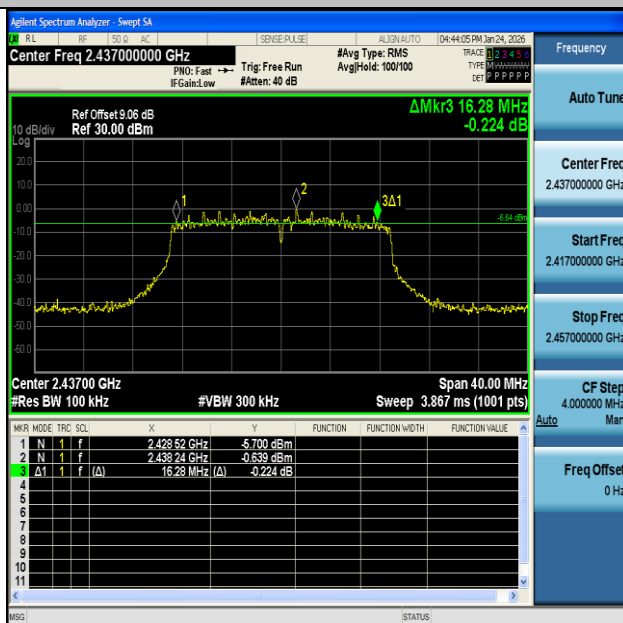


11N20MIMO-Ant2-2412-PASS



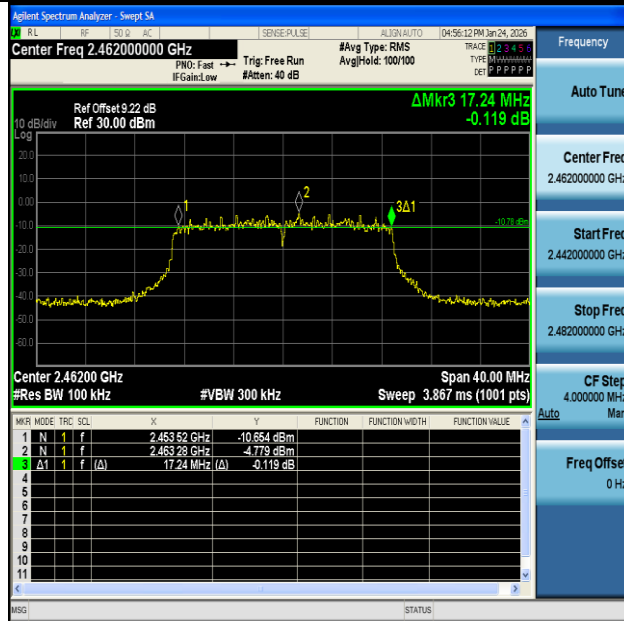


11N20MIMO-Ant1-2437-PASS

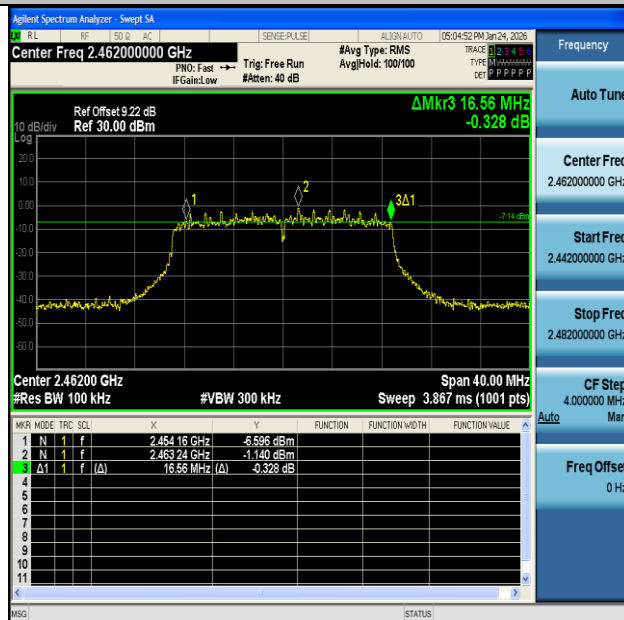


11N20MIMO-Ant2-2437-PASS



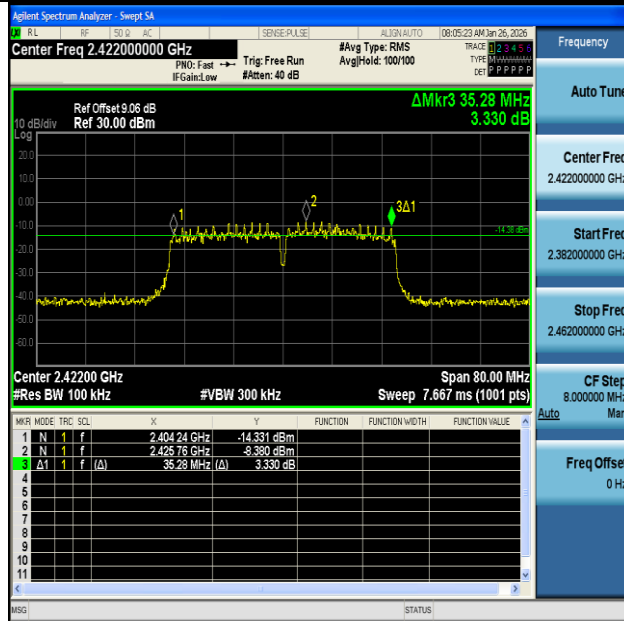


11N20MIMO-Ant1-2462-PASS

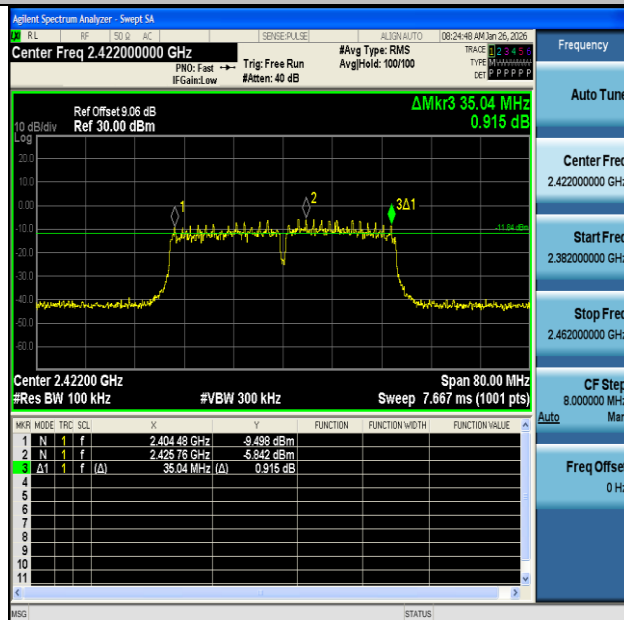


11N20MIMO-Ant2-2462-PASS



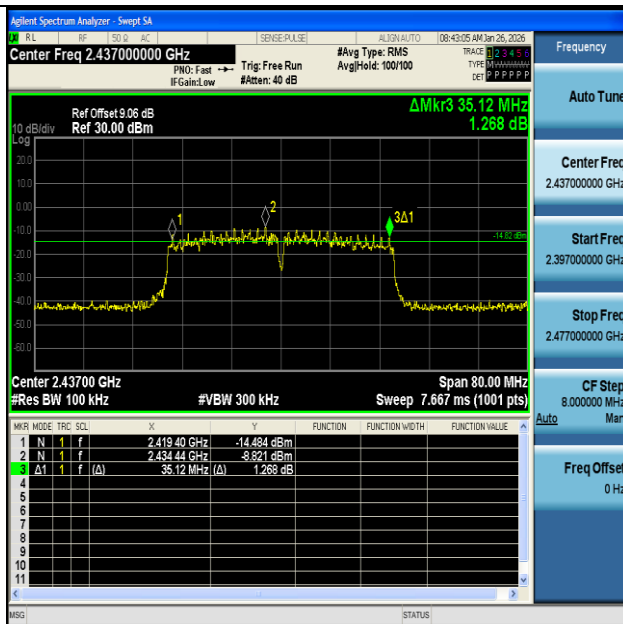


11N40MIMO-Ant1-2422-PASS

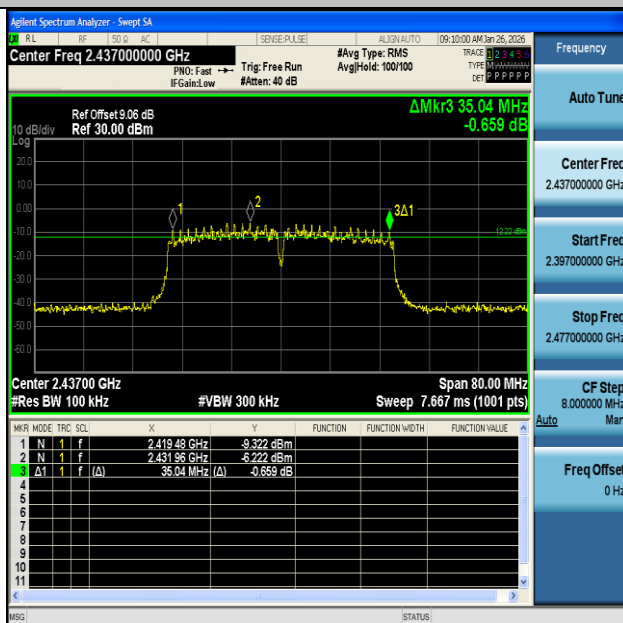


11N40MIMO-Ant2-2422-PASS



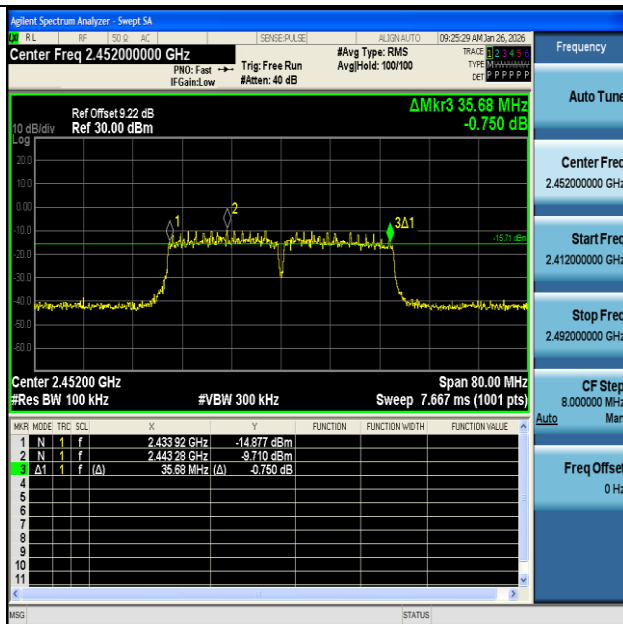


11N40MIMO-Ant1-2437-PASS

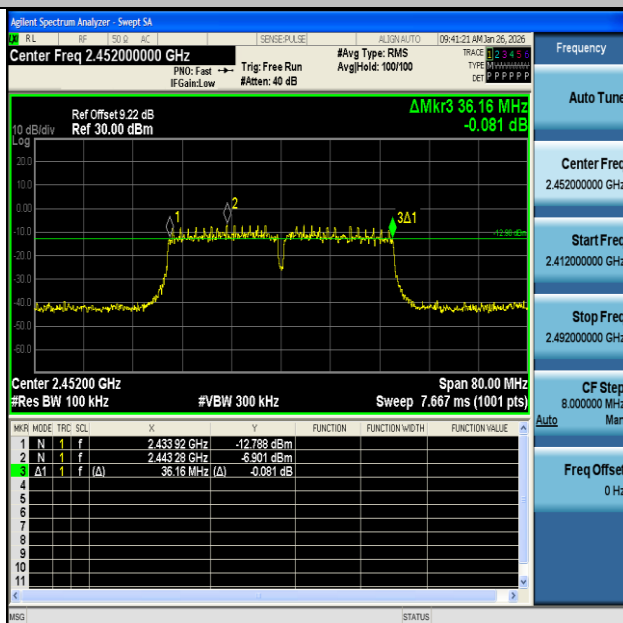


11N40MIMO-Ant2-2437-PASS





11N40MIMO-Ant1-2452-PASS



11N40MIMO-Ant2-2452-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	14.932	2404.5353	2419.4673	---	---
11B	Ant2	2412	14.938	2404.5536	2419.4916	---	---
11B	Ant1	2437	14.688	2429.5852	2444.2732	---	---
11B	Ant2	2437	14.704	2429.5824	2444.2864	---	---
11B	Ant1	2462	14.882	2454.6285	2469.5105	---	---
11B	Ant2	2462	14.845	2454.6630	2469.5080	---	---
11G	Ant1	2412	16.644	2403.6982	2420.3422	---	---
11G	Ant2	2412	16.855	2403.5982	2420.4532	---	---
11G	Ant1	2437	16.592	2428.7119	2445.3039	---	---
11G	Ant2	2437	16.766	2428.6252	2445.3912	---	---
11G	Ant1	2462	16.586	2453.7605	2470.3465	---	---
11G	Ant2	2462	16.775	2453.6462	2470.4212	---	---
11N20MIMO	Ant1	2412	17.827	2403.1524	2420.9794	---	---
11N20MIMO	Ant2	2412	17.903	2403.1252	2421.0282	---	---
11N20MIMO	Ant1	2437	17.751	2428.0790	2445.8300	---	---
11N20MIMO	Ant2	2437	17.757	2428.0703	2445.8273	---	---
11N20MIMO	Ant1	2462	17.745	2453.2216	2470.9666	---	---
11N20MIMO	Ant2	2462	17.729	2453.2108	2470.9398	---	---
11N40MIMO	Ant1	2422	36.226	2403.8776	2440.1036	---	---
11N40MIMO	Ant2	2422	36.248	2403.9202	2440.1682	---	---
11N40MIMO	Ant1	2437	36.211	2418.8709	2455.0819	---	---
11N40MIMO	Ant2	2437	36.129	2418.9418	2455.0708	---	---
11N40MIMO	Ant1	2452	36.552	2433.6973	2470.2493	---	---
11N40MIMO	Ant2	2452	36.411	2433.8464	2470.2574	---	---

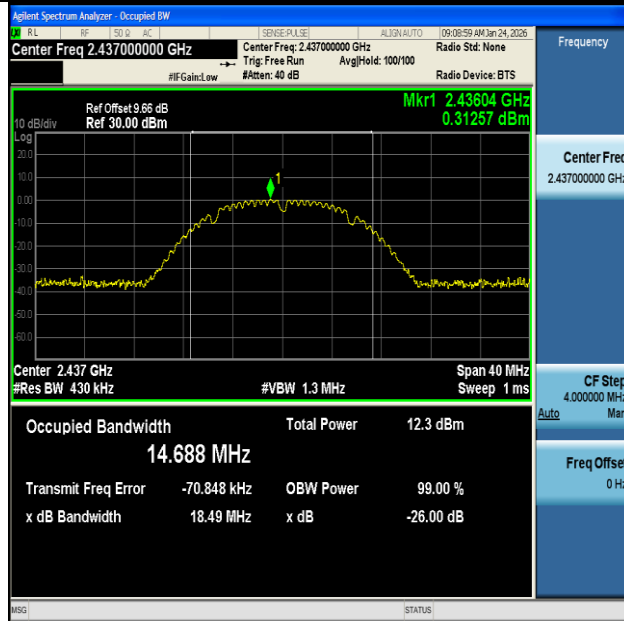
Note: offset(dB) = cable loss(dB) + attenuator factor(dB)



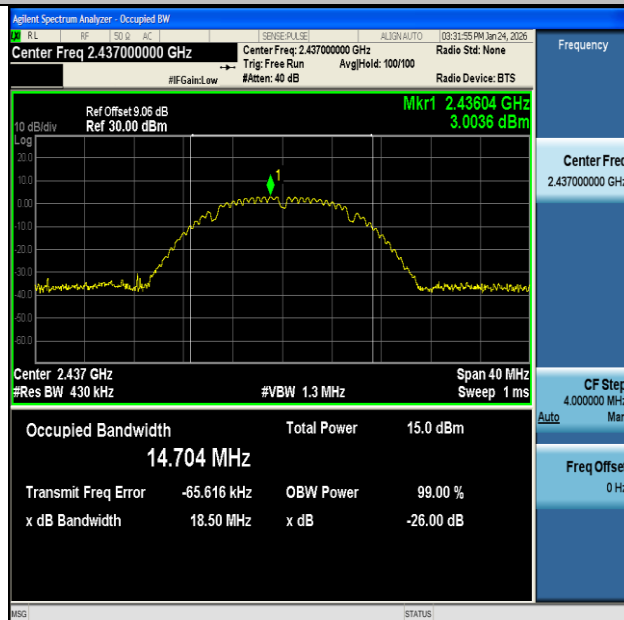


Test Graphs



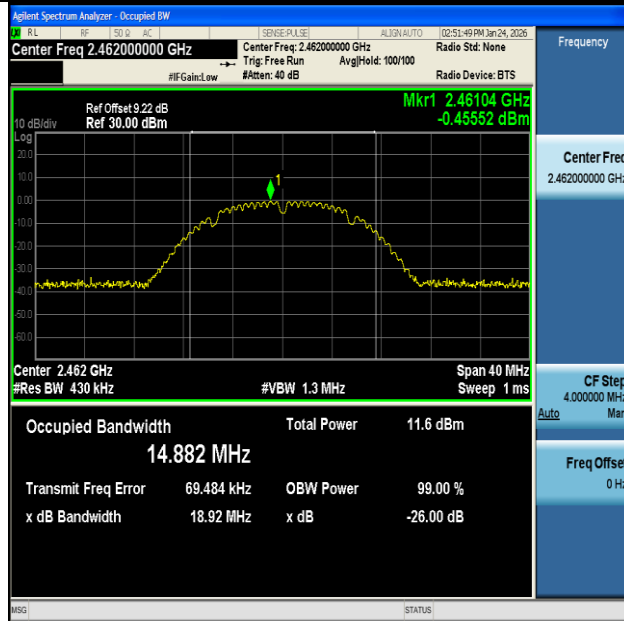


11B-Ant1-2437

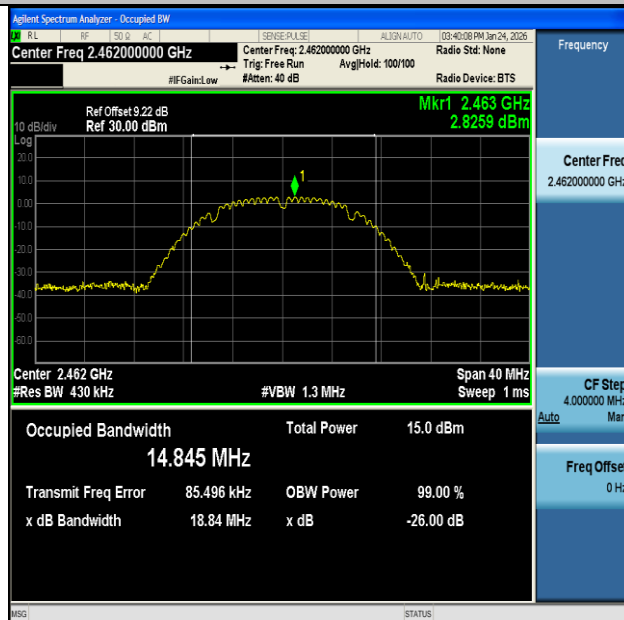


11B-Ant2-2437



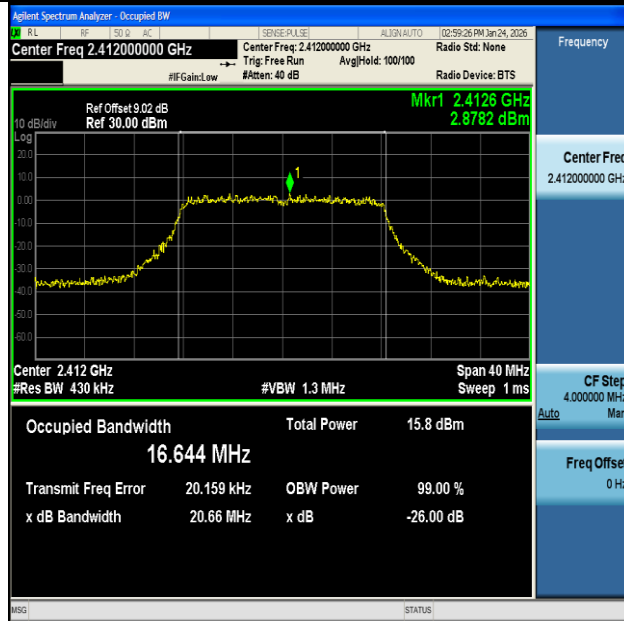


11B-Ant1-2462

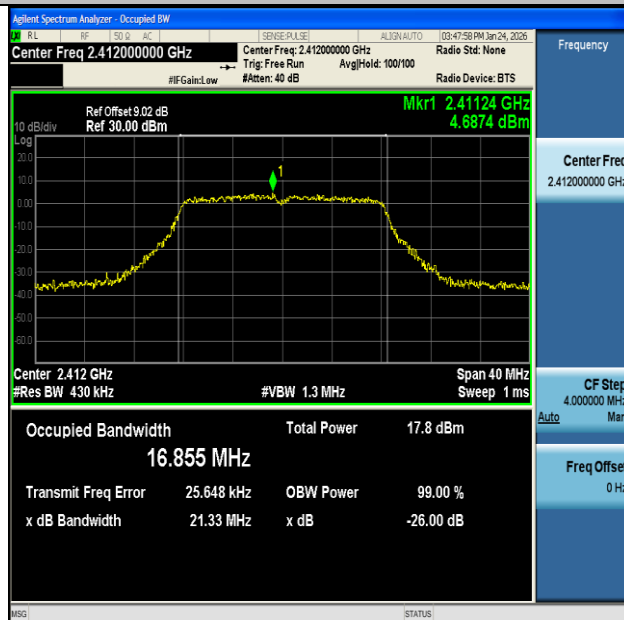


11B-Ant2-2462



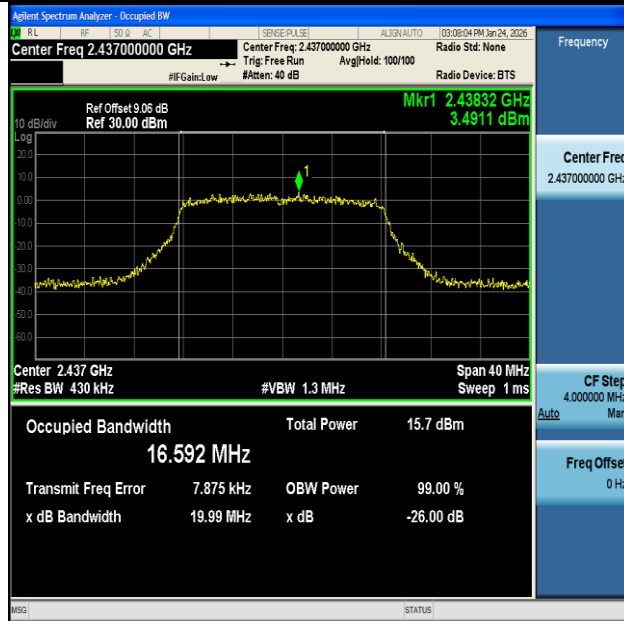


11G-Ant1-2412

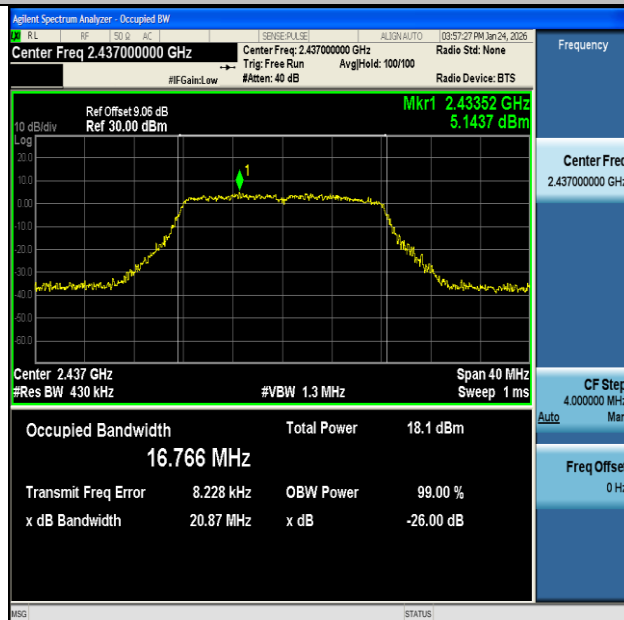


11G-Ant2-2412





11G-Ant1-2437

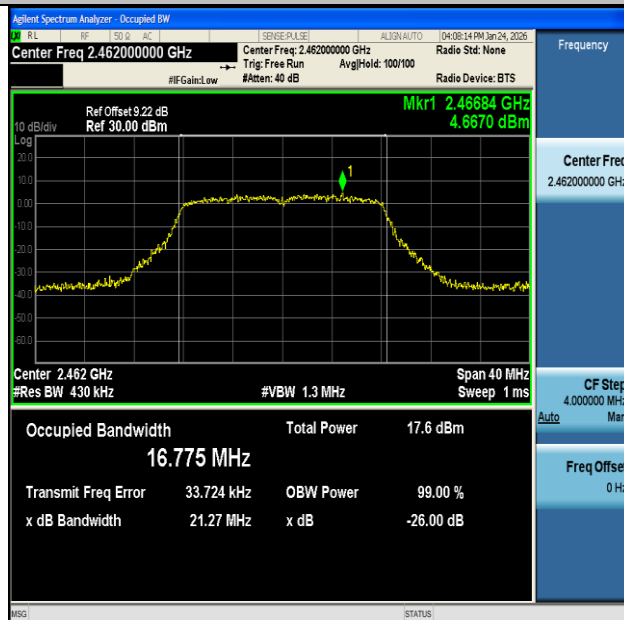


11G-Ant2-2437



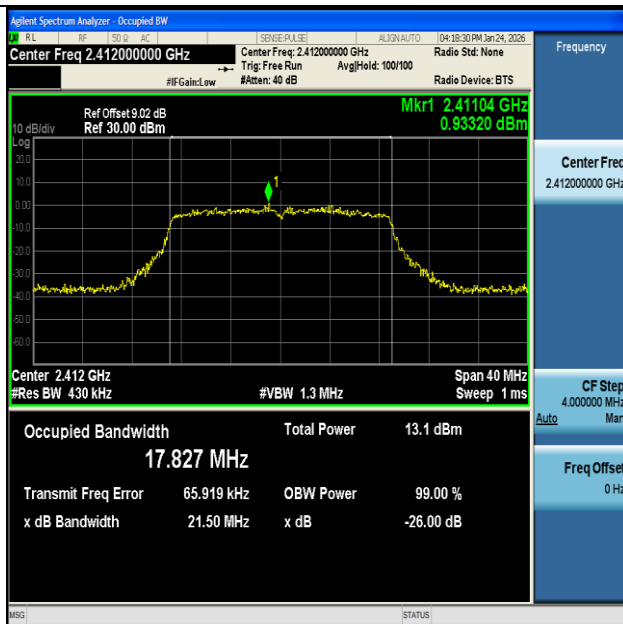


11G-Ant1-2462

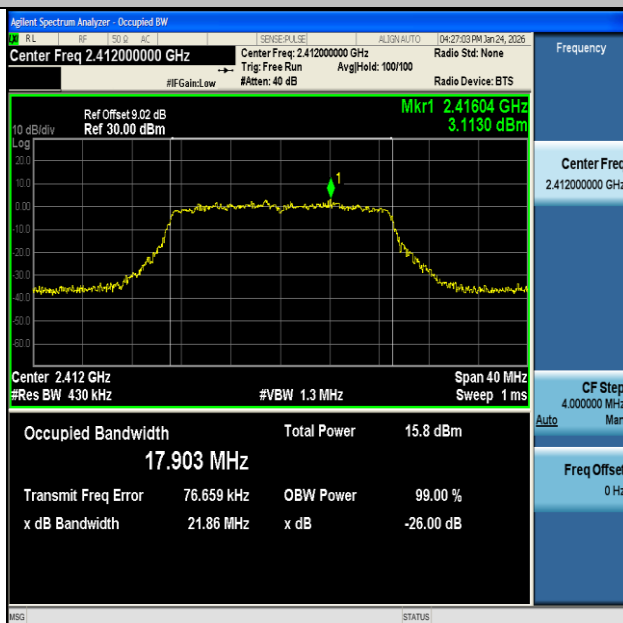


11G-Ant2-2462



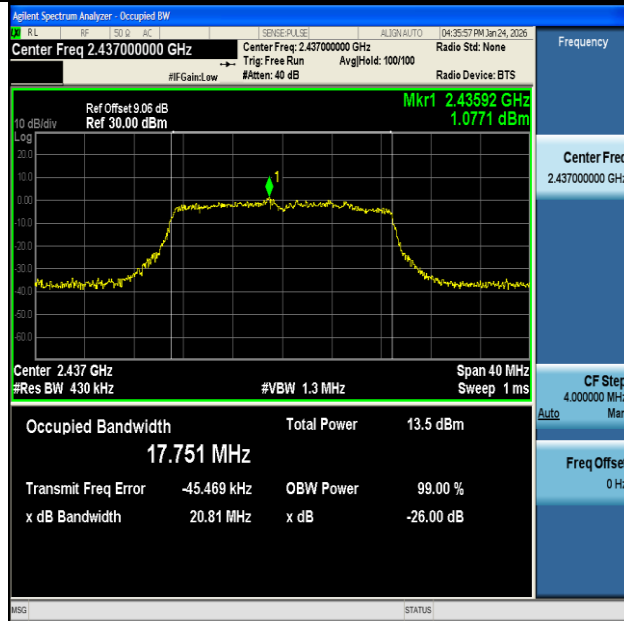


11N20MIMO-Ant1-2412

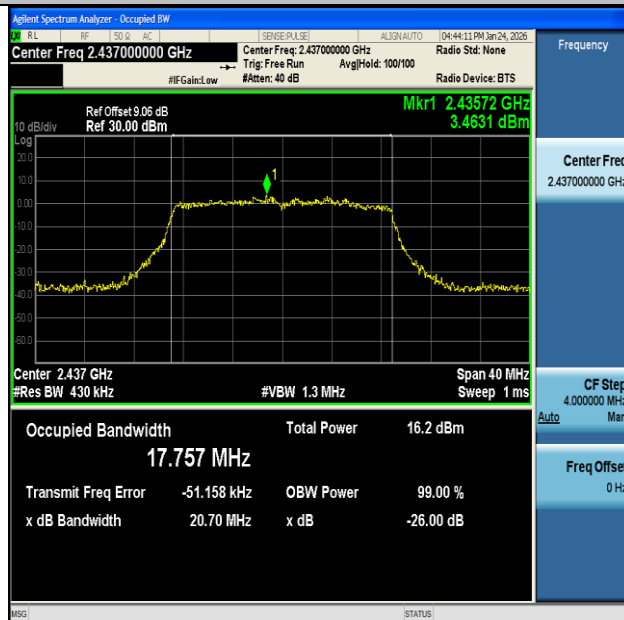


11N20MIMO-Ant2-2412



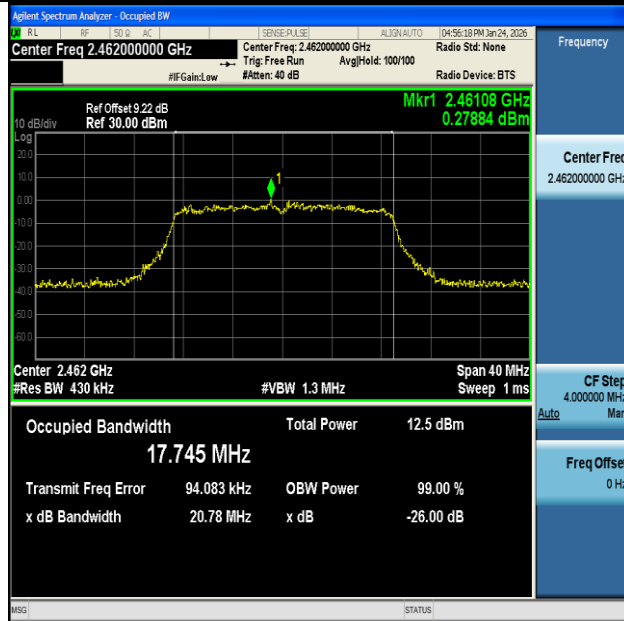


11N20MIMO-Ant1-2437

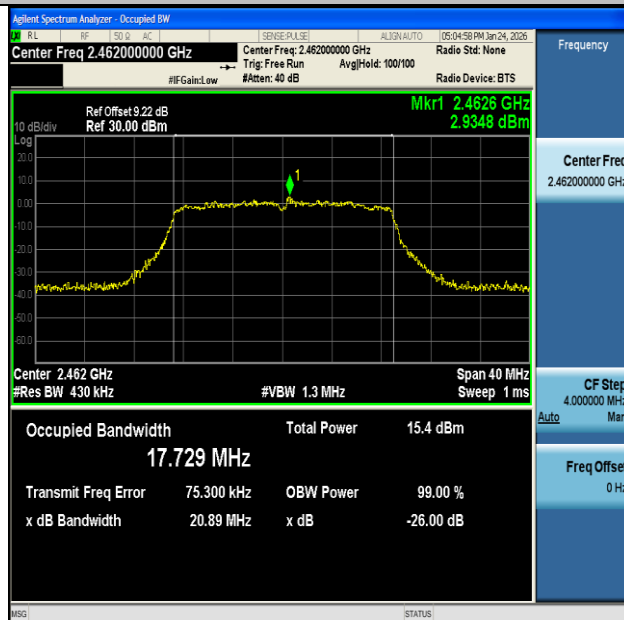


11N20MIMO-Ant2-2437



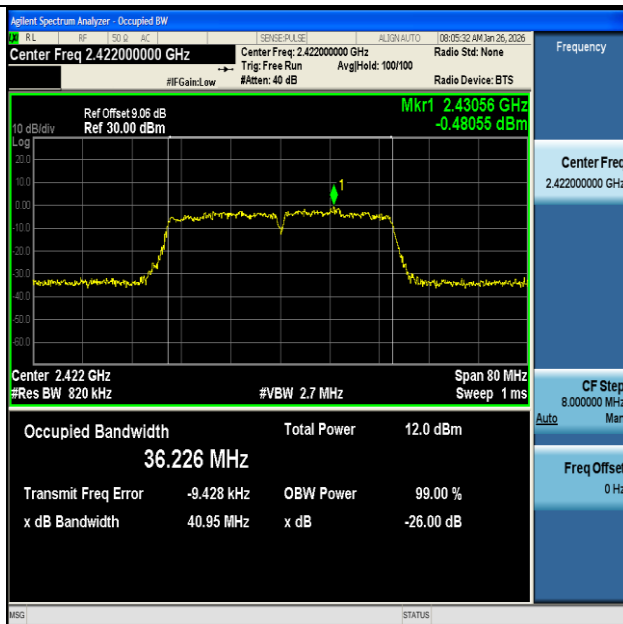


11N20MIMO-Ant1-2462

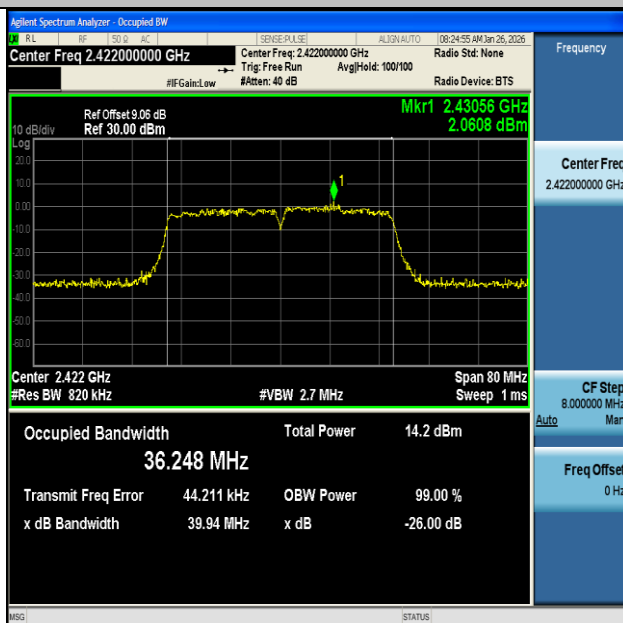


11N20MIMO-Ant2-2462



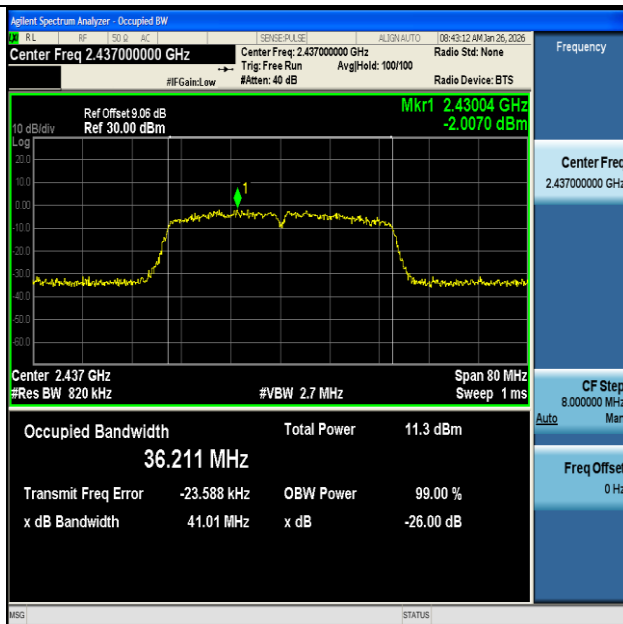


11N40MIMO-Ant1-2422

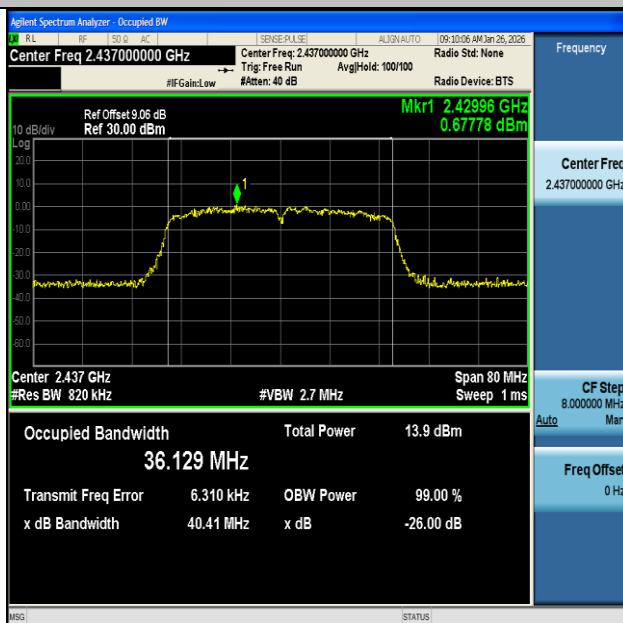


11N40MIMO-Ant2-2422



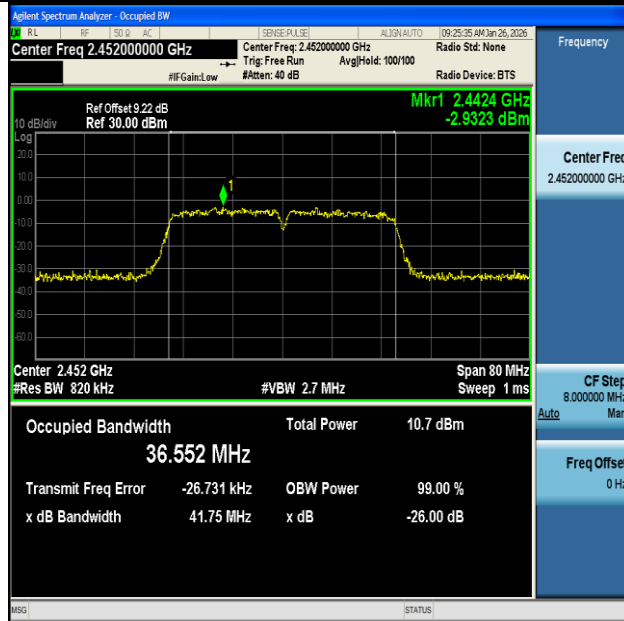


11N40MIMO-Ant1-2437

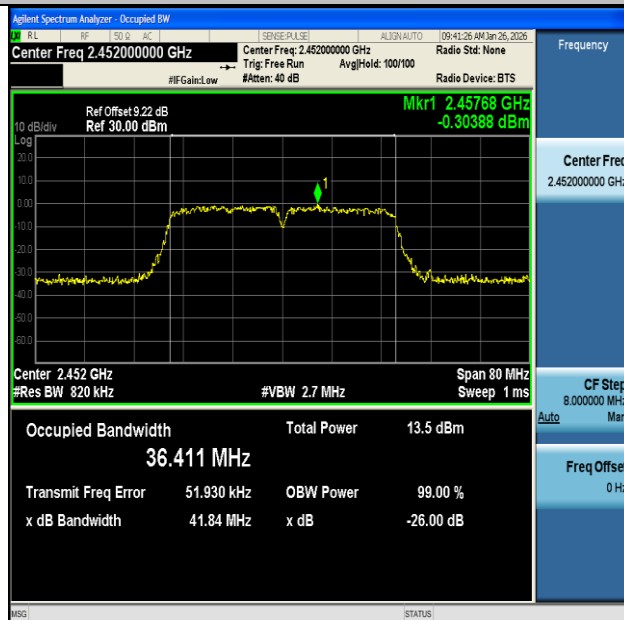


11N40MIMO-Ant2-2437





11N40MIMO-Ant1-2452



11N40MIMO-Ant2-2452





Appendix C: Maximum Average conducted output power

Test Result

Test Mode	Antenna	Frequency [MHz]	Conducted Power [dBm]	Conducted Limit [dBm]	Verdict
11B	Ant1	2412	8.82	≤30.00	PASS
11B	Ant2	2412	11.68	≤30.00	PASS
11B	Ant1	2437	9.37	≤30.00	PASS
11B	Ant2	2437	12.05	≤30.00	PASS
11B	Ant1	2462	8.57	≤30.00	PASS
11B	Ant2	2462	12.10	≤30.00	PASS
11G	Ant1	2412	9.53	≤30.00	PASS
11G	Ant2	2412	11.85	≤30.00	PASS
11G	Ant1	2437	9.67	≤30.00	PASS
11G	Ant2	2437	12.22	≤30.00	PASS
11G	Ant1	2462	8.48	≤30.00	PASS
11G	Ant2	2462	11.92	≤30.00	PASS
11N20MIMO	Ant1	2412	8.05	≤30.00	PASS
11N20MIMO	Ant2	2412	10.62	≤30.00	PASS
11N20MIMO	total	2412	12.53	≤30.00	PASS
11N20MIMO	Ant1	2437	8.32	≤30.00	PASS
11N20MIMO	Ant2	2437	10.96	≤30.00	PASS
11N20MIMO	total	2437	12.85	≤30.00	PASS
11N20MIMO	Ant1	2462	7.40	≤30.00	PASS
11N20MIMO	Ant2	2462	10.42	≤30.00	PASS
11N20MIMO	total	2462	12.18	≤30.00	PASS
11N40MIMO	Ant1	2422	6.43	≤30.00	PASS
11N40MIMO	Ant2	2422	8.55	≤30.00	PASS
11N40MIMO	total	2422	10.63	≤30.00	PASS
11N40MIMO	Ant1	2437	5.76	≤30.00	PASS
11N40MIMO	Ant2	2437	7.99	≤30.00	PASS
11N40MIMO	total	2437	10.03	≤30.00	PASS
11N40MIMO	Ant1	2452	5.49	≤30.00	PASS
11N40MIMO	Ant2	2452	8.14	≤30.00	PASS
11N40MIMO	total	2452	10.02	≤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

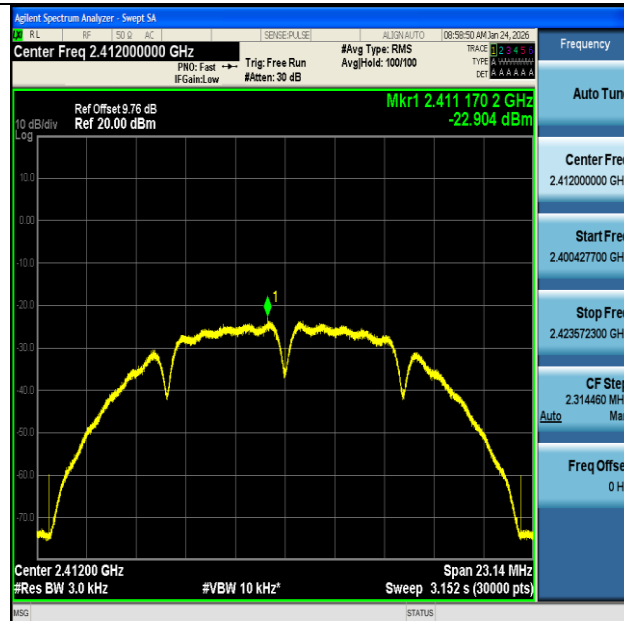
Test Mode	Antenna	Frequency [MHz]	Result [dBm/3kHz]	Limit [dBm/3kHz]	Verdict
11B	Ant1	2412	-22.90	≤8.00	PASS
11B	Ant2	2412	-20.83	≤8.00	PASS
11B	Ant1	2437	-23.24	≤8.00	PASS
11B	Ant2	2437	-20.23	≤8.00	PASS
11B	Ant1	2462	-24.18	≤8.00	PASS
11B	Ant2	2462	-20.56	≤8.00	PASS
11G	Ant1	2412	-22.47	≤8.00	PASS
11G	Ant2	2412	-19.30	≤8.00	PASS
11G	Ant1	2437	-21.69	≤8.00	PASS
11G	Ant2	2437	-18.99	≤8.00	PASS
11G	Ant1	2462	-22.18	≤8.00	PASS
11G	Ant2	2462	-19.50	≤8.00	PASS
11N20MIMO	Ant1	2412	-19.08	≤8.00	PASS
11N20MIMO	Ant2	2412	-16.48	≤8.00	PASS
11N20MIMO	total	2412	-14.58	≤7.41	PASS
11N20MIMO	Ant1	2437	-19.28	≤8.00	PASS
11N20MIMO	Ant2	2437	-16.65	≤8.00	PASS
11N20MIMO	total	2437	-14.76	≤7.41	PASS
11N20MIMO	Ant1	2462	-20.52	≤8.00	PASS
11N20MIMO	Ant2	2462	-17.21	≤8.00	PASS
11N20MIMO	total	2462	-15.55	≤7.41	PASS
11N40MIMO	Ant1	2422	-23.72	≤8.00	PASS
11N40MIMO	Ant2	2422	-19.23	≤8.00	PASS
11N40MIMO	total	2422	-17.91	≤7.41	PASS
11N40MIMO	Ant1	2437	-22.37	≤8.00	PASS
11N40MIMO	Ant2	2437	-20.92	≤8.00	PASS
11N40MIMO	total	2437	-18.57	≤7.41	PASS
11N40MIMO	Ant1	2452	-24.65	≤8.00	PASS
11N40MIMO	Ant2	2452	-21.87	≤8.00	PASS
11N40MIMO	total	2452	-20.03	≤7.41	PASS

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

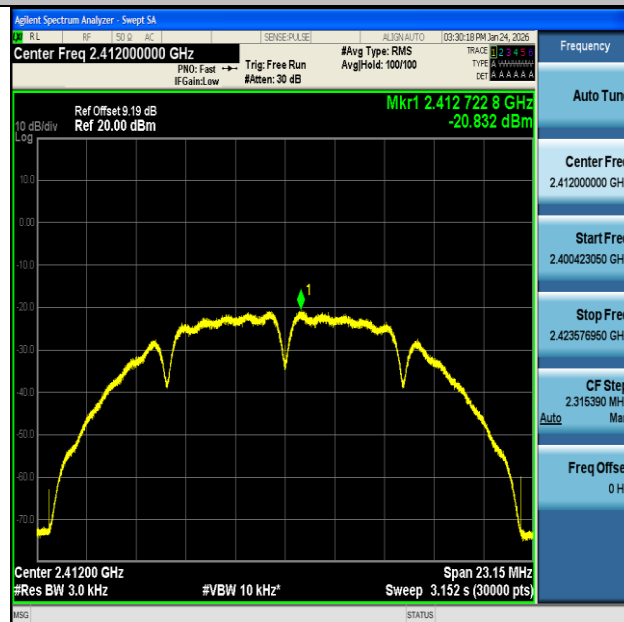




Test Graphs

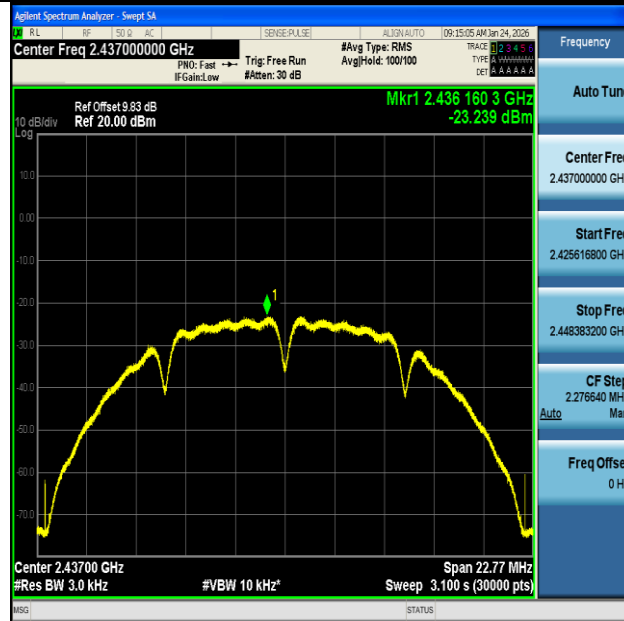


11B-Ant1-2412-PASS

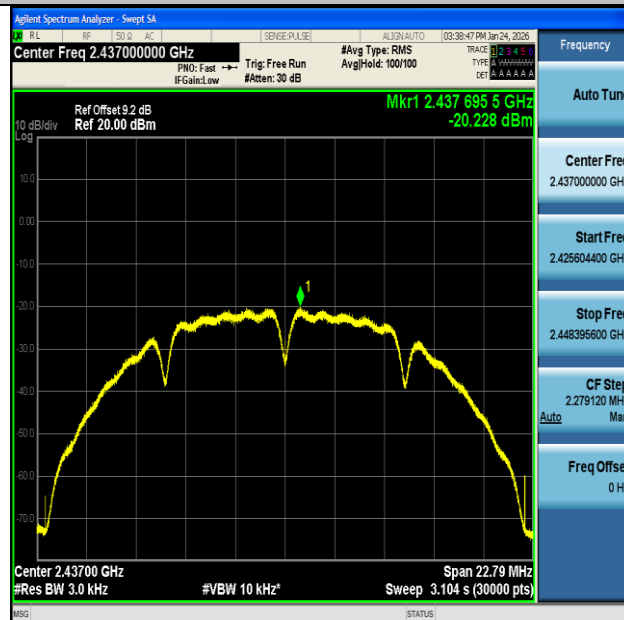


11B-Ant2-2412-PASS



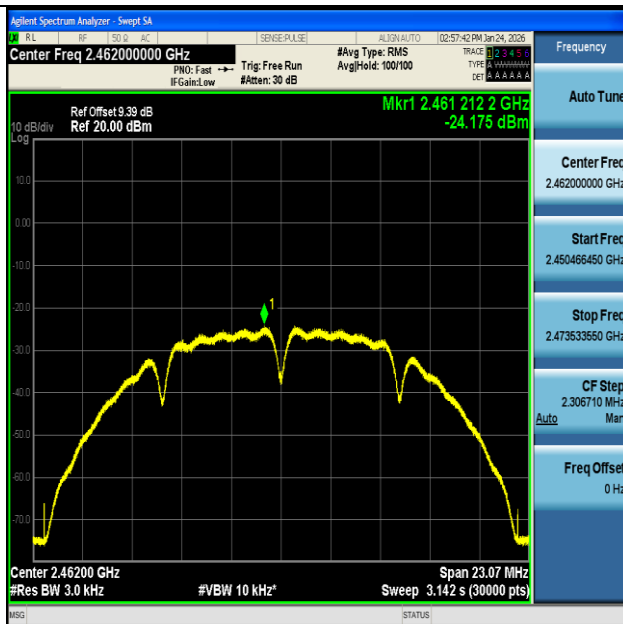


11B-Ant1-2437-PASS

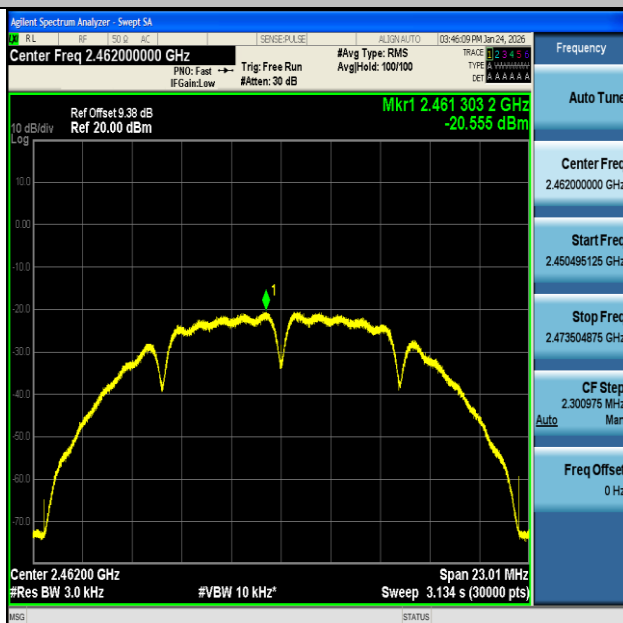


11B-Ant2-2437-PASS



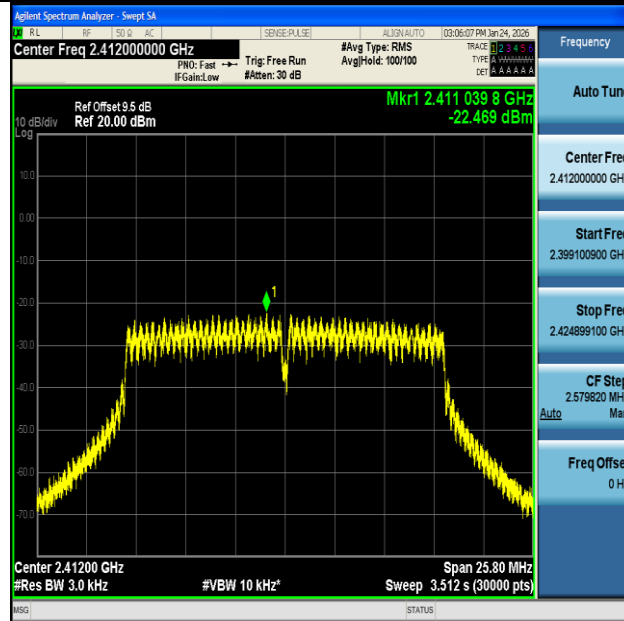


11B-Ant1-2462-PASS

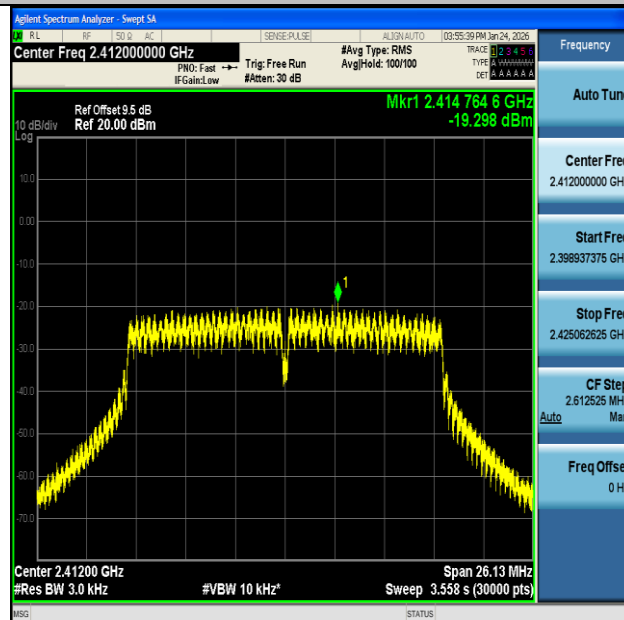


11B-Ant2-2462-PASS



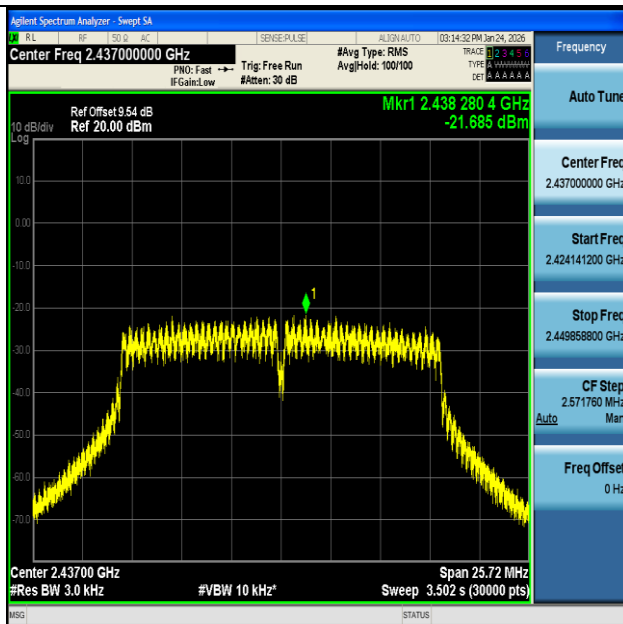


11G-Ant1-2412-PASS

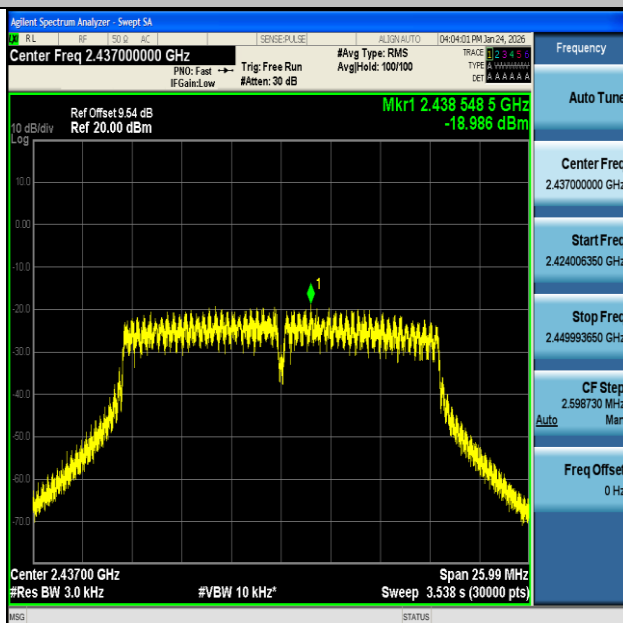


11G-Ant2-2412-PASS



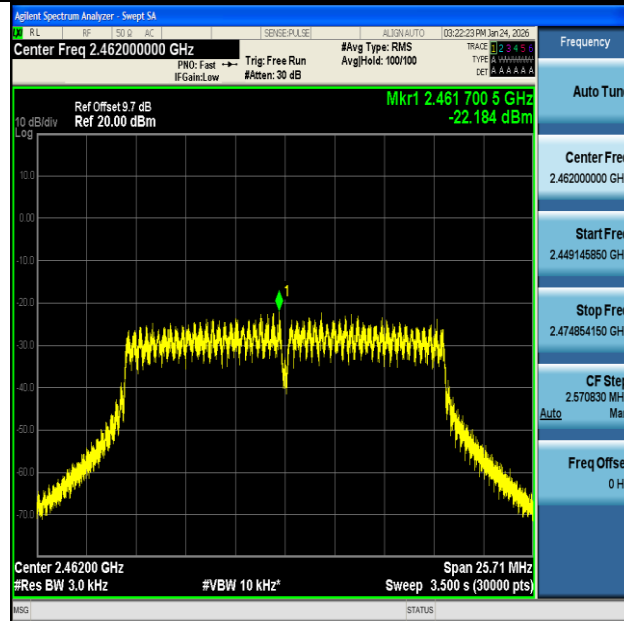


11G-Ant1-2437-PASS

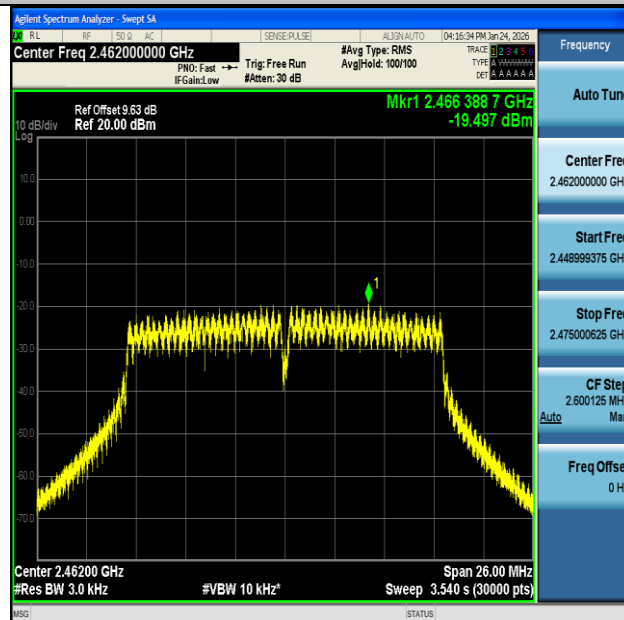


11G-Ant2-2437-PASS



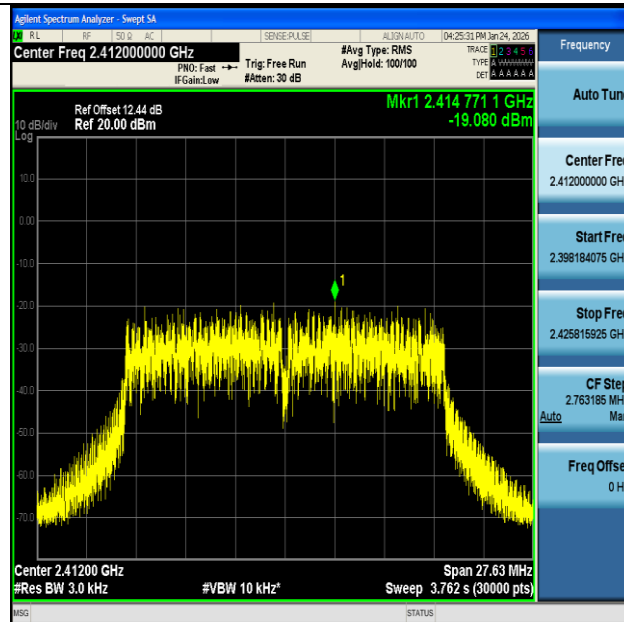


11G-Ant1-2462-PASS

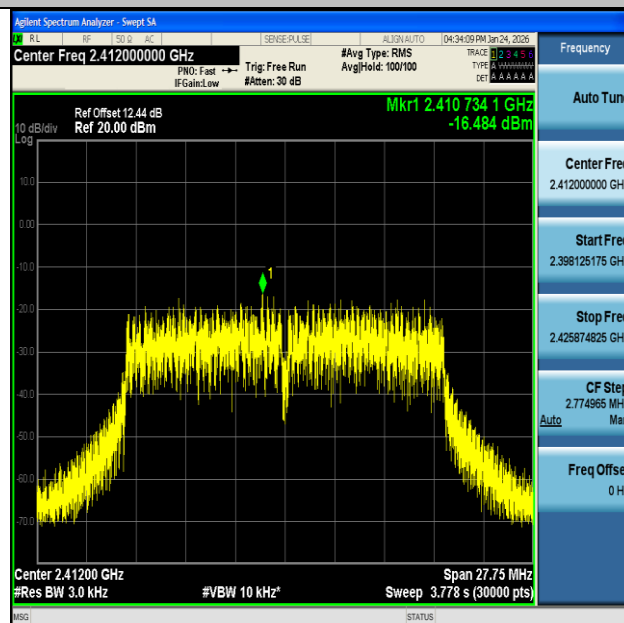


11G-Ant2-2462-PASS



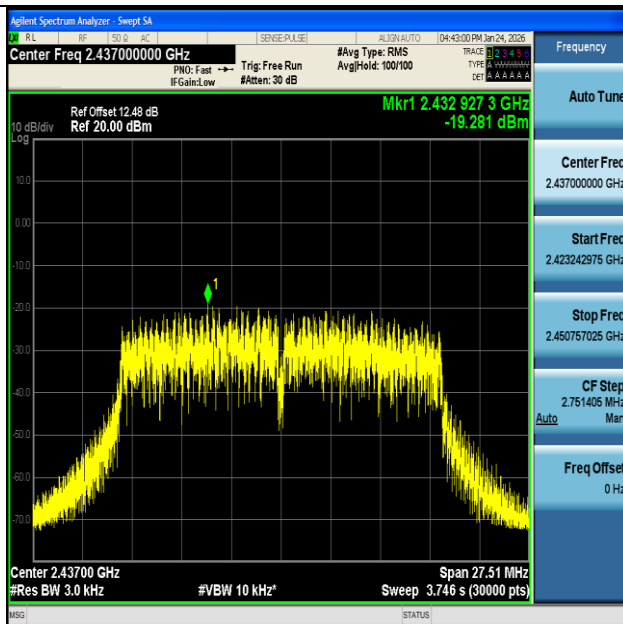


11N20MIMO-Ant1-2412-PASS

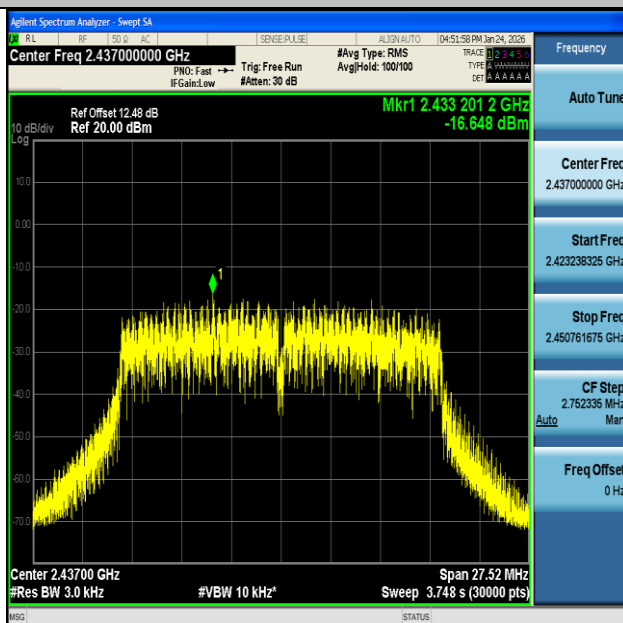


11N20MIMO-Ant2-2412-PASS



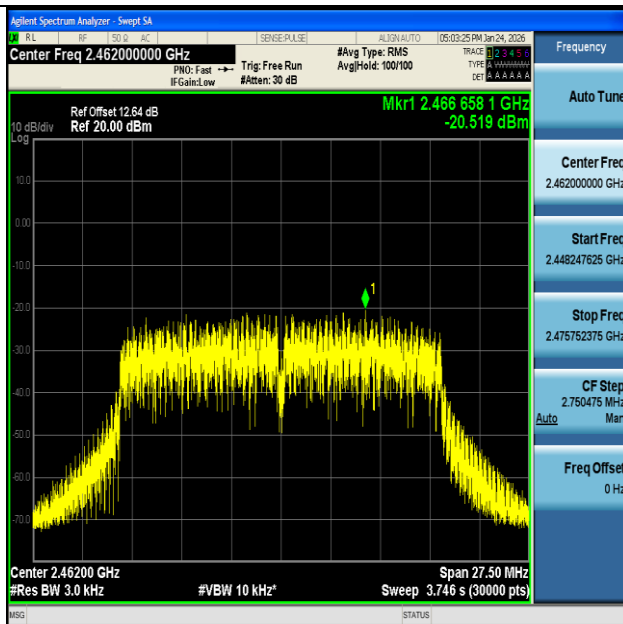


11N20MIMO-Ant1-2437-PASS

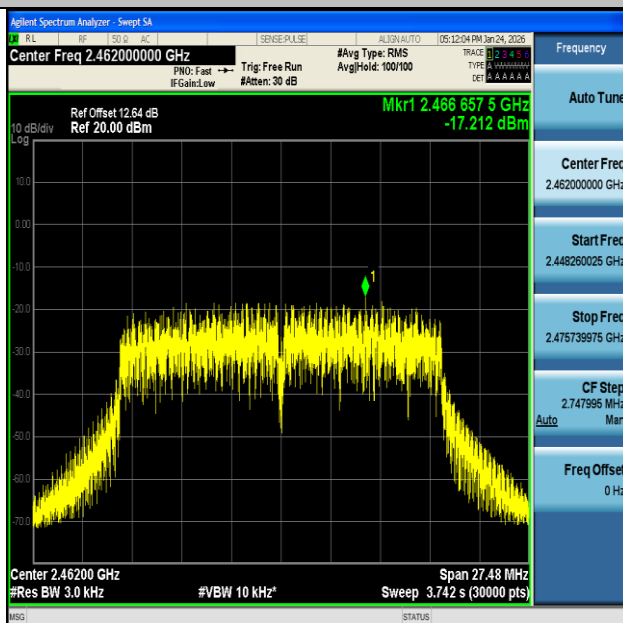


11N20MIMO-Ant2-2437-PASS



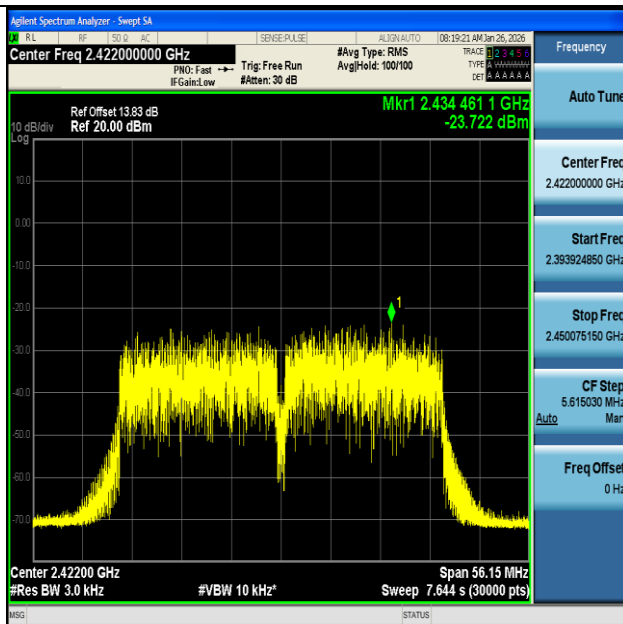


11N20MIMO-Ant1-2462-PASS

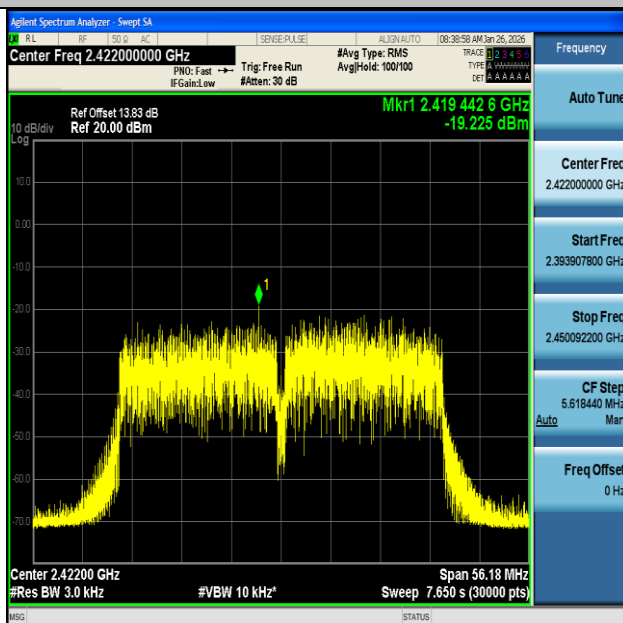


11N20MIMO-Ant2-2462-PASS



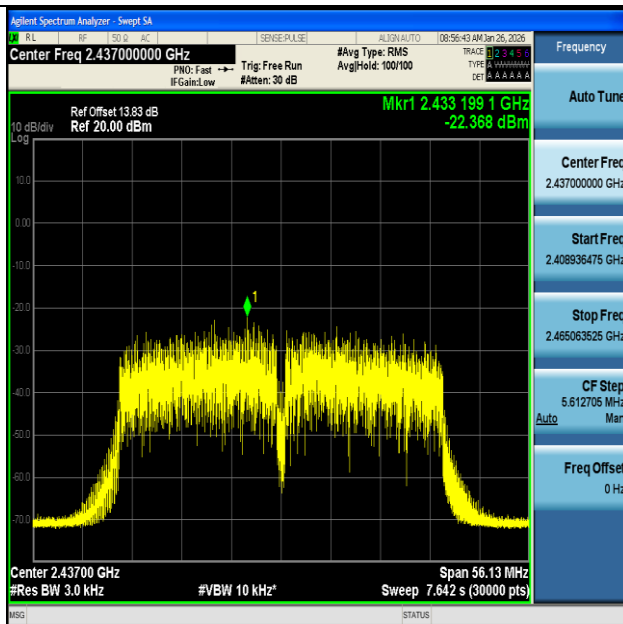


11N40MIMO-Ant1-2422-PASS

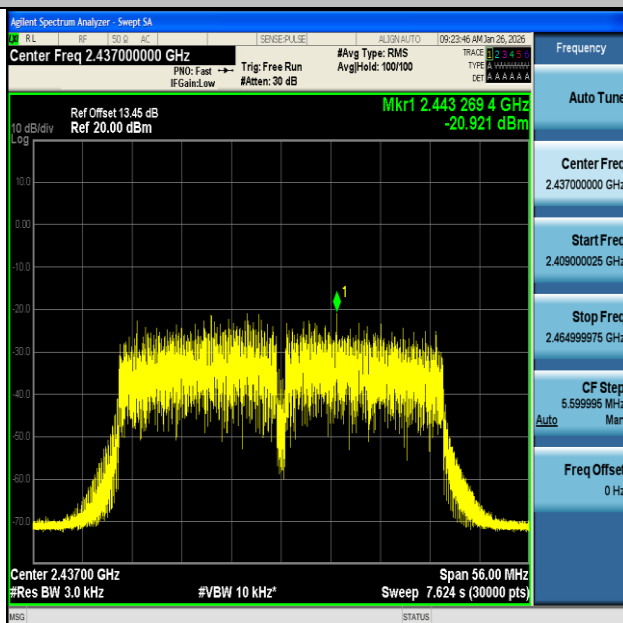


11N40MIMO-Ant2-2422-PASS



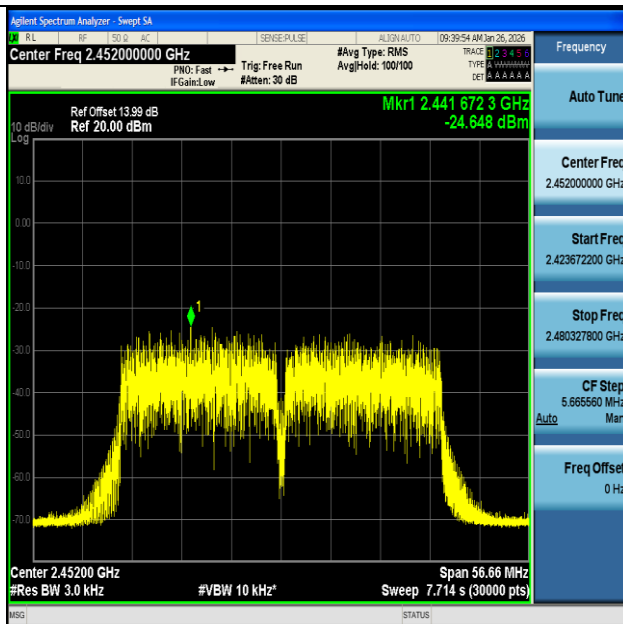


11N40MIMO-Ant1-2437-PASS

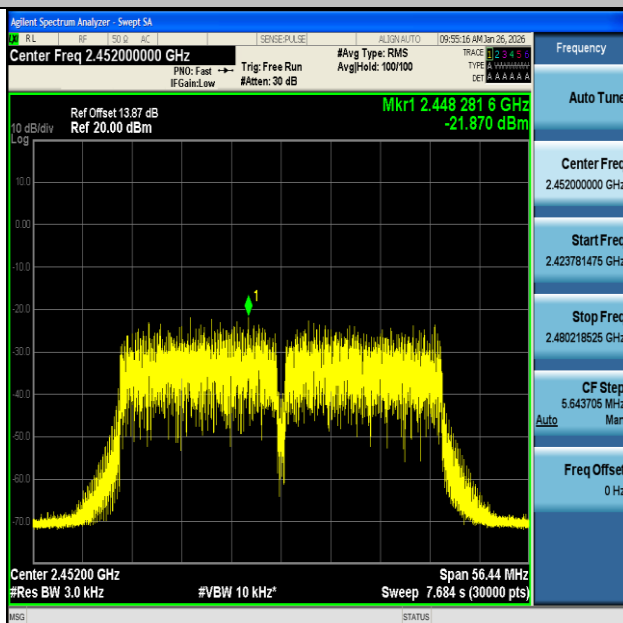


11N40MIMO-Ant2-2437-PASS





11N40MIMO-Ant1-2452-PASS



11N40MIMO-Ant2-2452-PASS





Appendix E: Band edge measurements

Test Result

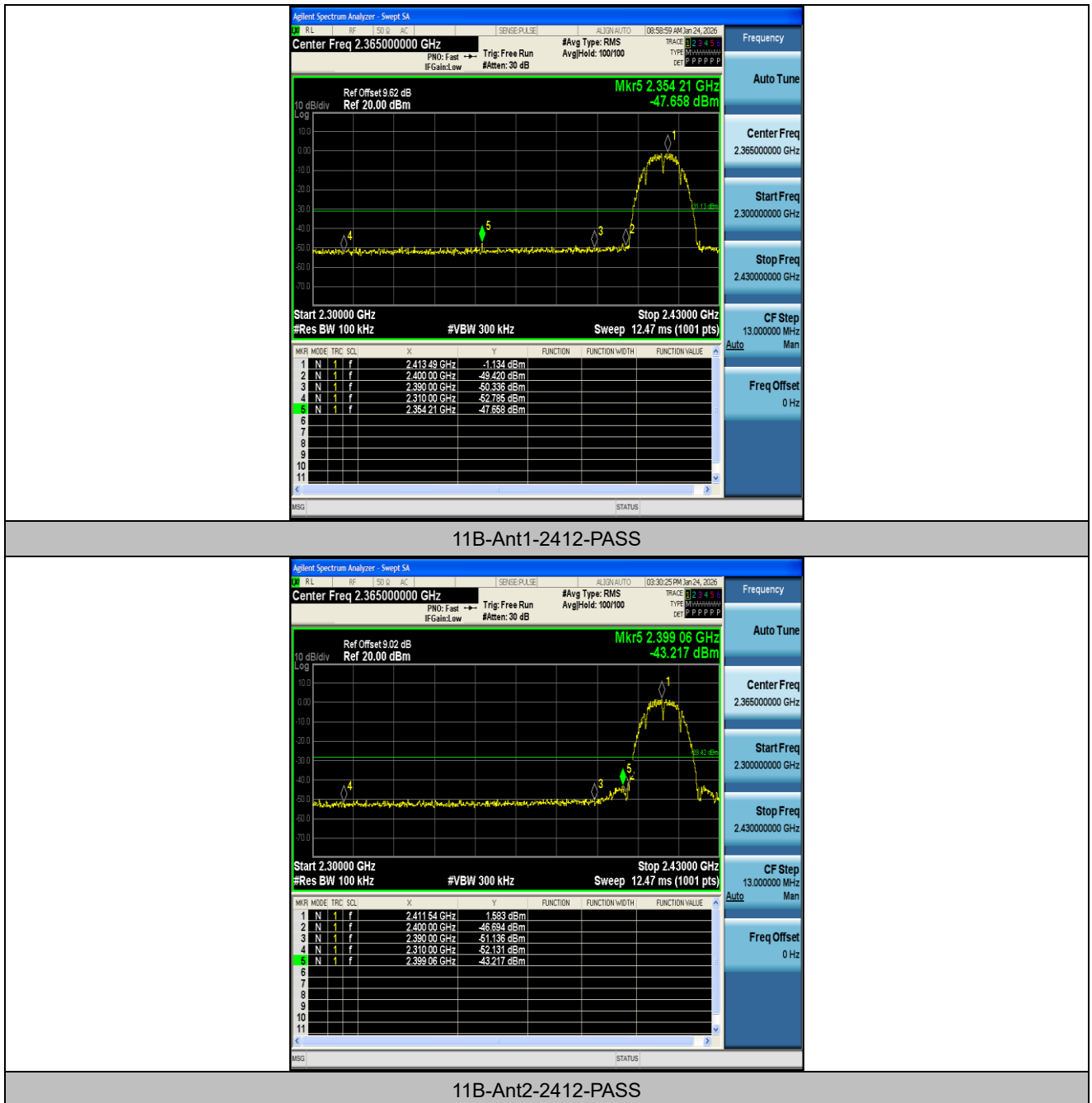
Test Mode	Antenna	Ch. Name	Frequency.[MHz]	Ref. Level [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	Low	2412	-1.13	-47.66	≤ -31.13	PASS
11B	Ant2	Low	2412	1.58	-43.22	≤ -28.42	PASS
11B	Ant1	High	2462	-2.25	-48.22	≤ -32.25	PASS
11B	Ant2	High	2462	1.98	-48.31	≤ -28.02	PASS
11G	Ant1	Low	2412	-2.27	-40.32	≤ -32.27	PASS
11G	Ant2	Low	2412	0.42	-36.68	≤ -29.58	PASS
11G	Ant1	High	2462	-2.90	-47.93	≤ -32.9	PASS
11G	Ant2	High	2462	0.41	-48.52	≤ -29.59	PASS
11N20MIMO	Ant1	Low	2412	-3.88	-41.4	≤ -33.88	PASS
11N20MIMO	Ant2	Low	2412	-1.21	-38.17	≤ -31.21	PASS
11N20MIMO	Ant1	High	2462	-4.31	-48.51	≤ -34.31	PASS
11N20MIMO	Ant2	High	2462	-1.41	-48.52	≤ -31.41	PASS
11N40MIMO	Ant1	Low	2422	-8.81	-46.75	≤ -38.81	PASS
11N40MIMO	Ant2	Low	2422	-6.19	-45.49	≤ -36.19	PASS
11N40MIMO	Ant1	High	2452	-10.02	-48.87	≤ -40.02	PASS
11N40MIMO	Ant2	High	2452	-6.95	-48.19	≤ -36.95	PASS

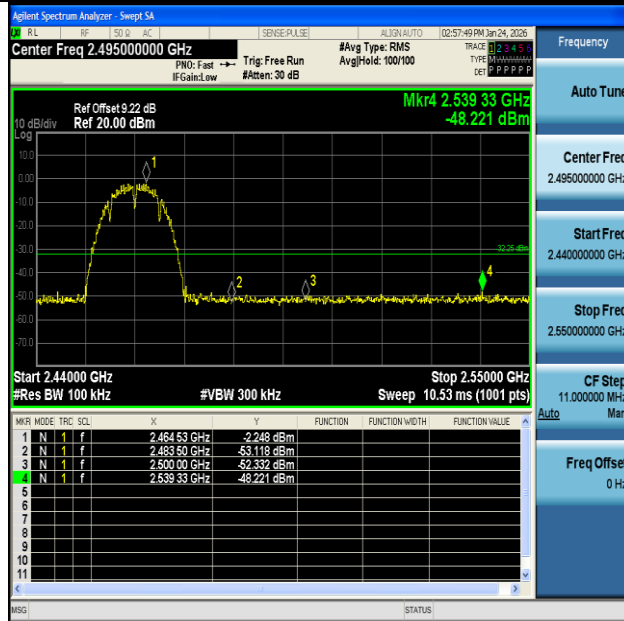
Note: offset(dB) = cable loss(dB) + attenuator factor(dB)



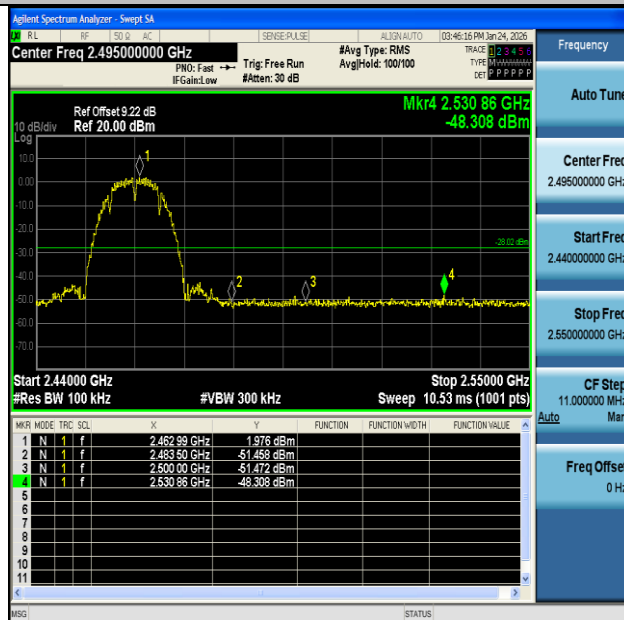


Test Graphs



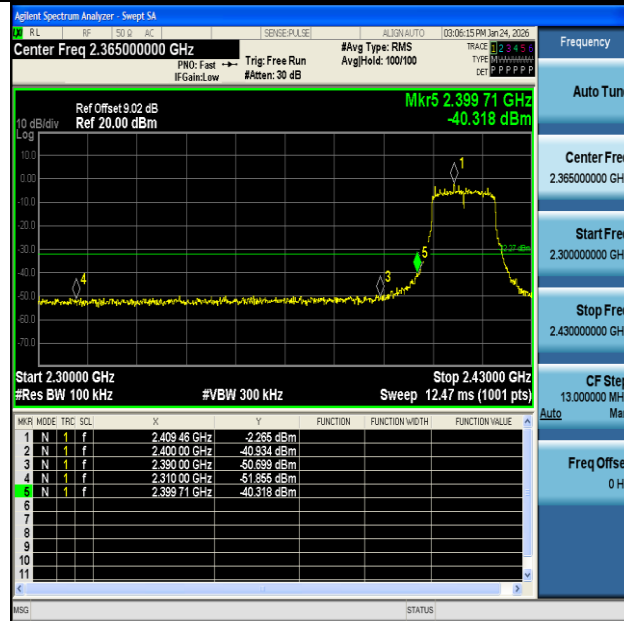


11B-Ant1-2462-PASS

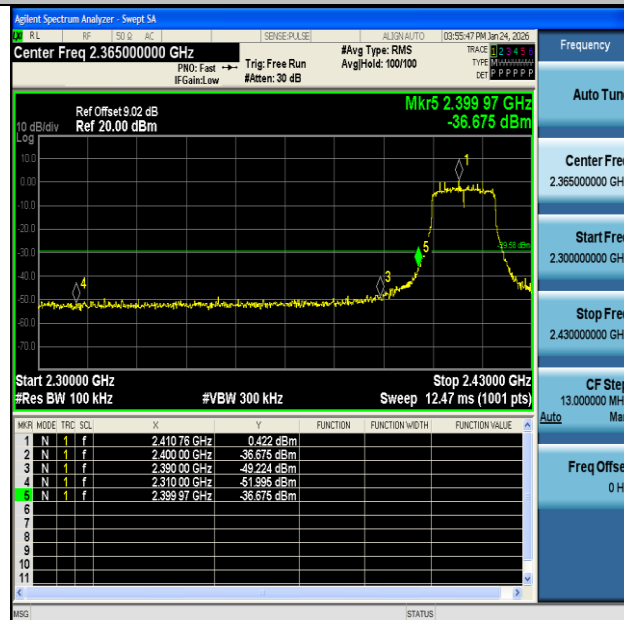


11B-Ant2-2462-PASS



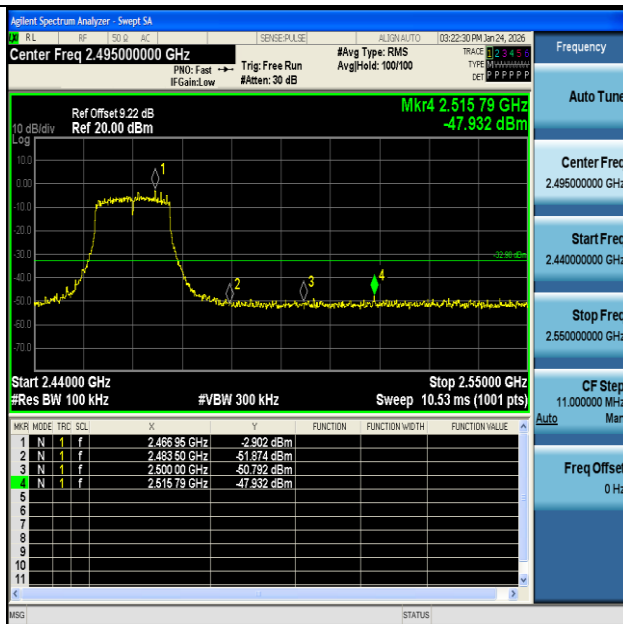


11G-Ant1-2412-PASS

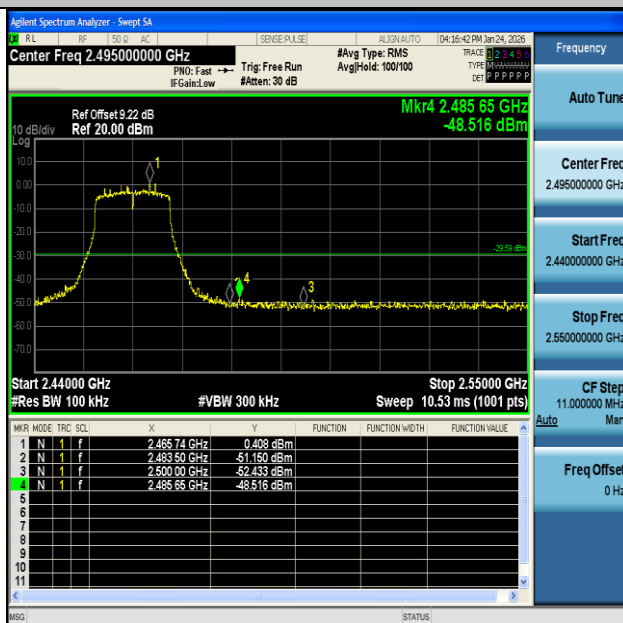


11G-Ant2-2412-PASS



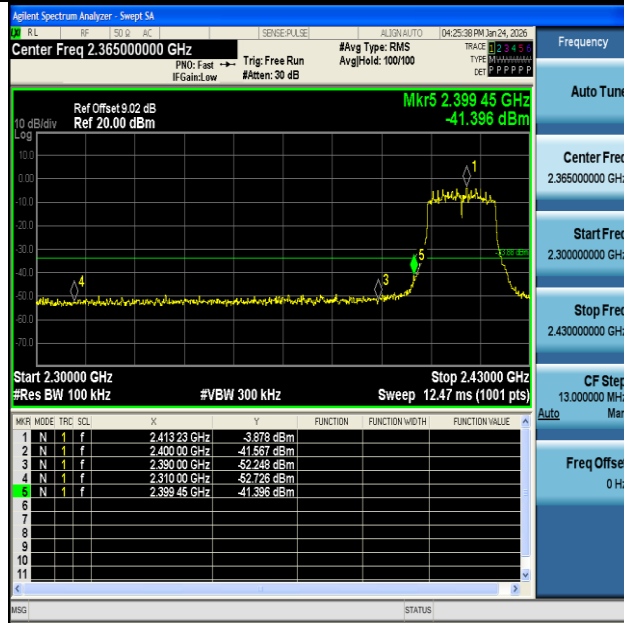


11G-Ant1-2462-PASS

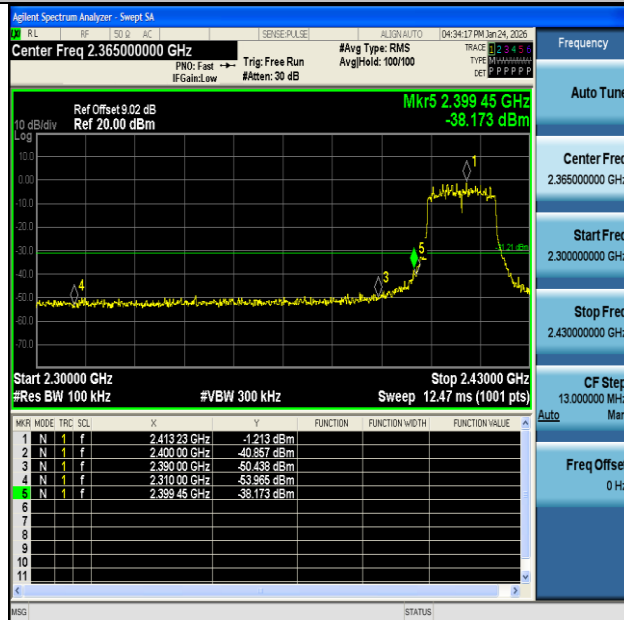


11G-Ant2-2462-PASS



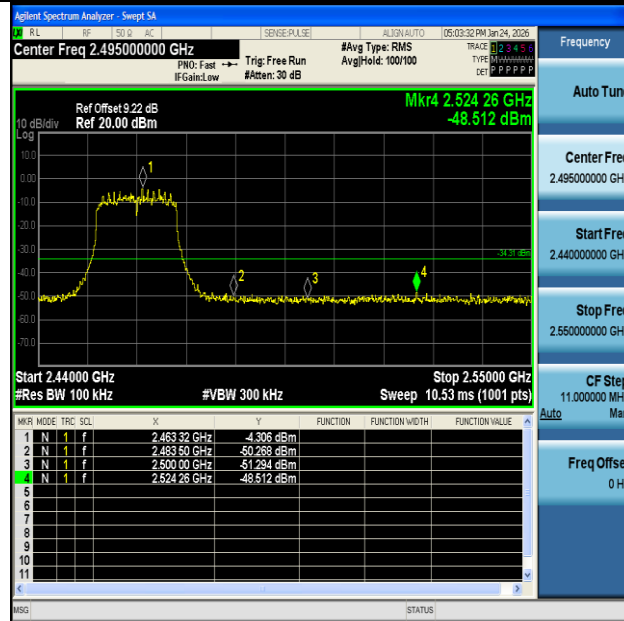


11N20MIMO-Ant1-2412-PASS

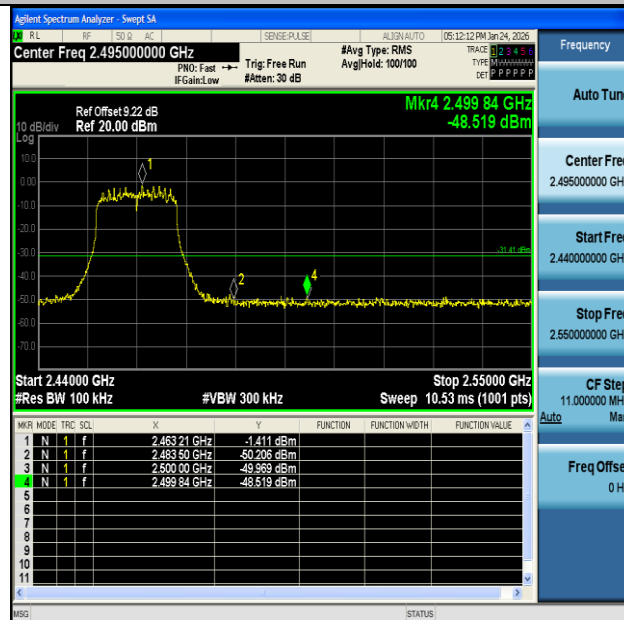


11N20MIMO-Ant2-2412-PASS



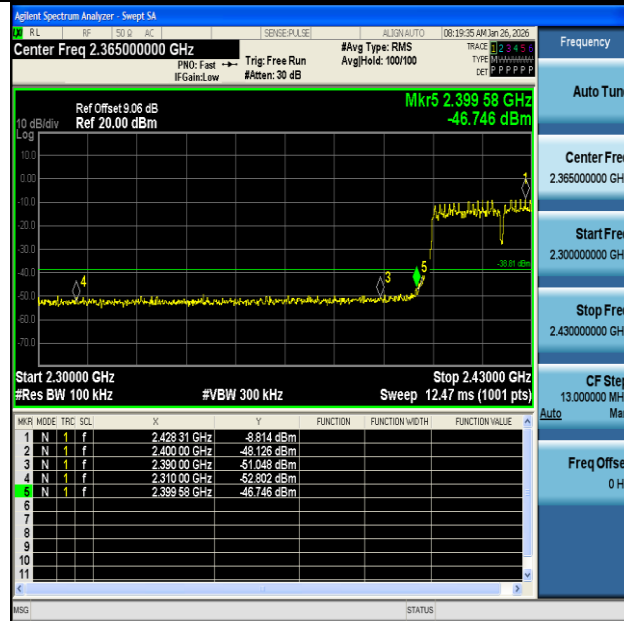


11N20MIMO-Ant1-2462-PASS

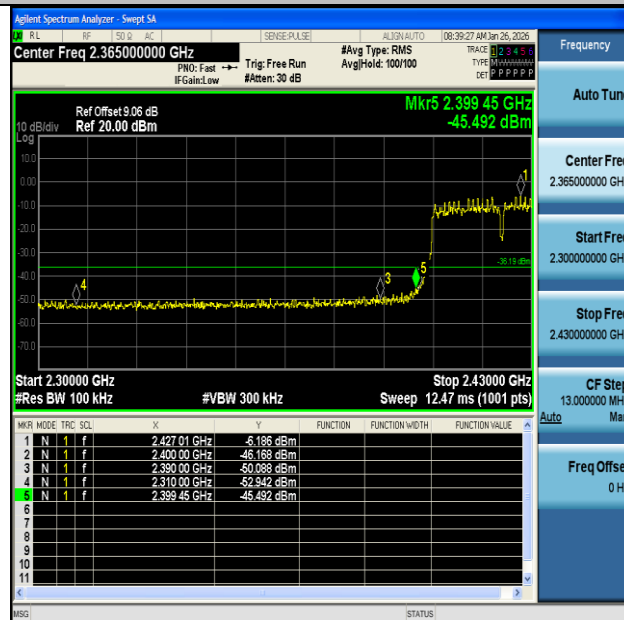


11N20MIMO-Ant2-2462-PASS



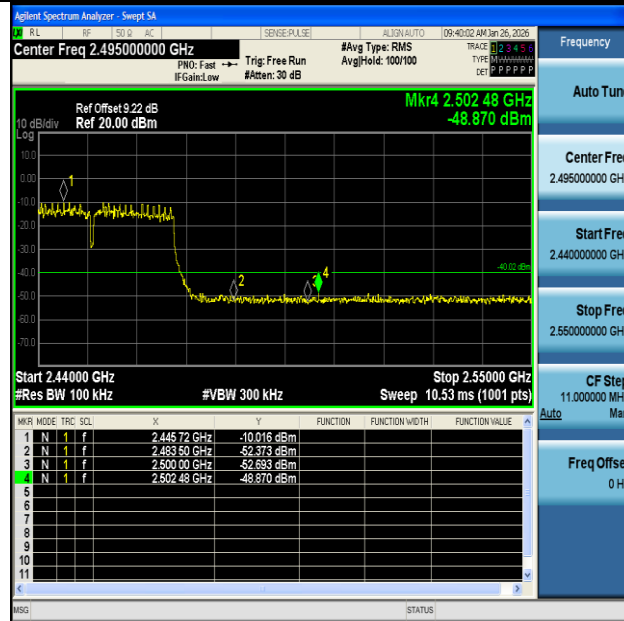


11N40MIMO-Ant1-2422-PASS

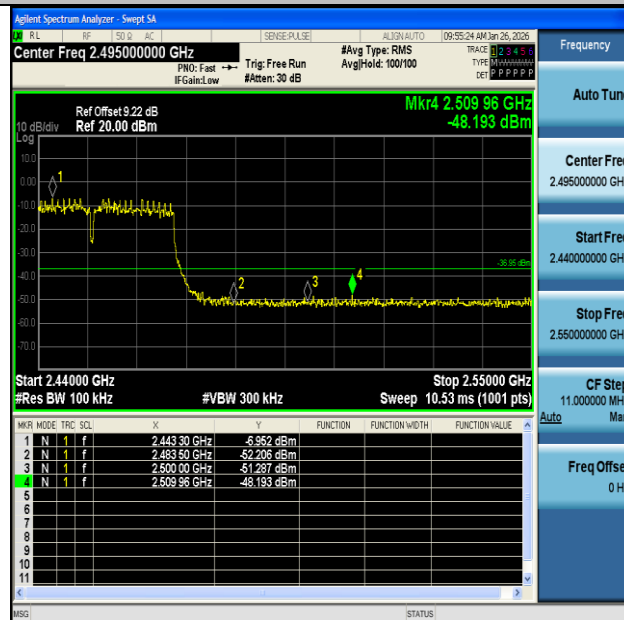


11N40MIMO-Ant2-2422-PASS





11N40MIMO-Ant1-2452-PASS



11N40MIMO-Ant2-2452-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	-2.14	-2.14	---	PASS
11B	Ant2	2412	0~Reference	1.59	1.59	---	PASS
11B	Ant1	2412	30~1000	-2.14	-61.73	≤-32.14	PASS
11B	Ant2	2412	30~1000	1.59	-62.93	≤-28.41	PASS
11B	Ant1	2412	1000~26500	-2.14	-37.42	≤-32.14	PASS
11B	Ant2	2412	1000~26500	1.59	-37.93	≤-28.41	PASS
11B	Ant1	2437	0~Reference	-0.37	-0.37	---	PASS
11B	Ant2	2437	0~Reference	2.22	2.22	---	PASS
11B	Ant1	2437	30~1000	-0.37	-61.73	≤-30.37	PASS
11B	Ant2	2437	30~1000	2.22	-62.6	≤-27.78	PASS
11B	Ant1	2437	1000~26500	-0.37	-36.74	≤-30.37	PASS
11B	Ant2	2437	1000~26500	2.22	-37.33	≤-27.78	PASS
11B	Ant1	2462	0~Reference	-2.75	-2.75	---	PASS
11B	Ant2	2462	0~Reference	1.71	1.71	---	PASS
11B	Ant1	2462	30~1000	-2.75	-62.3	≤-32.75	PASS
11B	Ant2	2462	30~1000	1.71	-63.08	≤-28.29	PASS
11B	Ant1	2462	1000~26500	-2.75	-37.54	≤-32.75	PASS
11B	Ant2	2462	1000~26500	1.71	-37.85	≤-28.29	PASS
11G	Ant1	2412	0~Reference	-2.36	-2.36	---	PASS
11G	Ant2	2412	0~Reference	-2.42	-2.42	---	PASS
11G	Ant1	2412	30~1000	-2.36	-63.08	≤-32.36	PASS
11G	Ant2	2412	30~1000	-2.42	-63.28	≤-32.42	PASS
11G	Ant1	2412	1000~26500	-2.36	-37.74	≤-32.36	PASS
11G	Ant2	2412	1000~26500	-2.42	-37.91	≤-32.42	PASS
11G	Ant1	2437	0~Reference	-1.79	-1.79	---	PASS
11G	Ant2	2437	0~Reference	-2.17	-2.17	---	PASS
11G	Ant1	2437	30~1000	-1.79	-63.04	≤-31.79	PASS
11G	Ant2	2437	30~1000	-2.17	-62.42	≤-32.17	PASS
11G	Ant1	2437	1000~26500	-1.79	-37.61	≤-31.79	PASS
11G	Ant2	2437	1000~26500	-2.17	-37.17	≤-32.17	PASS
11G	Ant1	2462	0~Reference	-5.41	-5.41	---	PASS
11G	Ant2	2462	0~Reference	-2.55	-2.55	---	PASS
11G	Ant1	2462	30~1000	-5.41	-61.81	≤-35.41	PASS
11G	Ant2	2462	30~1000	-2.55	-61.84	≤-32.55	PASS
11G	Ant1	2462	1000~26500	-5.41	-36.78	≤-35.41	PASS
11G	Ant2	2462	1000~26500	-2.55	-37.62	≤-32.55	PASS
11N20MIMO	Ant1	2412	0~Reference	-4.31	-4.31	---	PASS

