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

Product Name: Set Top Box

Trade Mark: ROBERTS COMMUNICATIONS NETWORK

Test Model: ROBERTS-3PATH

FCC ID: 2BK67-ROBERTS-3PATH

Environmental Conditions

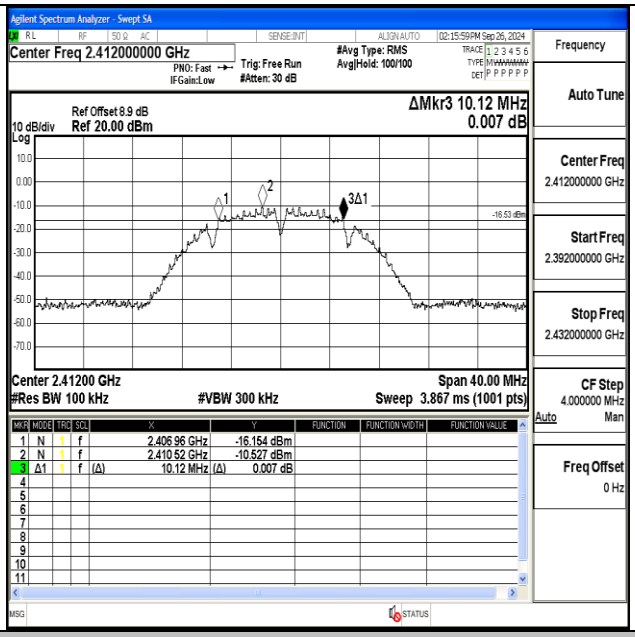
Temperature:	23.8℃
Relative Humidity:	58%
ATM Pressure:	100.0 kPa
Test Engineer:	Allen Lai
Supervised by:	Hugo Chen
NOTE	N/A

Appendix A: DTS Bandwidth

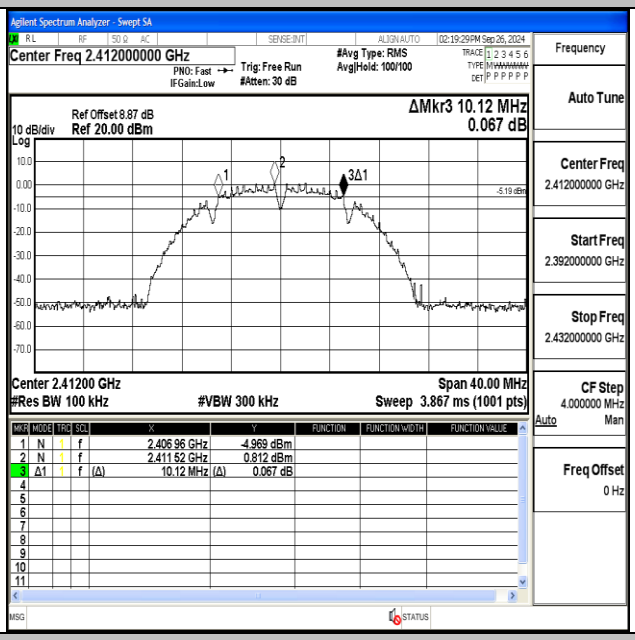
Test Result

Test Mode	Antenna	Frequency [MHz]	DTS BW [MHz]	FL [MHz]	FH [MHz]	Limit [MHz]	Verdict
11B	Ant1	2412	10.120	2406.960	2417.080	0.5	PASS
11B	Ant2	2412	10.120	2406.960	2417.080	0.5	PASS
11B	Ant2	2437	10.040	2432.000	2442.040	0.5	PASS
11B	Ant1	2437	9.880	2432.200	2442.080	0.5	PASS
11B	Ant2	2462	9.920	2457.040	2466.960	0.5	PASS
11B	Ant1	2462	10.080	2456.960	2467.040	0.5	PASS
11G	Ant2	2412	15.680	2404.120	2419.800	0.5	PASS
11G	Ant1	2412	16.040	2404.120	2420.160	0.5	PASS
11G	Ant2	2437	16.280	2428.880	2445.160	0.5	PASS
11G	Ant1	2437	15.440	2429.480	2444.920	0.5	PASS
11G	Ant2	2462	16.040	2453.880	2469.920	0.5	PASS
11G	Ant1	2462	15.440	2454.480	2469.920	0.5	PASS
11N20MIMO	Ant2	2412	16.920	2403.240	2420.160	0.5	PASS
11N20MIMO	Ant1	2412	16.200	2404.120	2420.320	0.5	PASS
11N20MIMO	Ant2	2437	16.280	2428.880	2445.160	0.5	PASS
11N20MIMO	Ant1	2437	16.400	2429.120	2445.520	0.5	PASS
11N20MIMO	Ant2	2462	16.040	2453.880	2469.920	0.5	PASS
11N20MIMO	Ant1	2462	15.880	2454.280	2470.160	0.5	PASS
11N40MIMO	Ant2	2422	34.960	2404.560	2439.520	0.5	PASS
11N40MIMO	Ant1	2422	35.040	2404.480	2439.520	0.5	PASS
11N40MIMO	Ant2	2437	35.040	2419.480	2454.520	0.5	PASS
11N40MIMO	Ant1	2437	32.560	2421.960	2454.520	0.5	PASS
11N40MIMO	Ant1	2452	35.040	2434.480	2469.520	0.5	PASS
11N40MIMO	Ant2	2452	33.840	2434.480	2468.320	0.5	PASS

Test Graphs



11B-Ant1-2412-PASS



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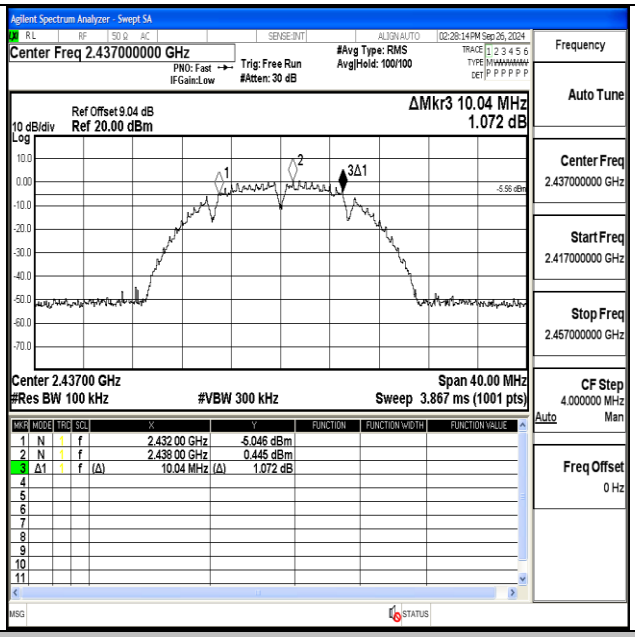

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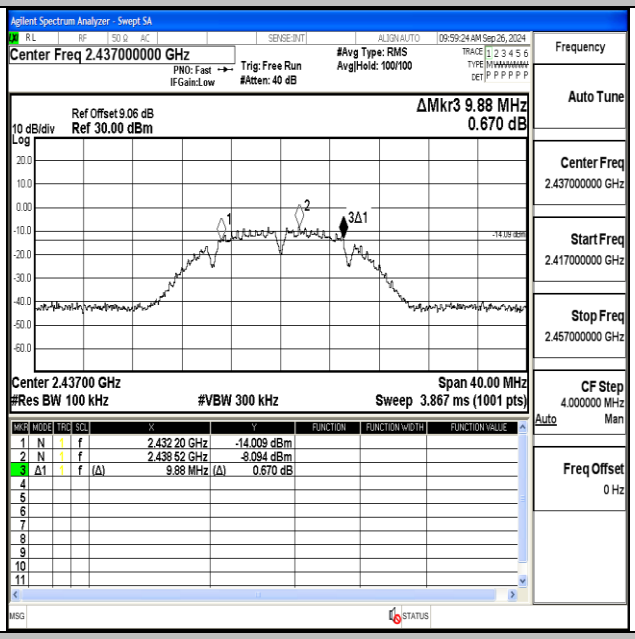

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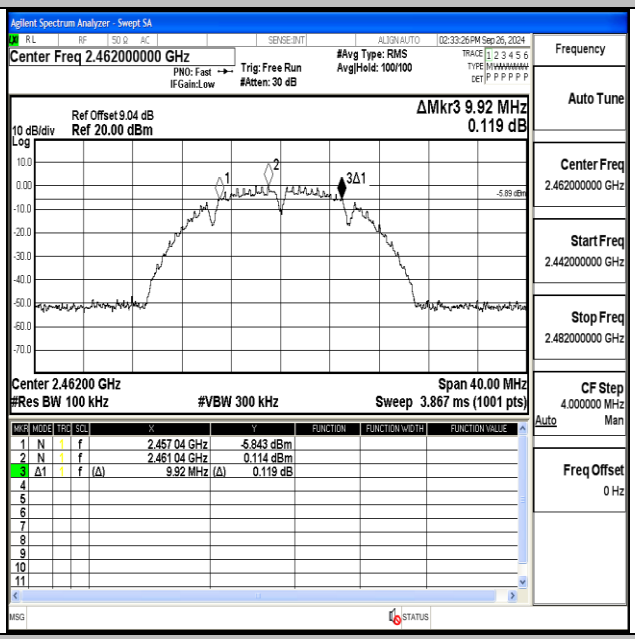

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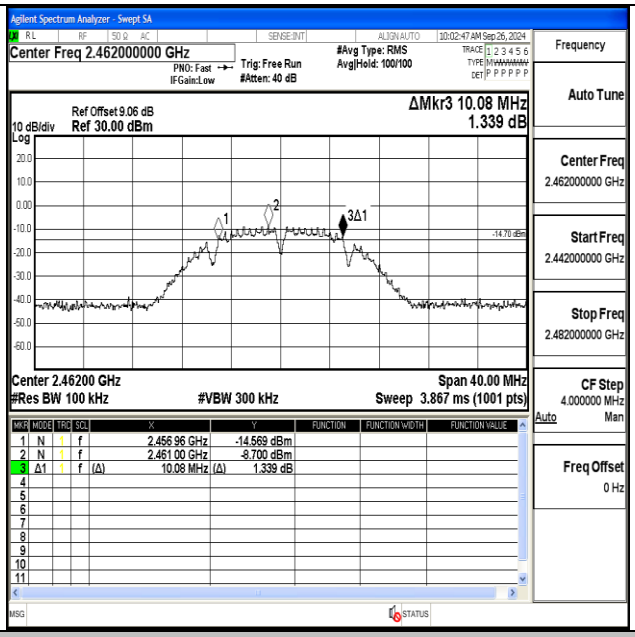

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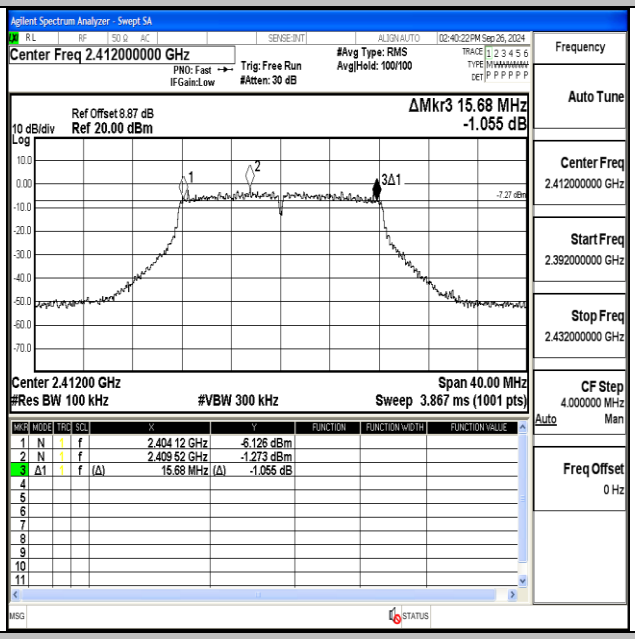

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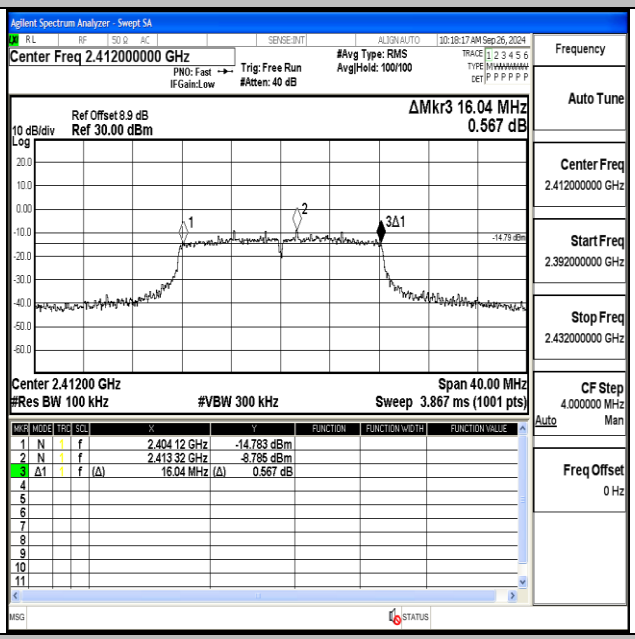

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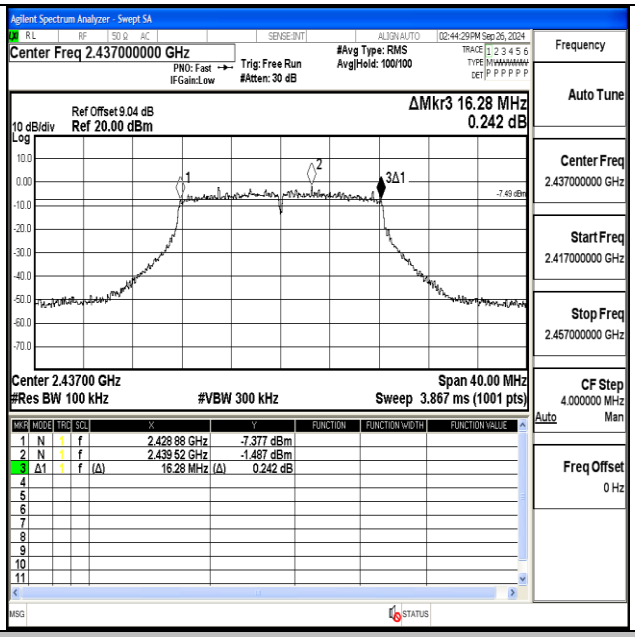

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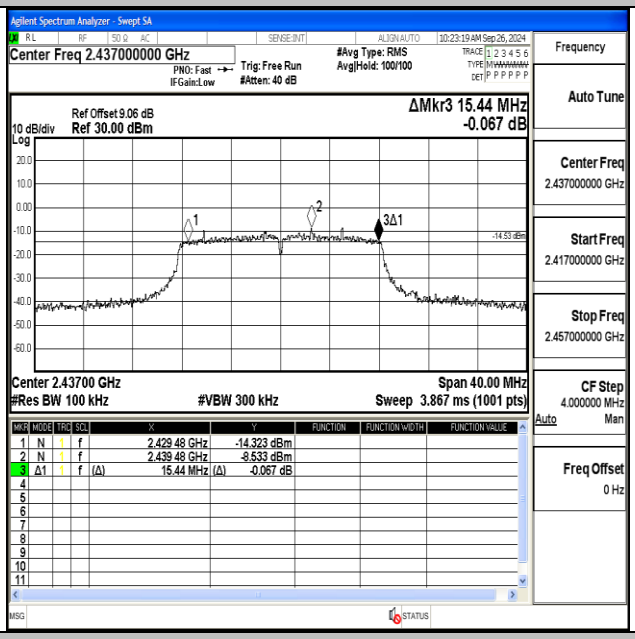

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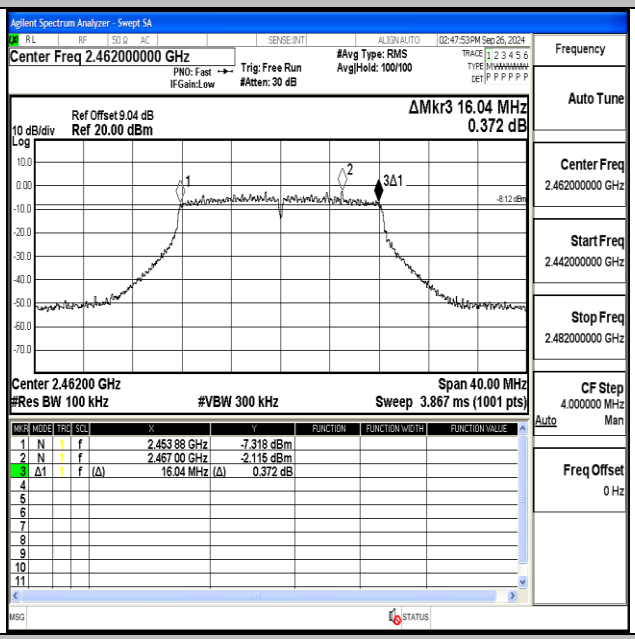

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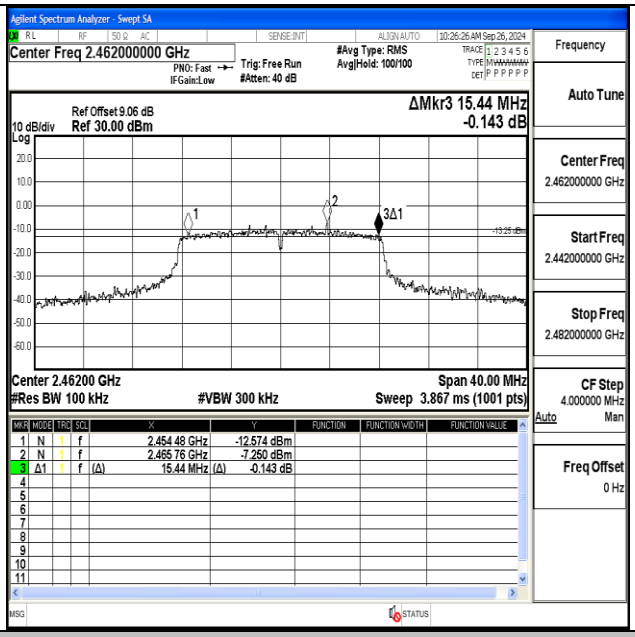

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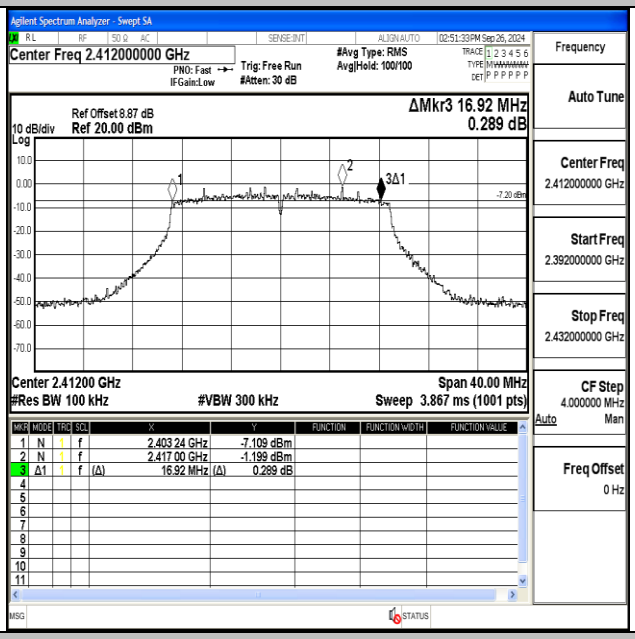

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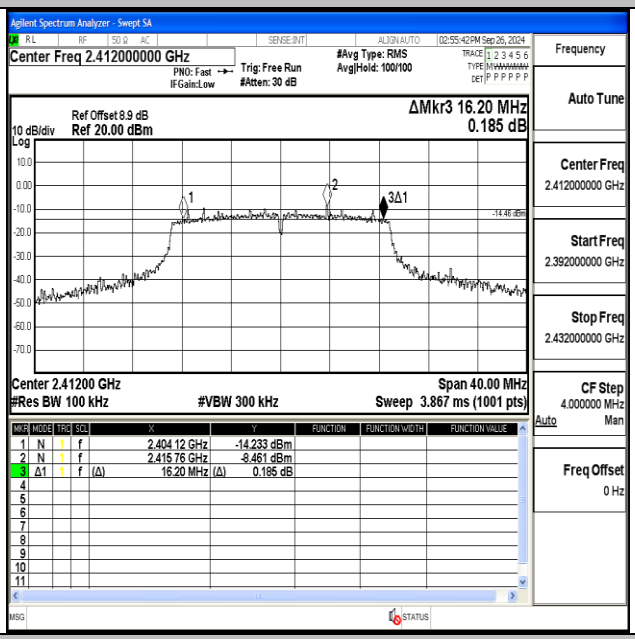

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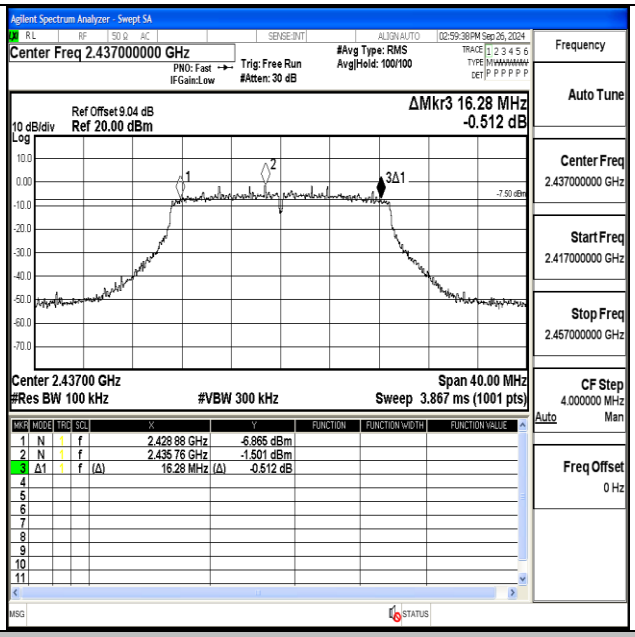

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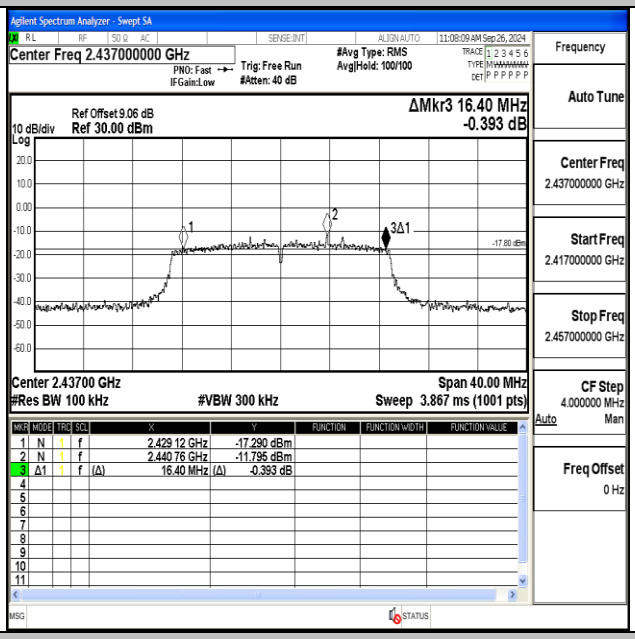

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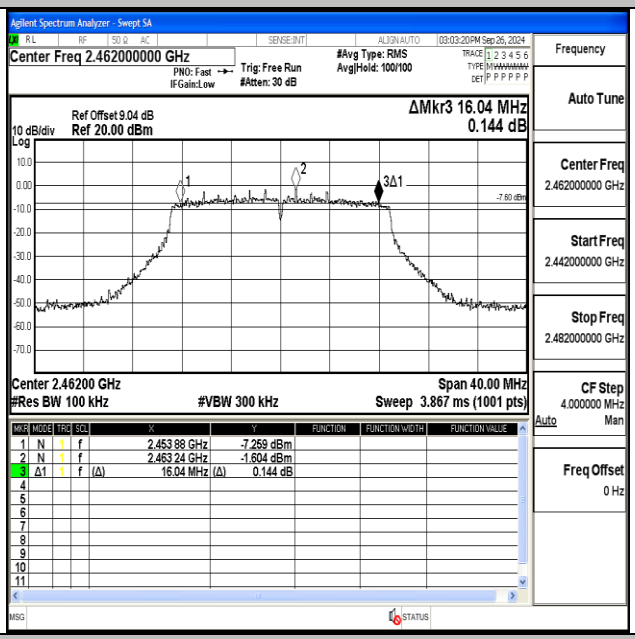

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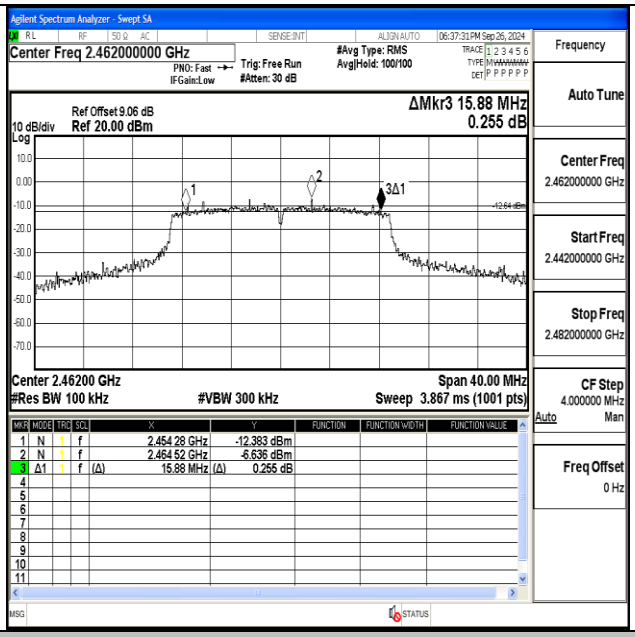

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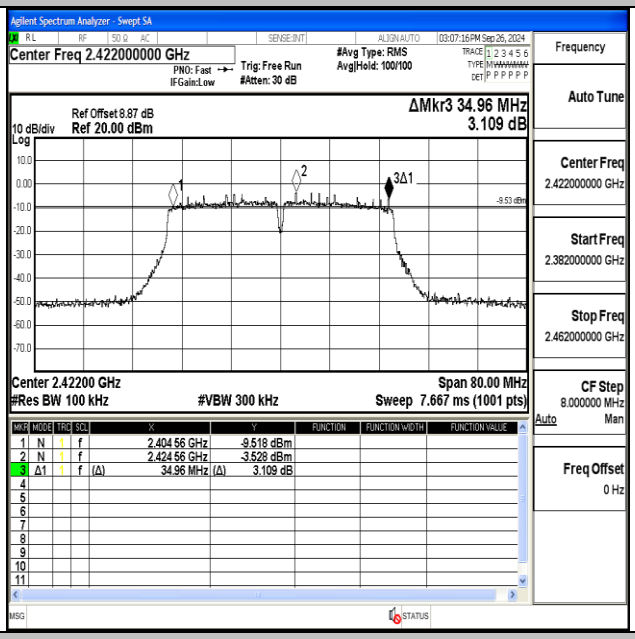
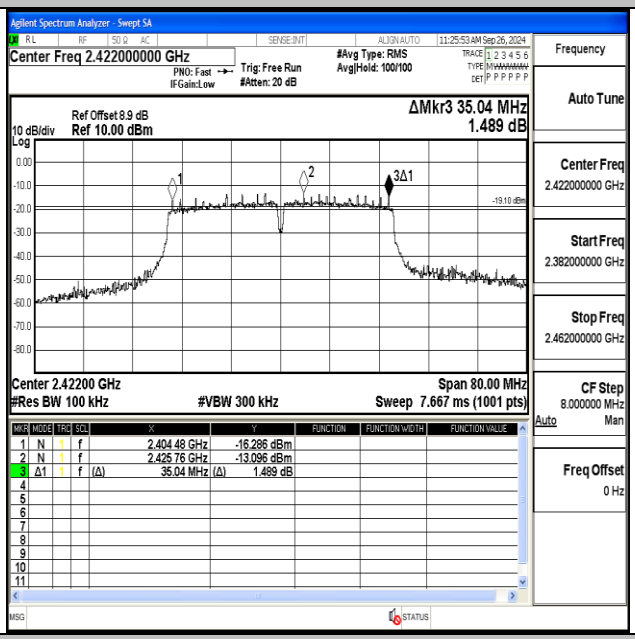


11N40MIMO-Ant2-2422-PASS



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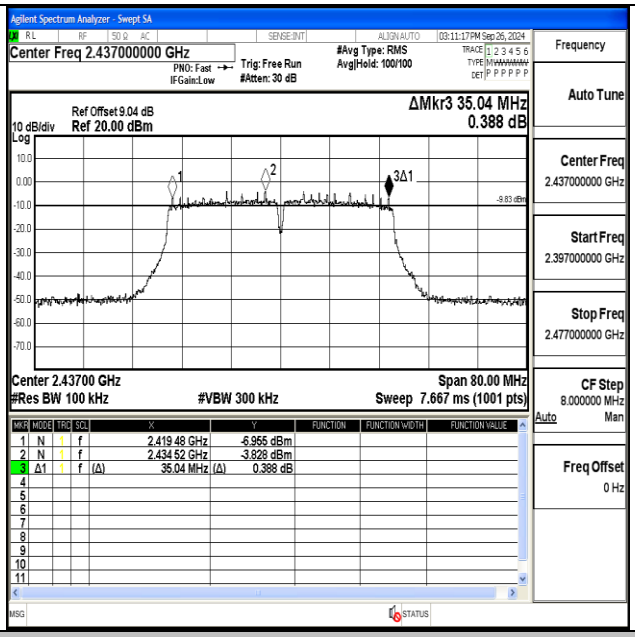

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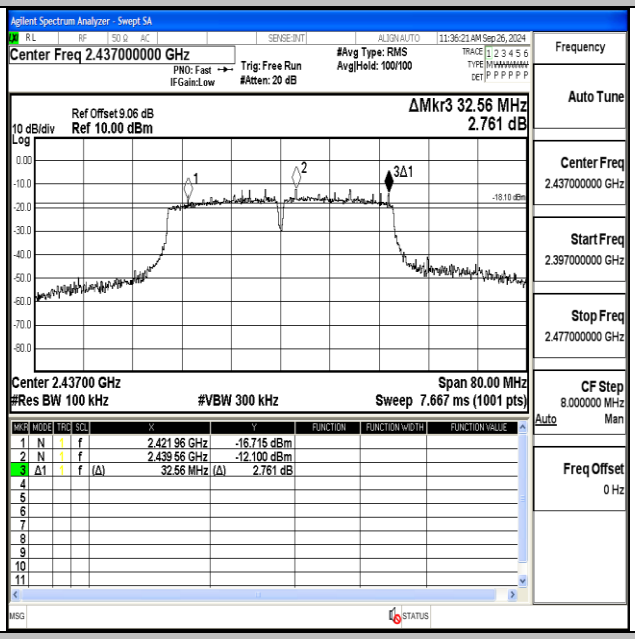

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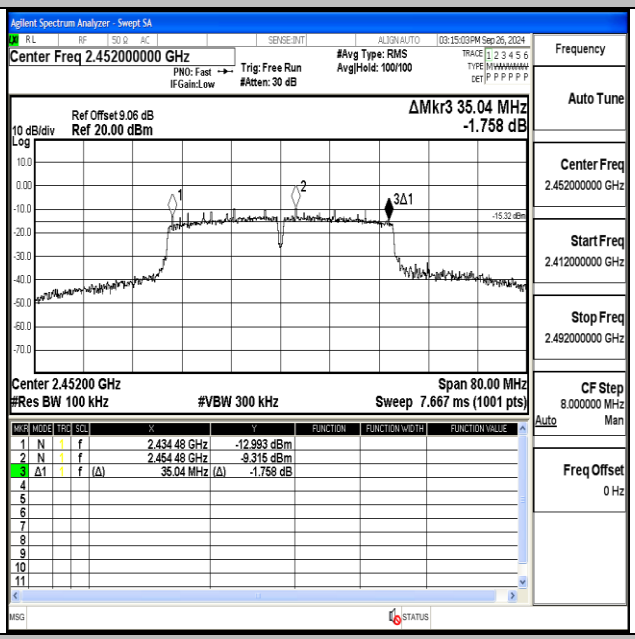
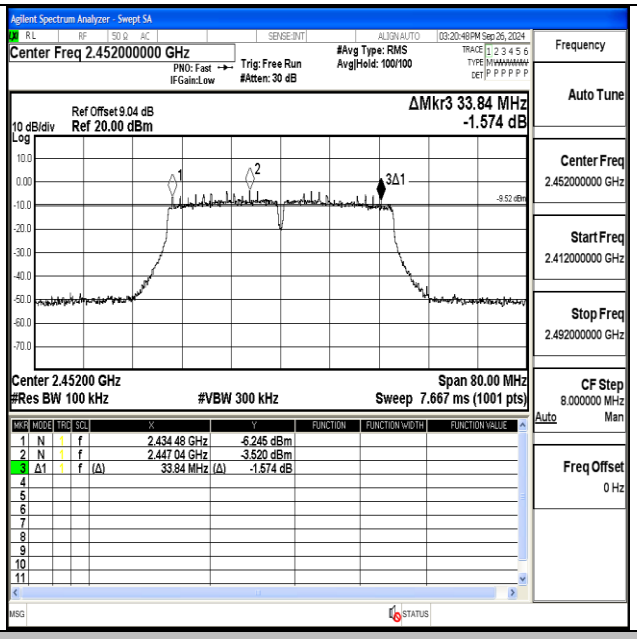


11N40MIMO-Ant1-2452-PASS



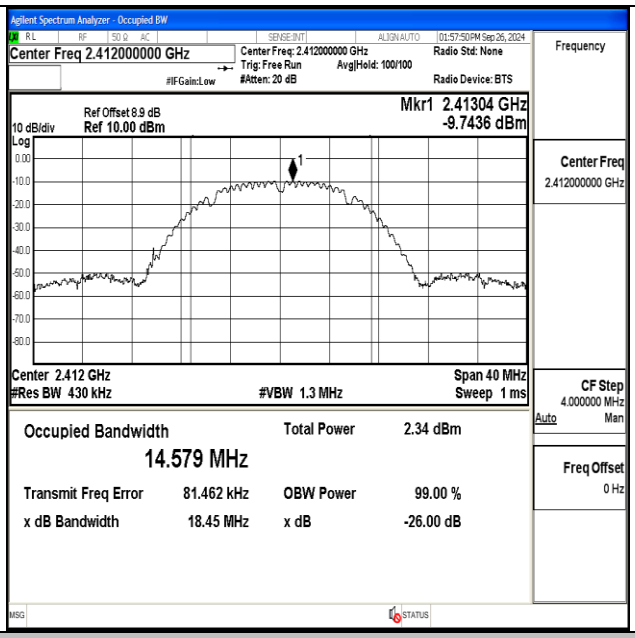
11N40MIMO-Ant2-2452-PASS

Appendix B: Occupied Channel Bandwidth

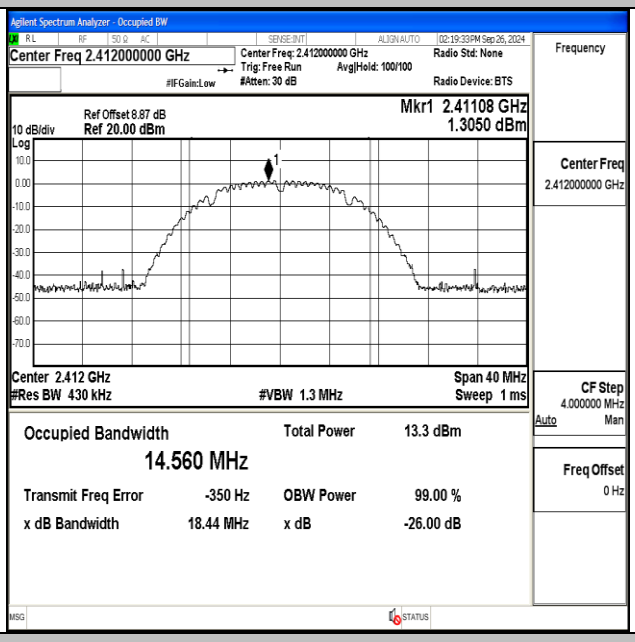
Test Result

Test Mode	Antenna	Channel Frequency [MHz]	OCB [MHz]	FL [MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	14.579	2404.7920	2419.3710	---	---
11B	Ant2	2412	14.560	2404.7197	2419.2797	---	---
11B	Ant1	2437	15.646	2429.2833	2444.9293	---	---
11B	Ant2	2437	14.593	2429.7390	2444.3320	---	---
11B	Ant1	2462	15.792	2454.1521	2469.9441	---	---
11B	Ant2	2462	14.595	2454.7095	2469.3045	---	---
11G	Ant1	2412	17.043	2403.5713	2420.6143	---	---
11G	Ant2	2412	16.605	2403.7616	2420.3666	---	---
11G	Ant1	2437	17.079	2428.5448	2445.6238	---	---
11G	Ant2	2437	16.627	2428.7301	2445.3571	---	---
11G	Ant1	2462	17.100	2453.5333	2470.6333	---	---
11G	Ant2	2462	16.628	2453.7280	2470.3560	---	---
11N20MIMO	Ant2	2412	17.950	2403.0798	2421.0298	---	---
11N20MIMO	Ant1	2412	18.072	2403.0914	2421.1634	---	---
11N20MIMO	Ant1	2437	18.164	2428.0105	2446.1745	---	---
11N20MIMO	Ant2	2437	17.834	2428.1385	2445.9725	---	---
11N20MIMO	Ant1	2462	18.225	2453.0113	2471.2363	---	---
11N20MIMO	Ant2	2462	17.805	2453.1206	2470.9256	---	---
11N40MIMO	Ant1	2422	36.308	2404.0615	2440.3695	---	---
11N40MIMO	Ant2	2422	36.276	2403.9519	2440.2279	---	---
11N40MIMO	Ant1	2437	36.261	2419.0803	2455.3413	---	---
11N40MIMO	Ant2	2437	36.149	2419.0244	2455.1734	---	---
11N40MIMO	Ant2	2452	36.141	2433.9461	2470.0871	---	---
11N40MIMO	Ant1	2452	36.645	2433.9663	2470.6113	---	---

Test Graphs



11B-Ant1-2412



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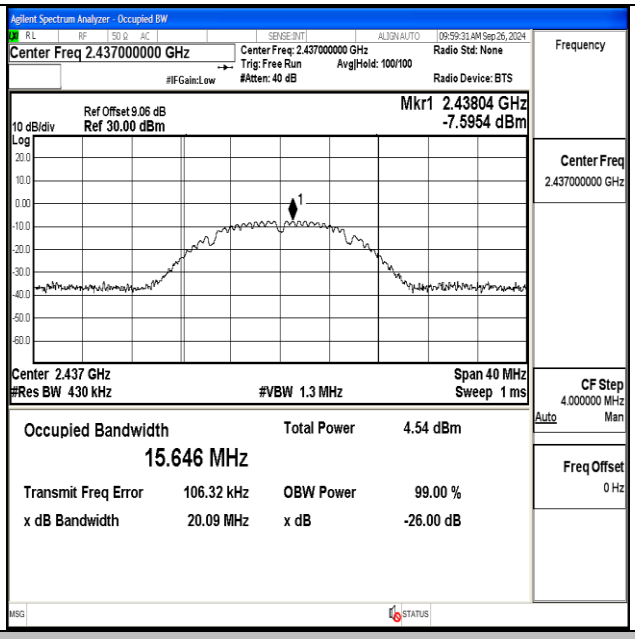
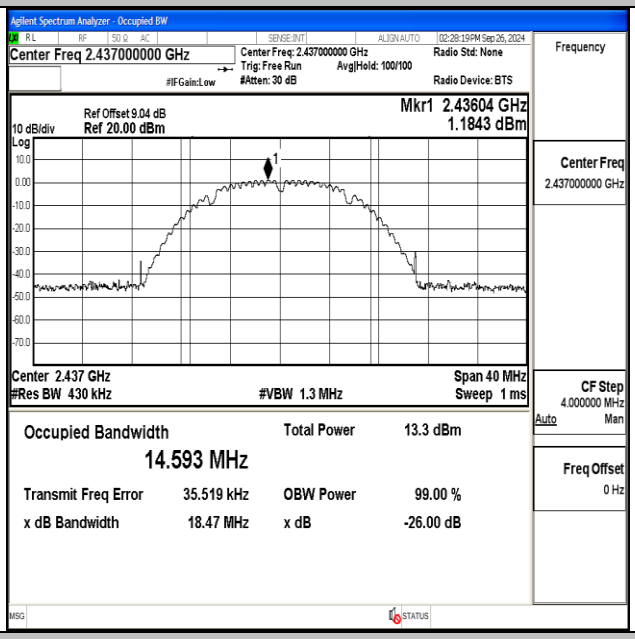


11B-Ant1-2437



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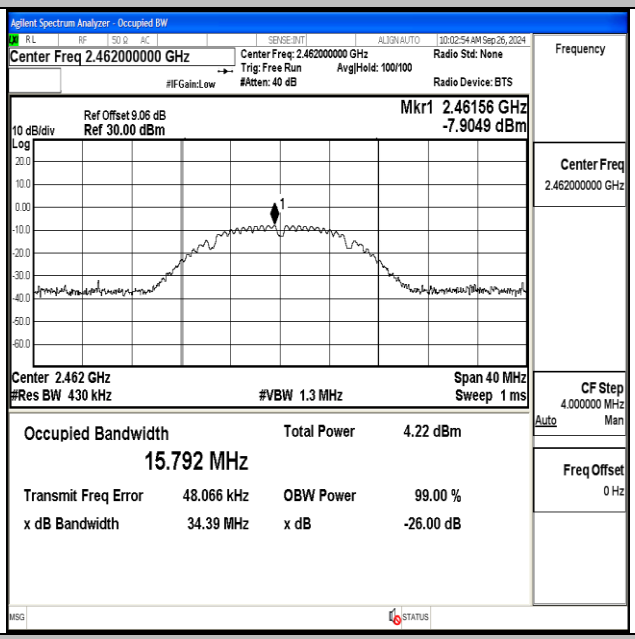

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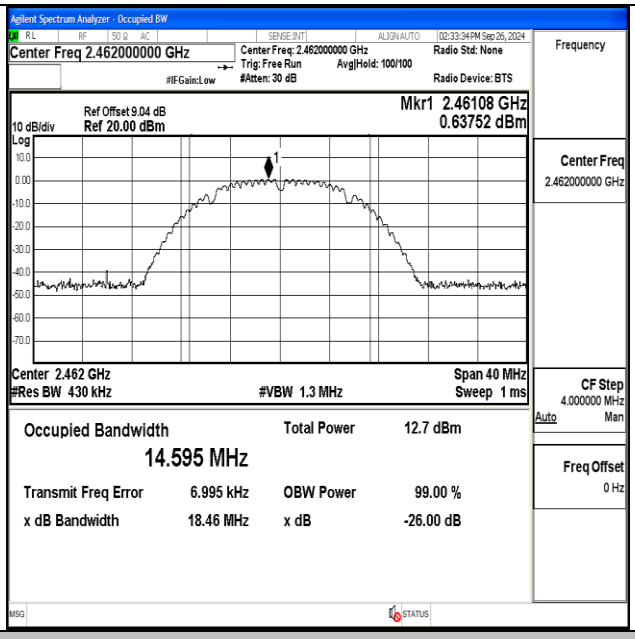

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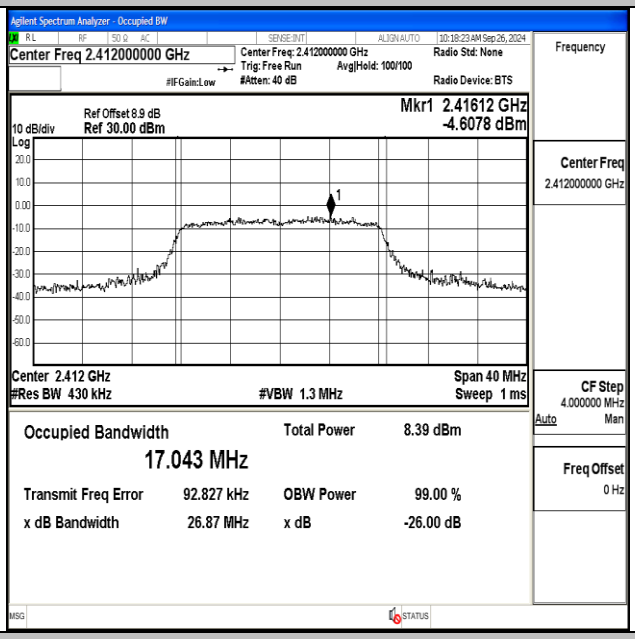

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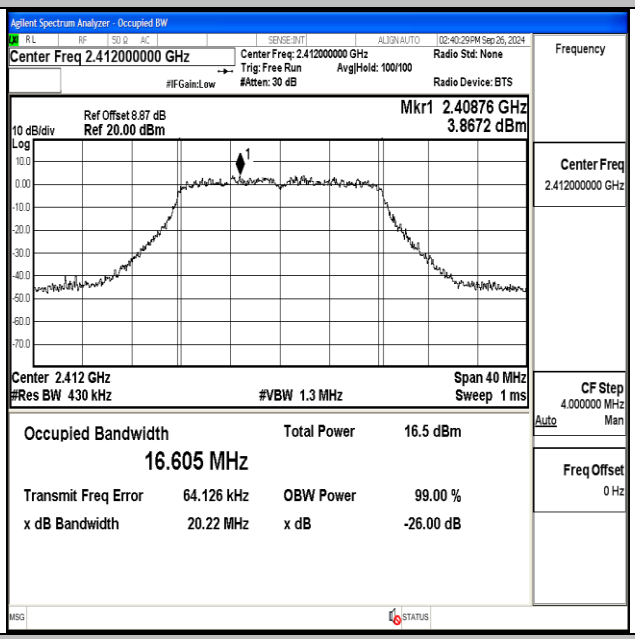

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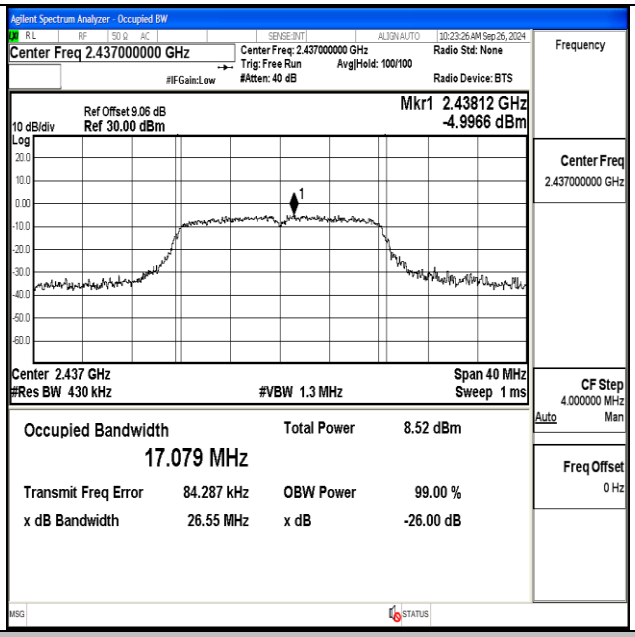

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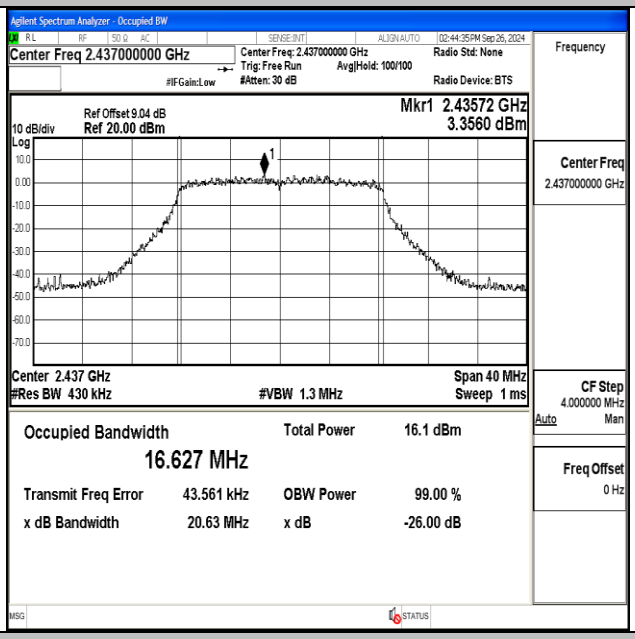

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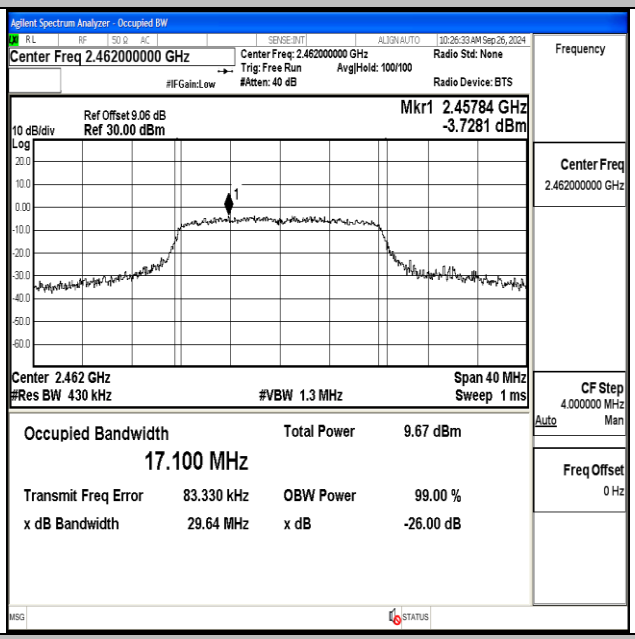
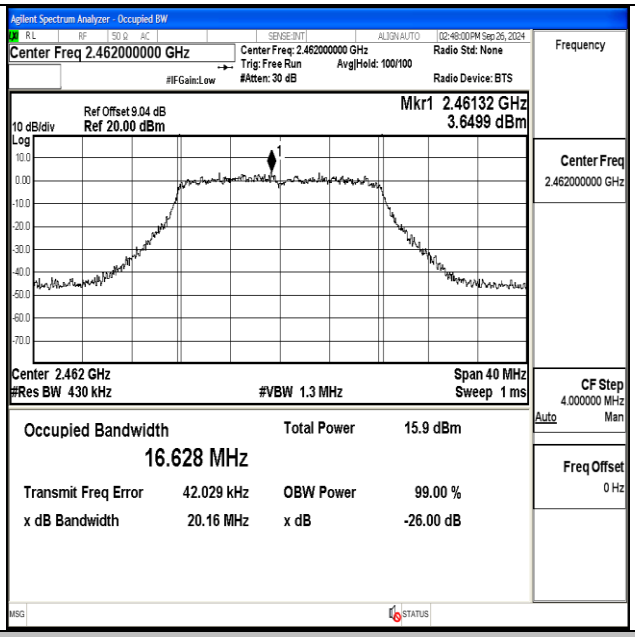


11G-Ant1-2462



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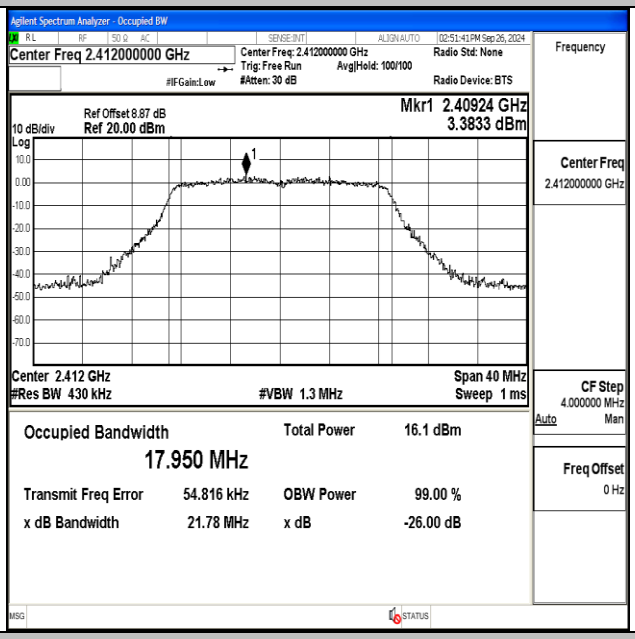

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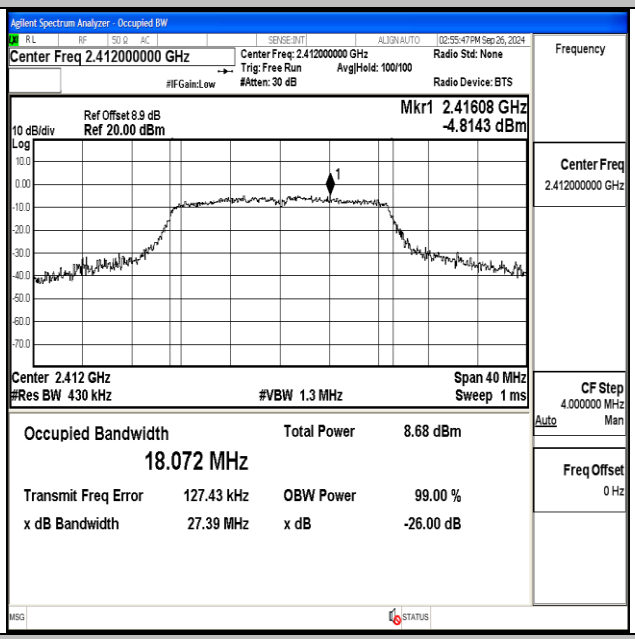

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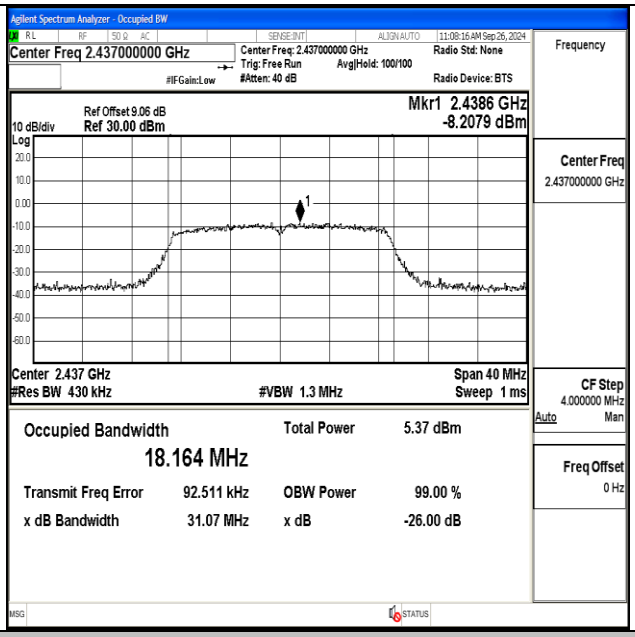

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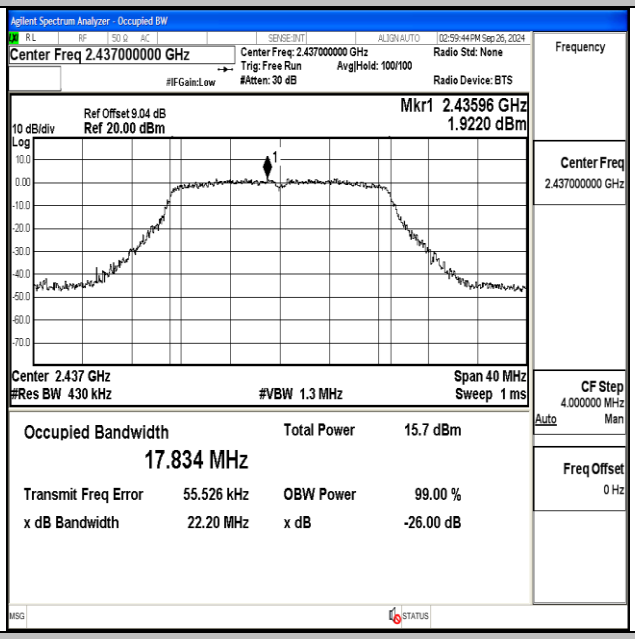

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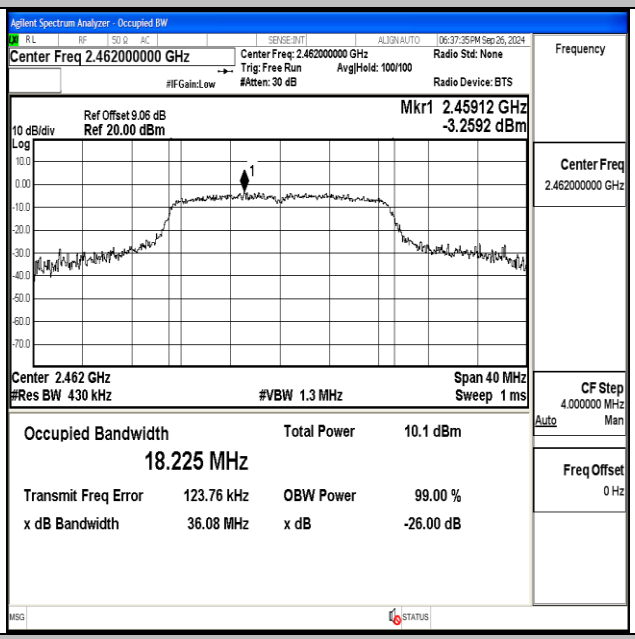

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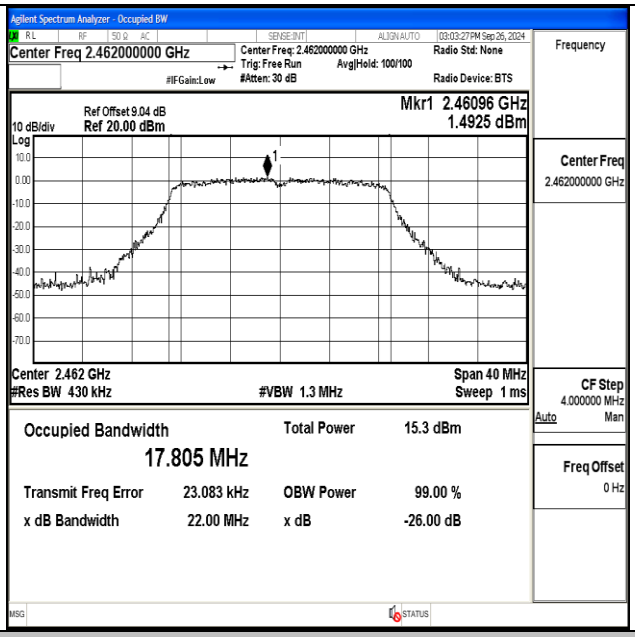
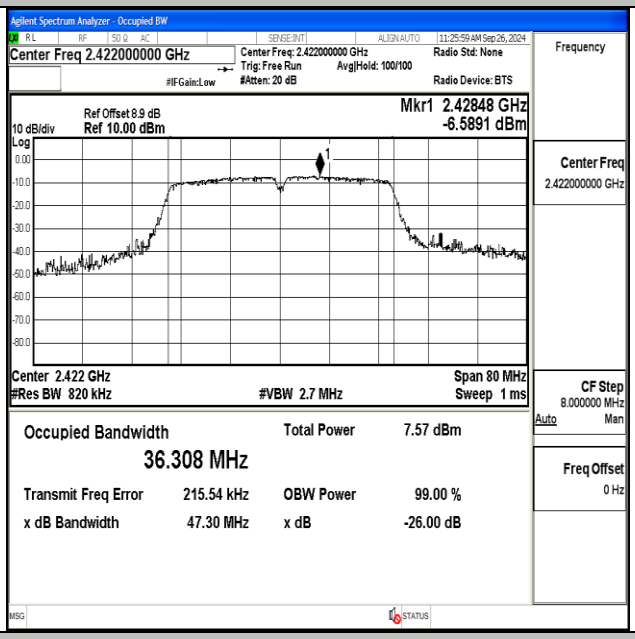
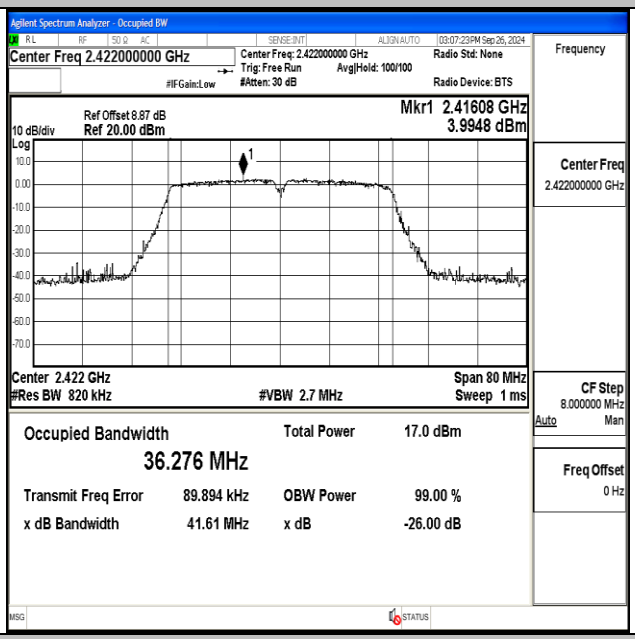


11N20MIMO-Ant2-2462



11N40MIMO-Ant1-2422



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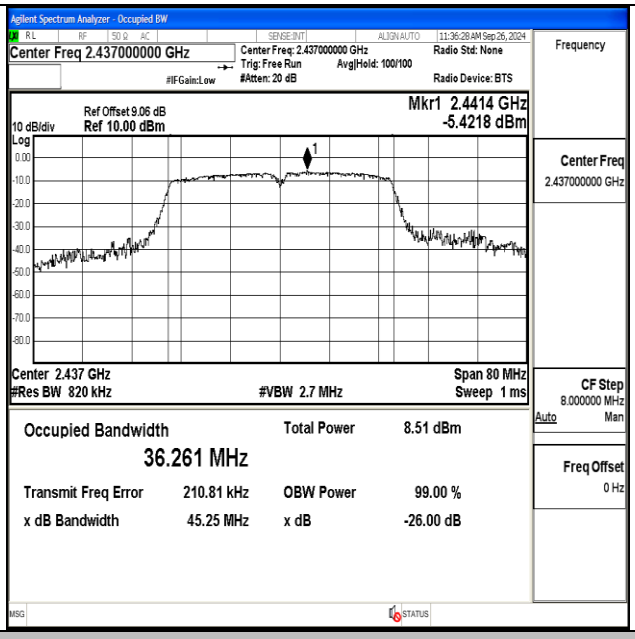
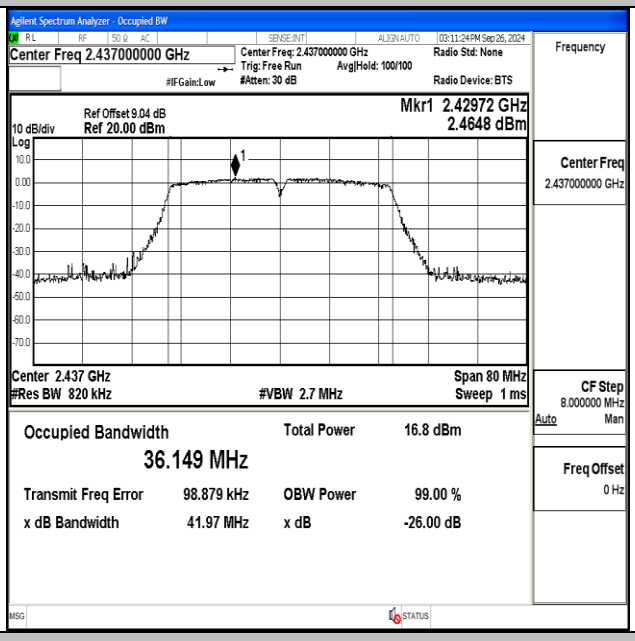
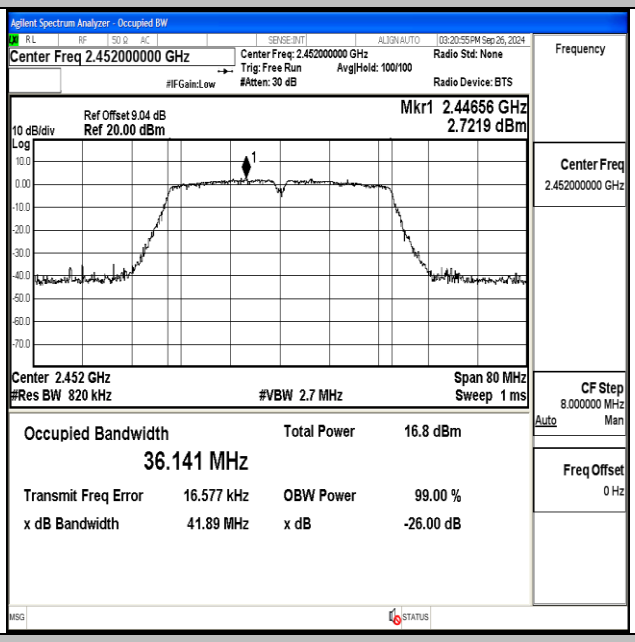


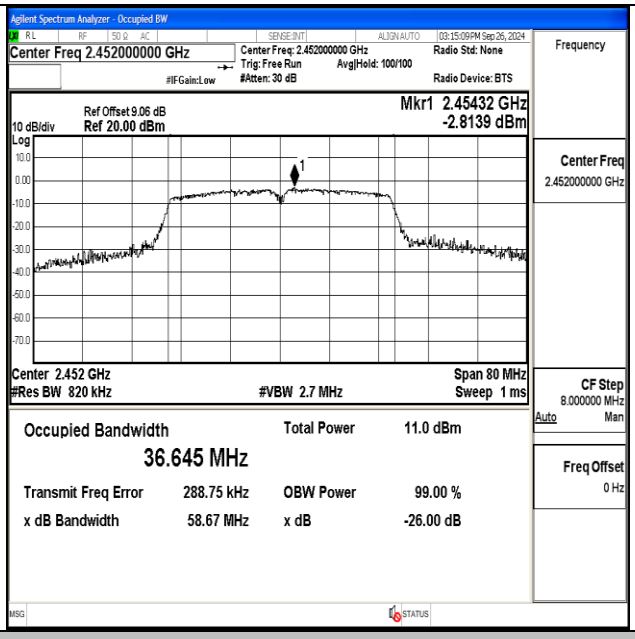
11N40MIMO-Ant1-2437



11N40MIMO-Ant2-2437



11N40MIMO-Ant2-2452



11N40MIMO-Ant1-2452

Appendix C: Maximum Average conducted output power

Test Result

Test Mode	Antenna	Frequency [MHz]	Conducted Power [dBm]	Conducted Limit [dBm]	Verdict
11B	Ant2	2412	10.25	≤30.00	PASS
11B	Ant1	2412	0.52	≤30.00	PASS
11B	Ant1	2437	1.53	≤30.00	PASS
11B	Ant2	2437	6.66	≤30.00	PASS
11B	Ant1	2462	1.66	≤30.00	PASS
11B	Ant2	2462	9.68	≤30.00	PASS
11G	Ant1	2412	2.36	≤30.00	PASS
11G	Ant2	2412	10.14	≤30.00	PASS
11G	Ant1	2437	2.61	≤30.00	PASS
11G	Ant2	2437	9.73	≤30.00	PASS
11G	Ant1	2462	3.76	≤30.00	PASS
11G	Ant2	2462	9.40	≤30.00	PASS
11N20MIMO	Ant1	2412	2.76	≤30.00	PASS
11N20MIMO	Ant2	2412	10.06	≤30.00	PASS
11N20MIMO	total	2412	10.80	≤30.00	PASS
11N20MIMO	Ant2	2437	9.80	≤30.00	PASS
11N20MIMO	total	2437	10.19	≤30.00	PASS
11N20MIMO	Ant1	2437	3.84	≤30.00	PASS
11N20MIMO	Ant2	2462	9.24	≤30.00	PASS
11N20MIMO	total	2462	9.62	≤30.00	PASS
11N20MIMO	Ant1	2462	4.23	≤30.00	PASS
11N40MIMO	Ant2	2422	10.28	≤30.00	PASS
11N40MIMO	total	2422	10.70	≤30.00	PASS
11N40MIMO	Ant1	2422	3.20	≤30.00	PASS
11N40MIMO	Ant2	2437	10.00	≤30.00	PASS
11N40MIMO	total	2437	10.43	≤30.00	PASS
11N40MIMO	Ant1	2437	3.90	≤30.00	PASS
11N40MIMO	Ant1	2452	4.20	≤30.00	PASS
11N40MIMO	Ant2	2452	9.82	≤30.00	PASS
11N40MIMO	total	2452	10.87	≤30.00	PASS

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

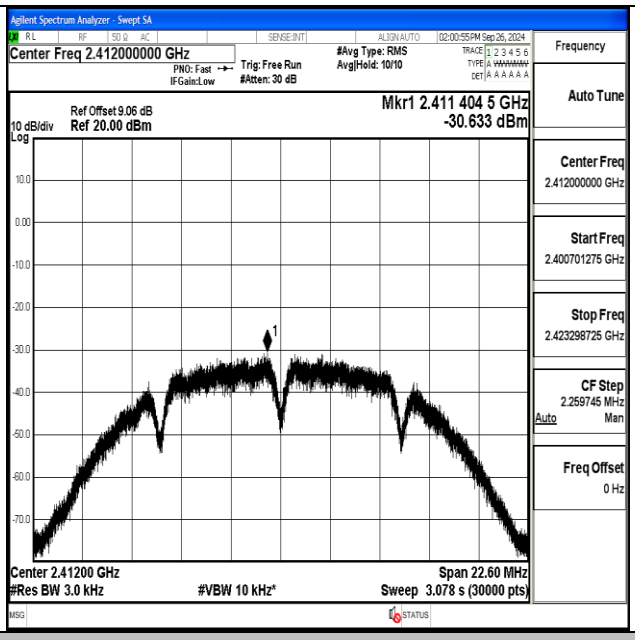
Appendix D: Maximum Average power spectral density

Test Result

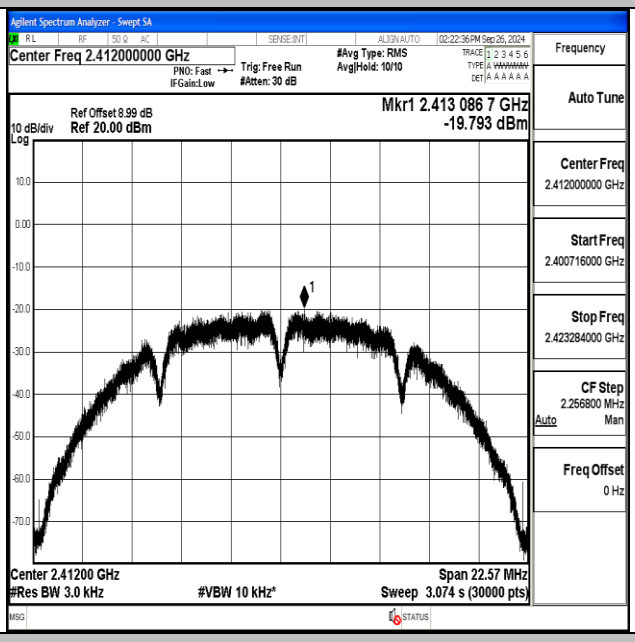
Test Mode	Antenna	Frequency [MHz]	Raw. Data [dBm/3-100kHz]	Dc. Factor	Result [dBm/3-100kHz]	Limit [dBm/3kHz]	Verdict
11B	Ant1	2412	-30.79	0.16	-30.63	≤8.00	PASS
11B	Ant2	2412	-19.91	0.12	-19.79	≤8.00	PASS
11B	Ant1	2437	-29.31	0.12	-29.19	≤8.00	PASS
11B	Ant2	2437	-20.64	0.00	-20.64	≤8.00	PASS
11B	Ant1	2462	-28.10	0.12	-27.98	≤8.00	PASS
11B	Ant2	2462	-21.88	0.15	-21.73	≤8.00	PASS
11G	Ant1	2412	-27.65	0.26	-27.39	≤8.00	PASS
11G	Ant2	2412	-19.03	0.36	-18.67	≤8.00	PASS
11G	Ant1	2437	-26.76	0.32	-26.44	≤8.00	PASS
11G	Ant2	2437	-20.22	0.32	-19.90	≤8.00	PASS
11G	Ant1	2462	-26.07	0.44	-25.63	≤8.00	PASS
11G	Ant2	2462	-20.83	0.27	-20.56	≤8.00	PASS
11N20MIMO	Ant2	2412	-18.45	0.31	-18.14	≤8.00	PASS
11N20MIMO	total	2412	---	---	-17.64	≤8.00	PASS
11N20MIMO	Ant1	2412	-27.95	0.49	-27.46	≤8.00	PASS
11N20MIMO	Ant1	2437	-30.98	0.45	-30.53	≤8.00	PASS
11N20MIMO	Ant2	2437	-20.76	0.43	-20.33	≤8.00	PASS
11N20MIMO	total	2437	---	---	-19.93	≤8.00	PASS
11N20MIMO	Ant2	2462	-20.78	0.28	-20.50	≤8.00	PASS
11N20MIMO	total	2462	---	---	-20.18	≤8.00	PASS
11N20MIMO	Ant1	2462	-26.29	0.47	-25.82	≤8.00	PASS
11N40MIMO	Ant1	2422	-32.11	0.43	-31.68	≤8.00	PASS
11N40MIMO	Ant2	2422	-23.09	0.94	-22.15	≤8.00	PASS
11N40MIMO	total	2422	---	---	-21.69	≤8.00	PASS
11N40MIMO	Ant1	2437	-30.20	0.94	-29.26	≤8.00	PASS
11N40MIMO	Ant2	2437	-22.85	0.94	-21.91	≤8.00	PASS
11N40MI	total	2437	---	---	-21.18	≤8.00	PASS

MO							
11N40MIMO	Ant1	2452	-28.13	0.64	-27.49	≤8.00	PASS
11N40MIMO	Ant2	2452	-23.30	0.68	-22.62	≤8.00	PASS
11N40MIMO	total	2452	---	---	-21.40	≤8.00	PASS

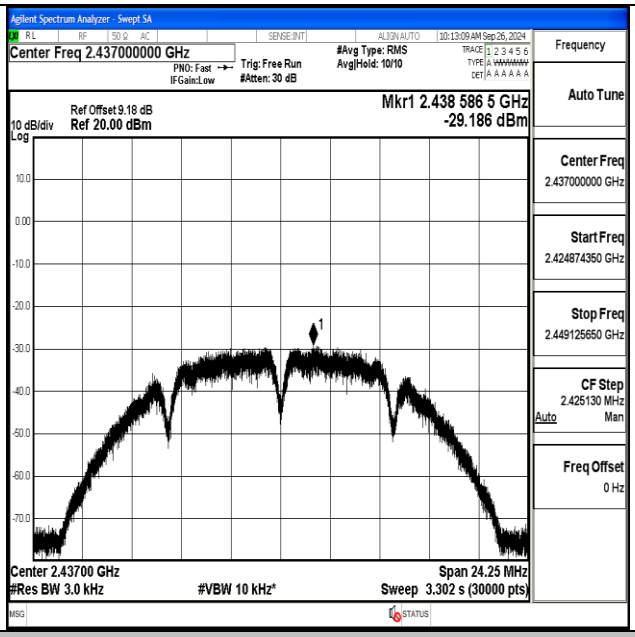
Test Graphs



11B-Ant1-2412-PASS



11B-Ant2-2412-PASS



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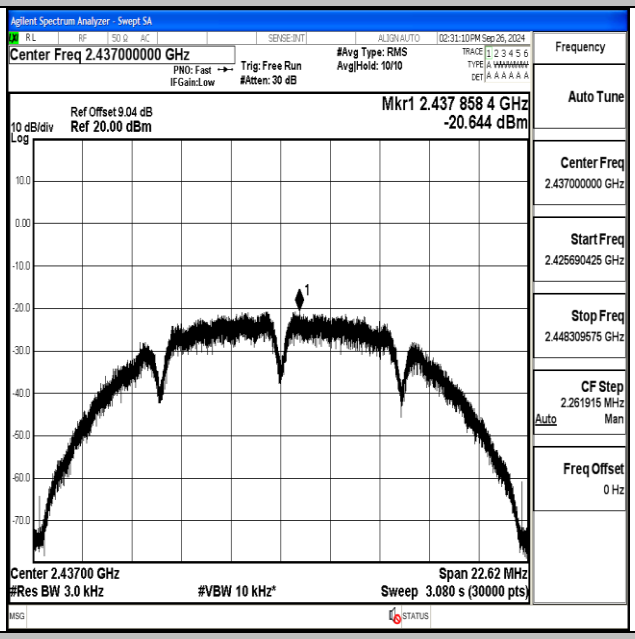

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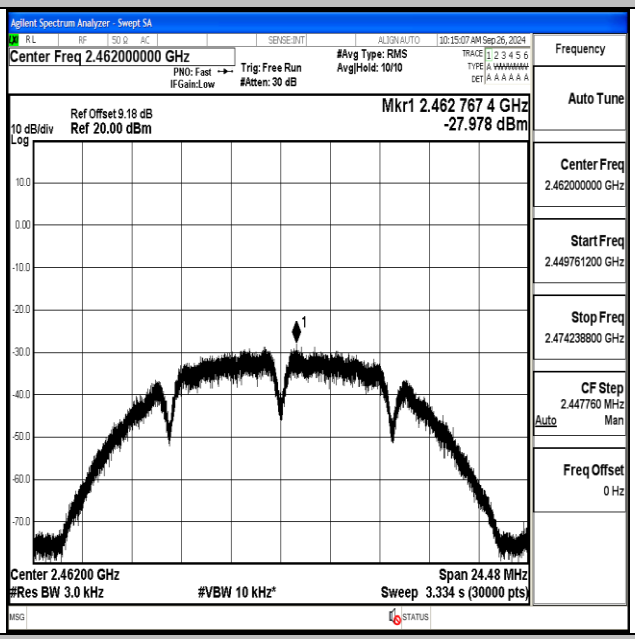

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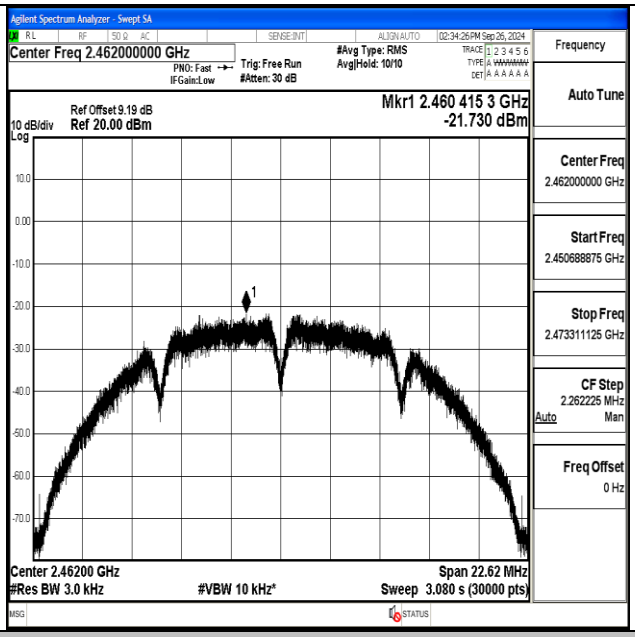

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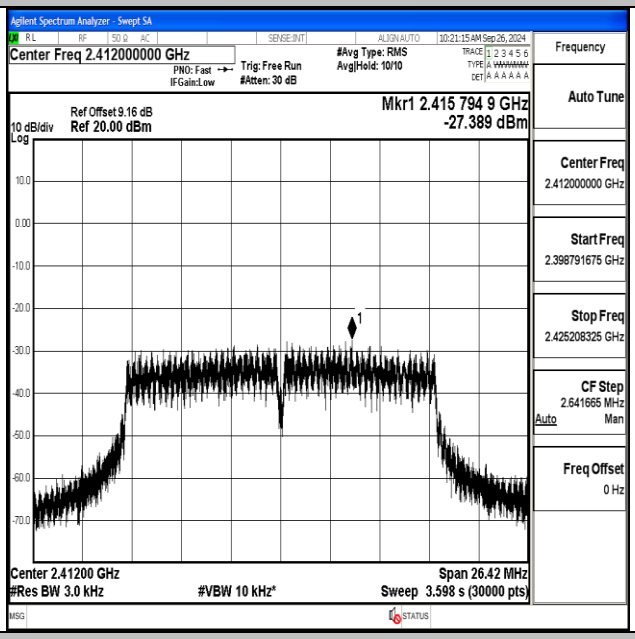
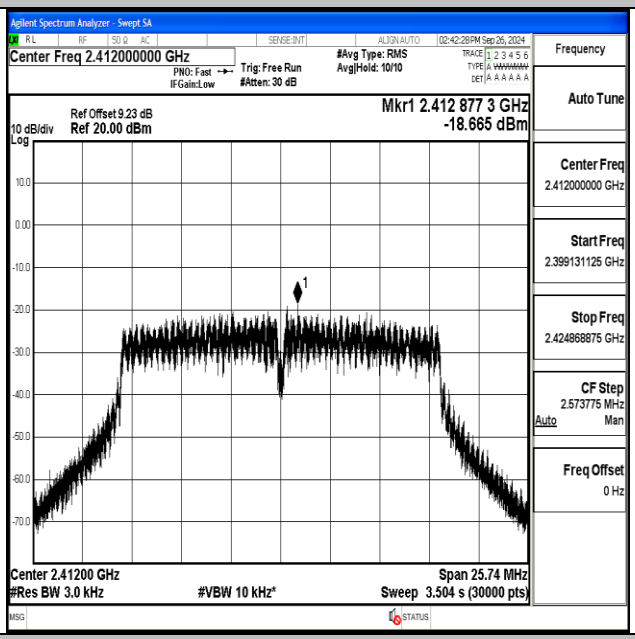


11G-Ant1-2412-PASS



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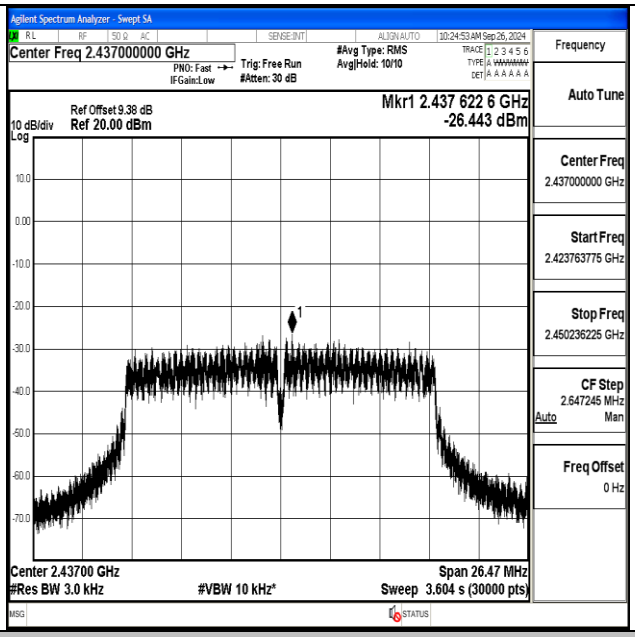

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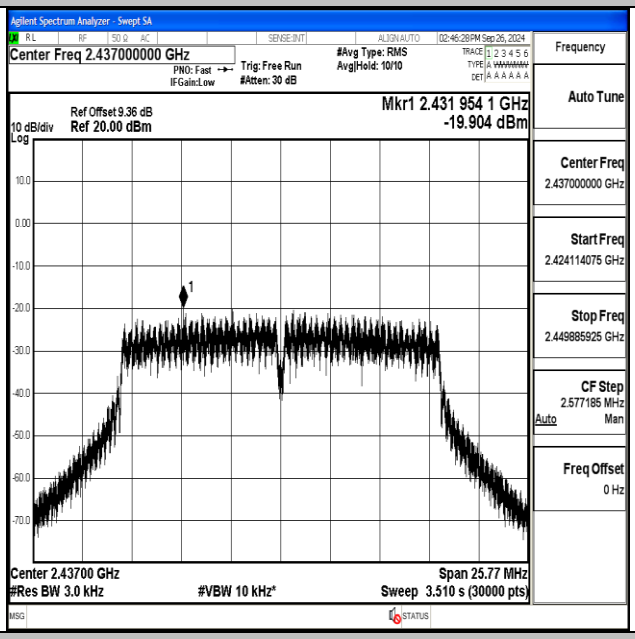

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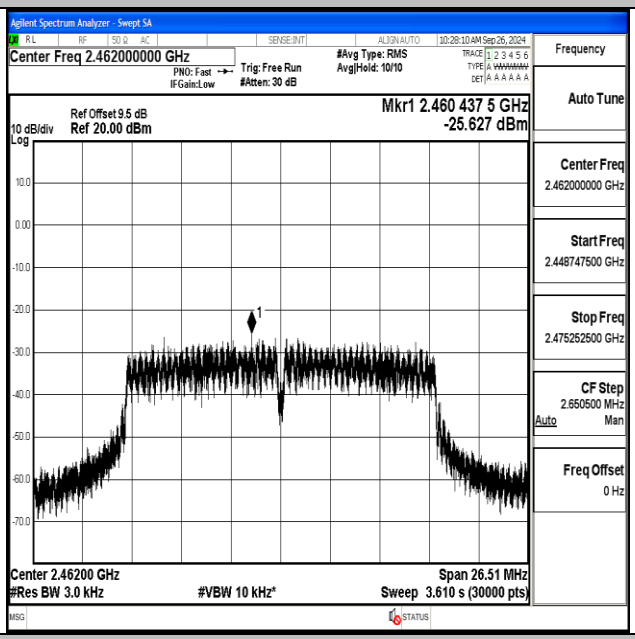

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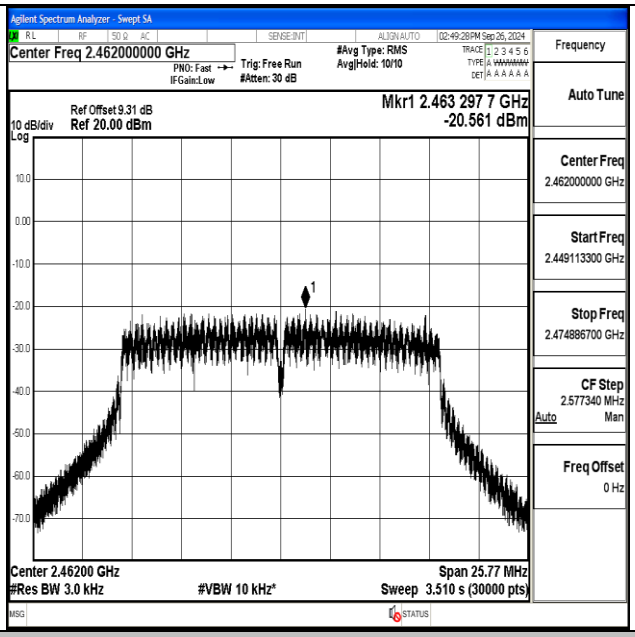

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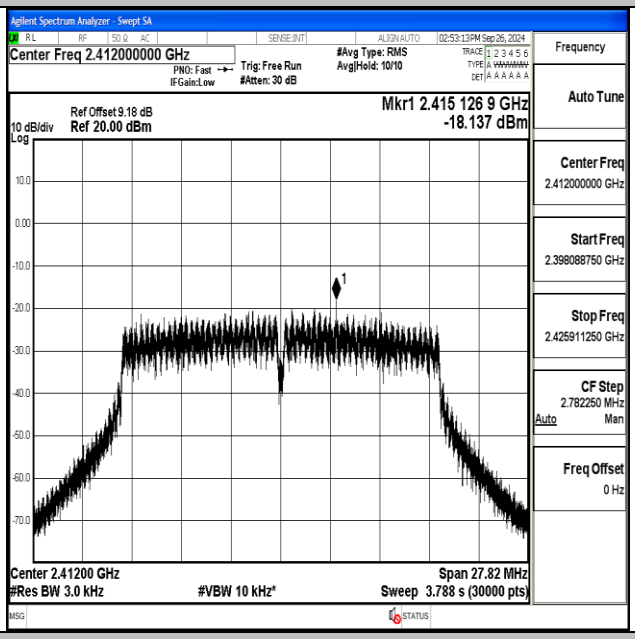

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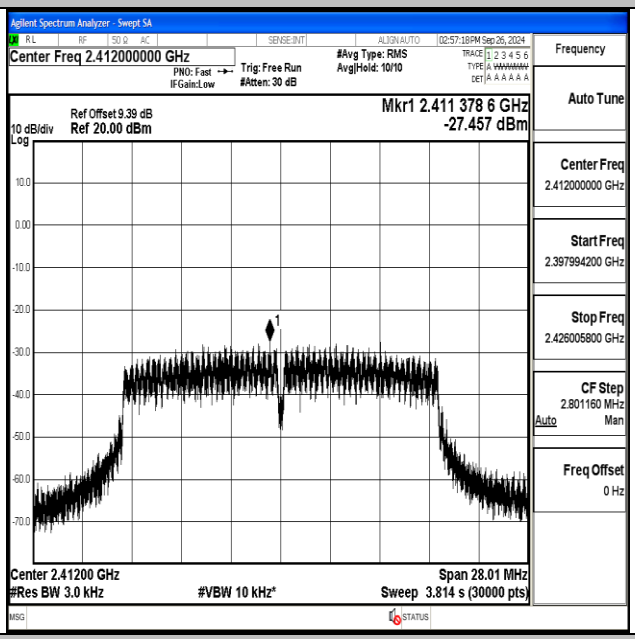
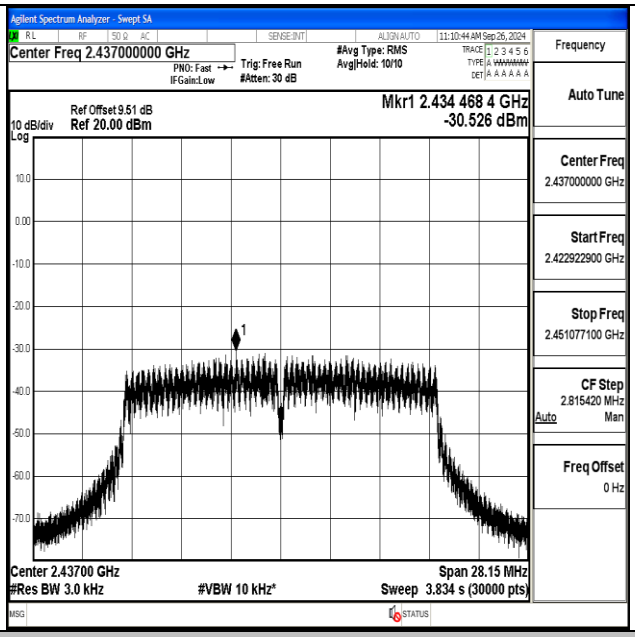


11N20MIMO-Ant1-2412-PASS



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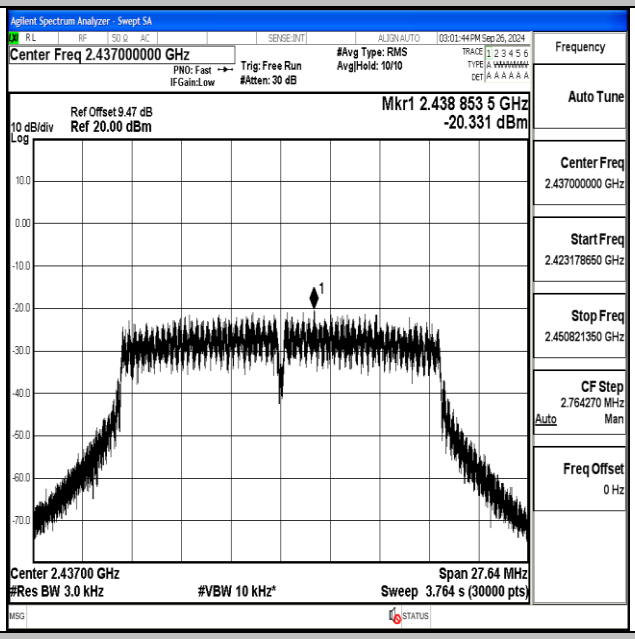

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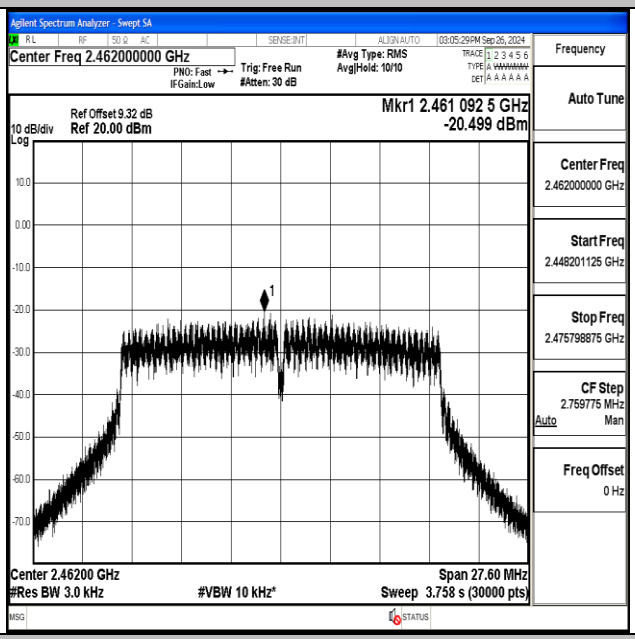

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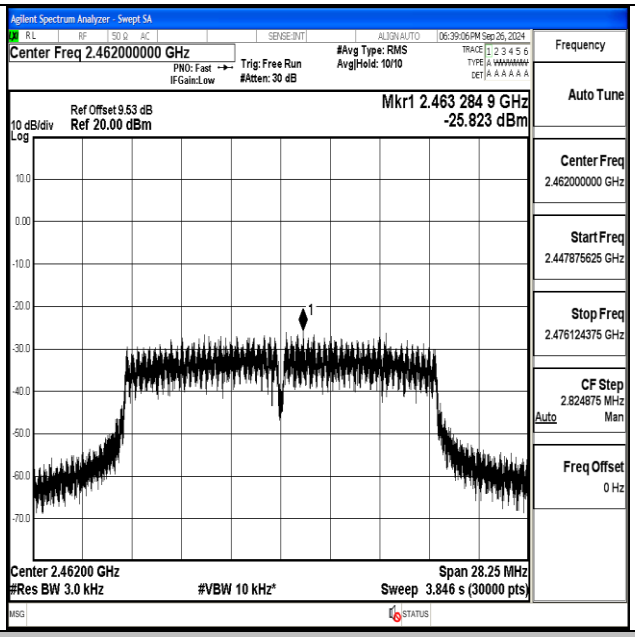

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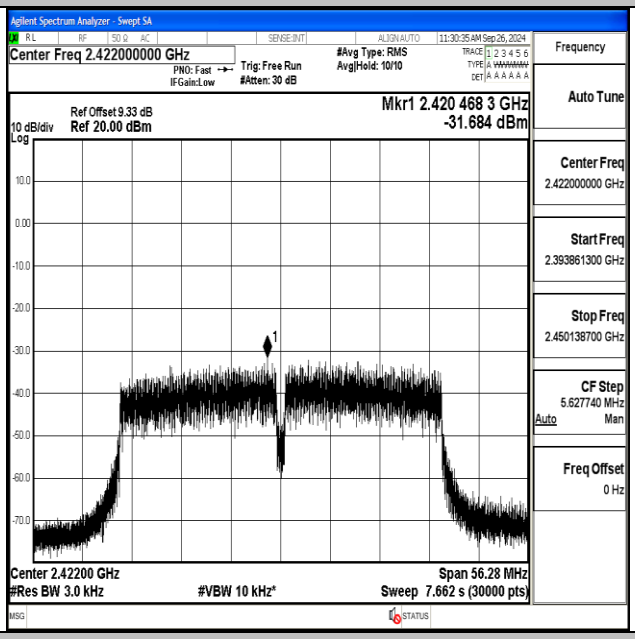
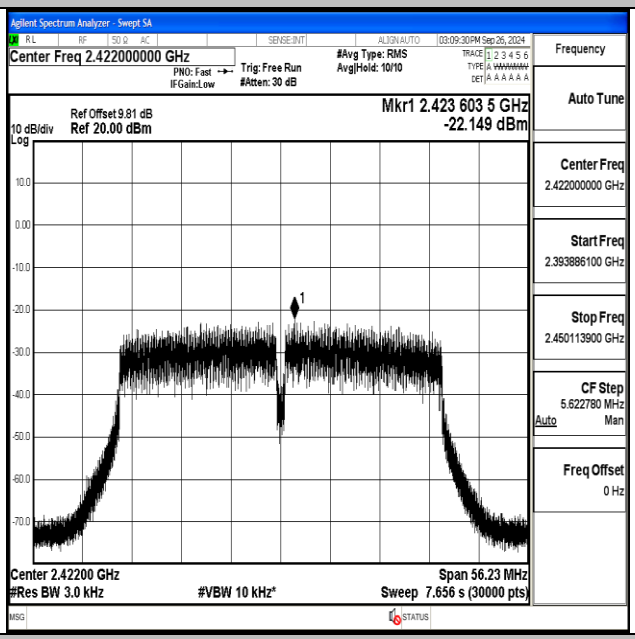
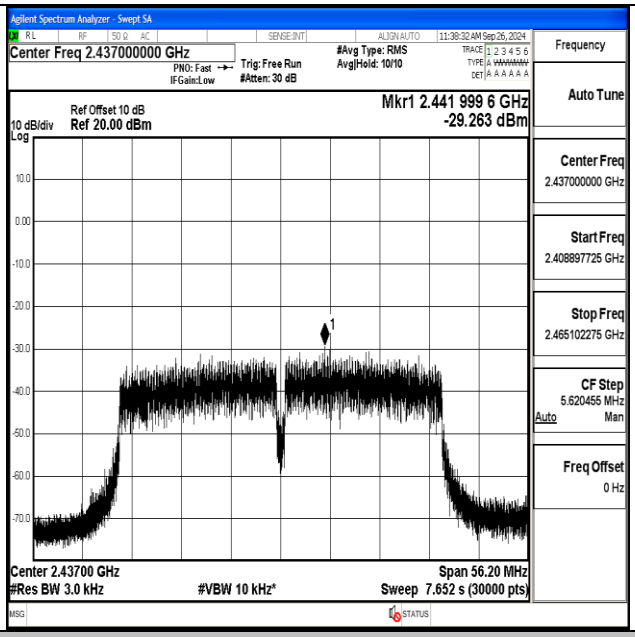


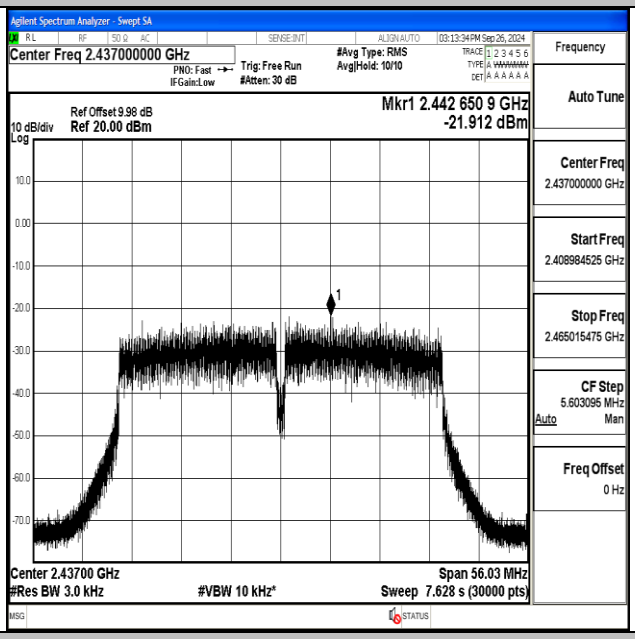
11N40MIMO-Ant1-2422-PASS



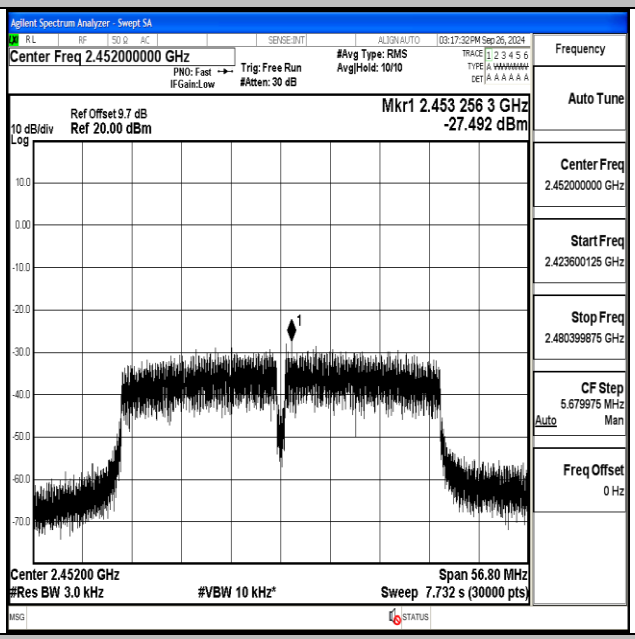
11N40MIMO-Ant2-2422-PASS



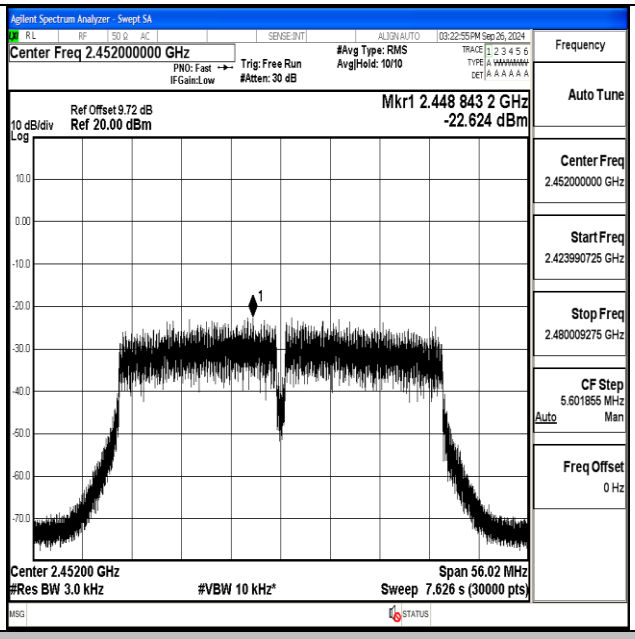
11N40MIMO-Ant1-2437-PASS



11N40MIMO-Ant2-2437-PASS



11N40MIMO-Ant1-2452-PASS



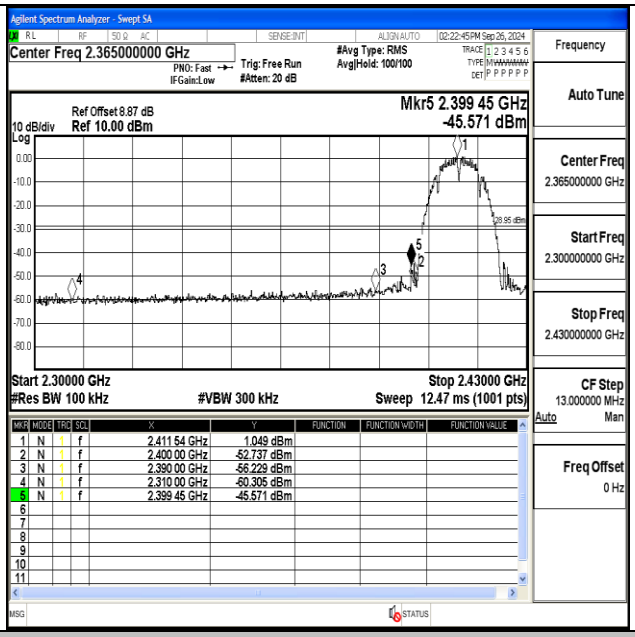
11N40MIMO-Ant2-2452-PASS

Appendix E: Band edge measurements

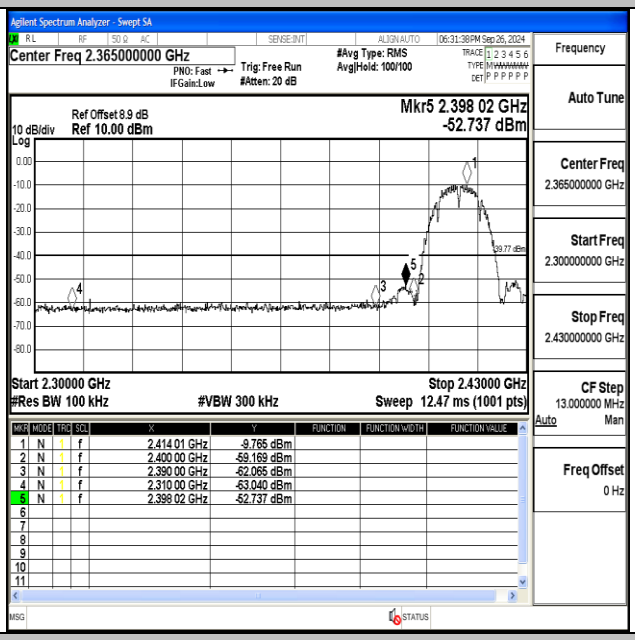
Test Result

Test Mode	Antenna	Ch. Name	Frequency. [MHz]	Ref. Level [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant2	Low	2412	1.05	-45.57	≤-28.95	PASS
11B	Ant1	Low	2412	-9.77	-52.74	≤-39.77	PASS
11B	Ant1	High	2462	-8.74	-48.71	≤-38.74	PASS
11B	Ant2	High	2462	-3.43	-55.99	≤-33.43	PASS
11G	Ant1	Low	2412	-8.38	-39.76	≤-38.38	PASS
11G	Ant2	Low	2412	-1.44	-42.15	≤-31.44	PASS
11G	Ant1	High	2462	-6.61	-45.33	≤-36.61	PASS
11G	Ant2	High	2462	-1.98	-56.39	≤-31.98	PASS
11N20MIMO	Ant2	Low	2412	-1.95	-39.14	≤-31.95	PASS
11N20MIMO	Ant1	Low	2412	-7.73	-38.03	≤-37.73	PASS
11N20MIMO	Ant2	High	2462	-2.63	-56.4	≤-32.63	PASS
11N20MIMO	Ant1	High	2462	-6.61	-42.61	≤-36.61	PASS
11N40MIMO	Ant1	Low	2422	-13.60	-46.64	≤-43.6	PASS
11N40MIMO	Ant2	Low	2422	-3.68	-43.12	≤-33.68	PASS
11N40MIMO	Ant1	High	2452	-12.58	-45.79	≤-42.58	PASS
11N40MIMO	Ant2	High	2452	-3.93	-53.1	≤-33.93	PASS

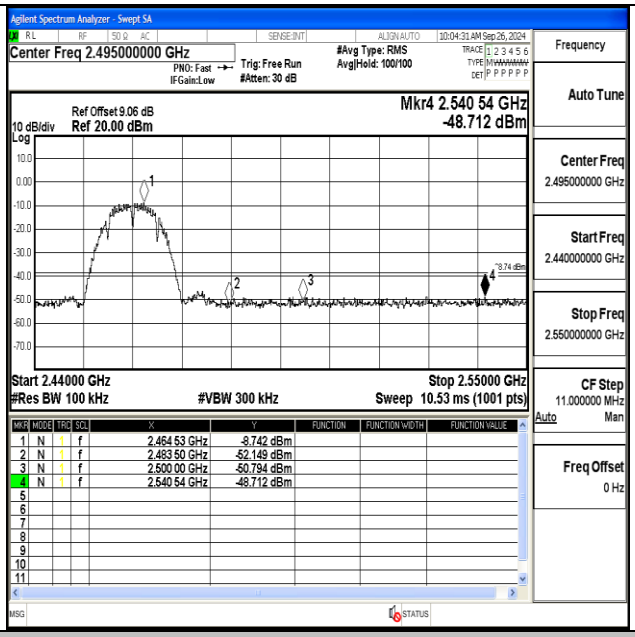
Test Graphs



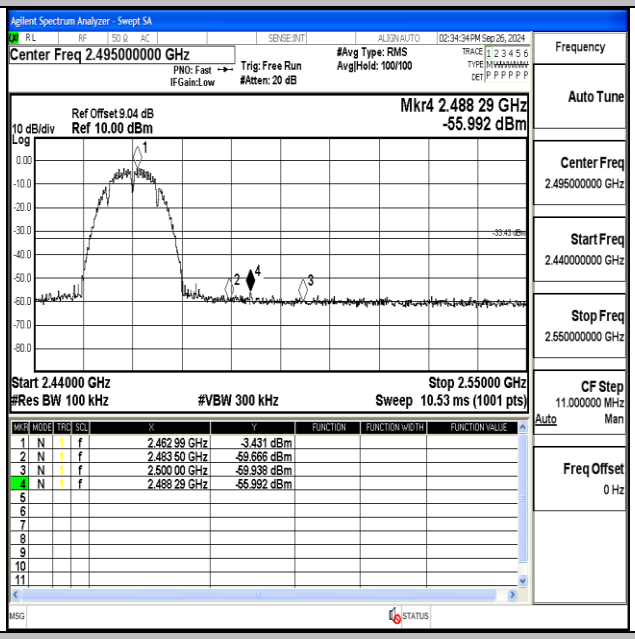
11B-Ant2-2412-PASS



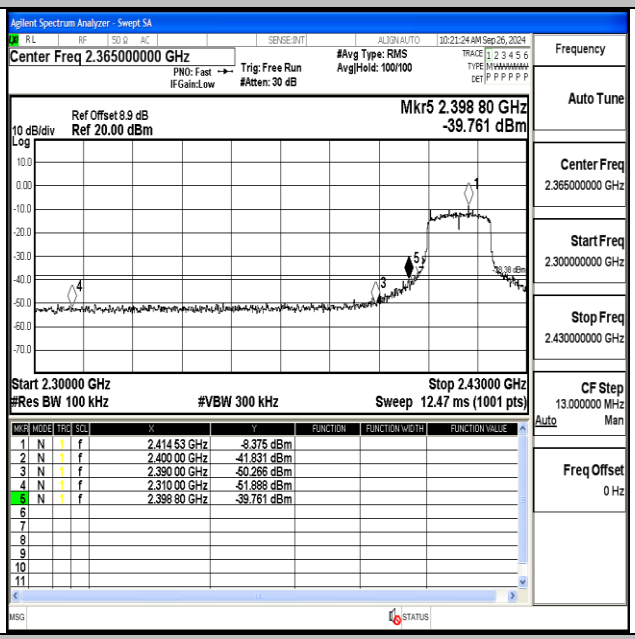
11B-Ant1-2412-PASS



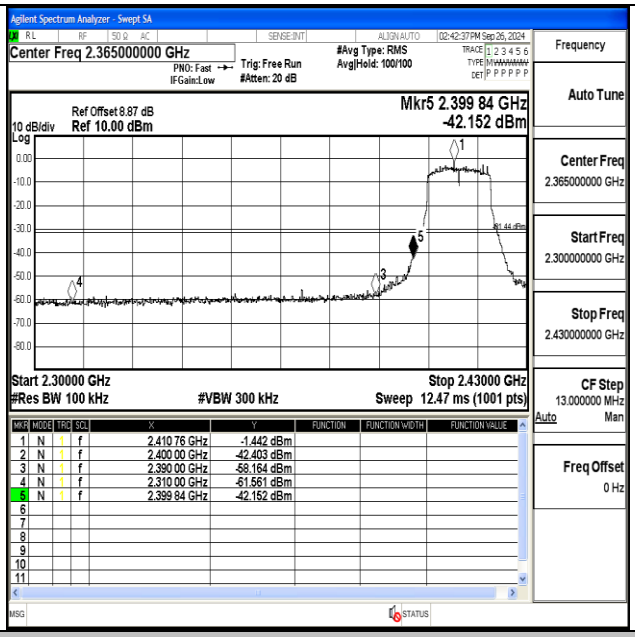
11B-Ant1-2462-PASS



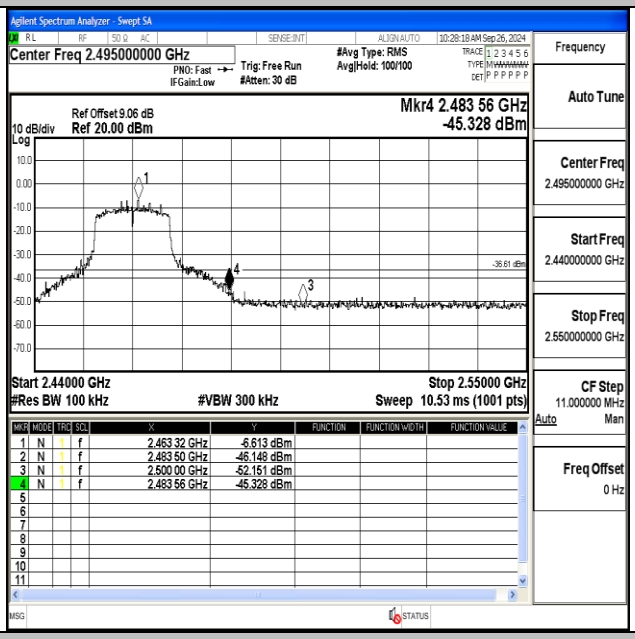
11B-Ant2-2462-PASS



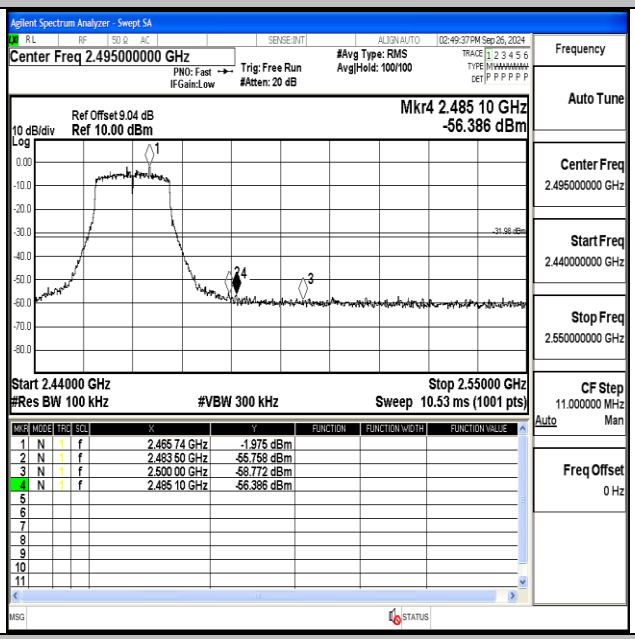
11G-Ant1-2412-PASS



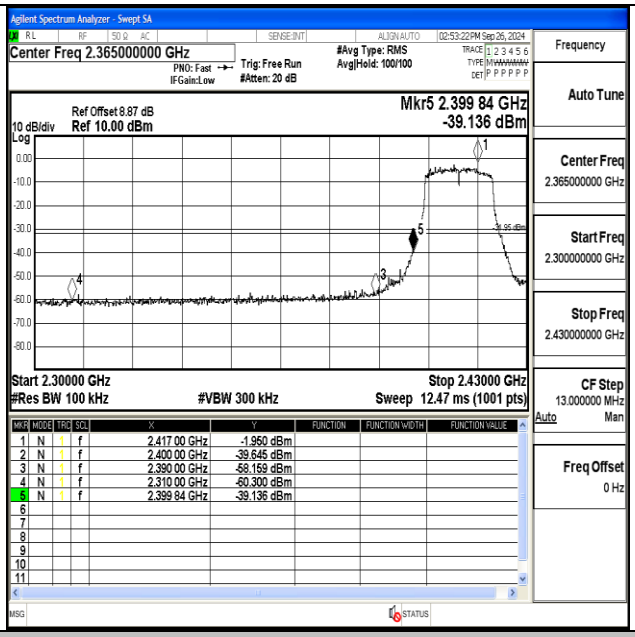
11G-Ant2-2412-PASS



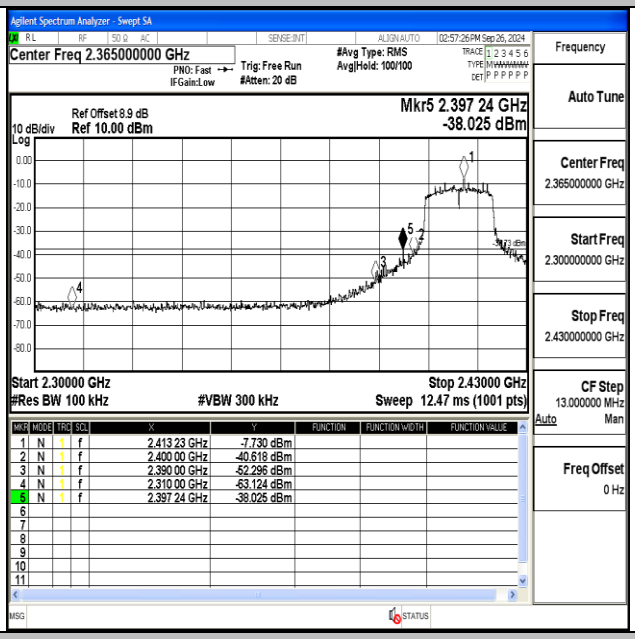
11G-Ant1-2462-PASS



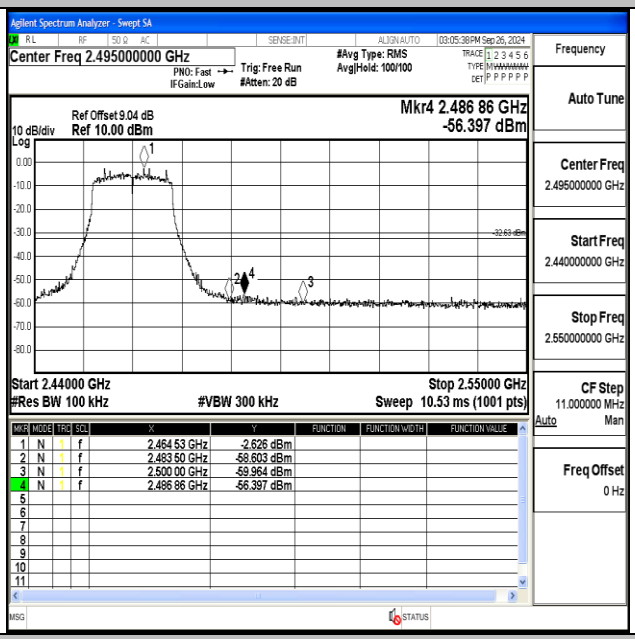
11G-Ant2-2462-PASS



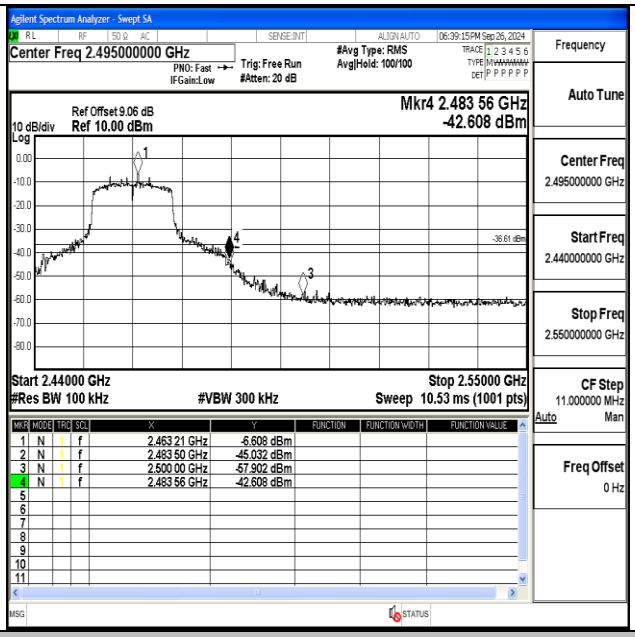
11N20MIMO-Ant2-2412-PASS



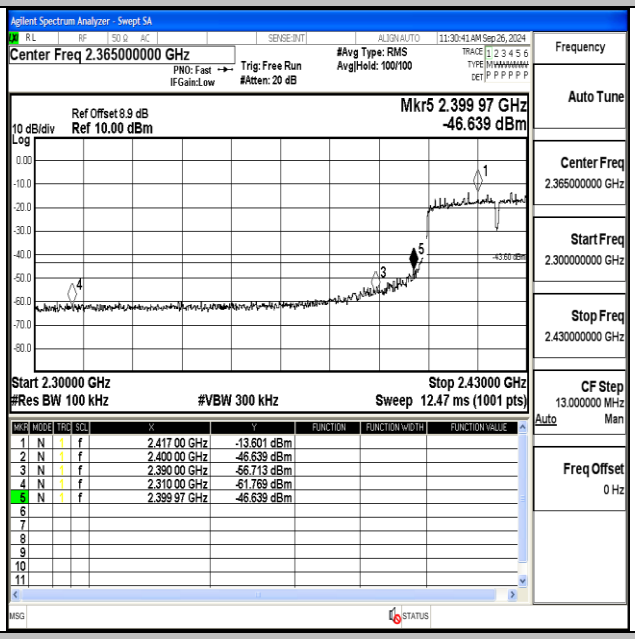
11N20MIMO-Ant1-2412-PASS



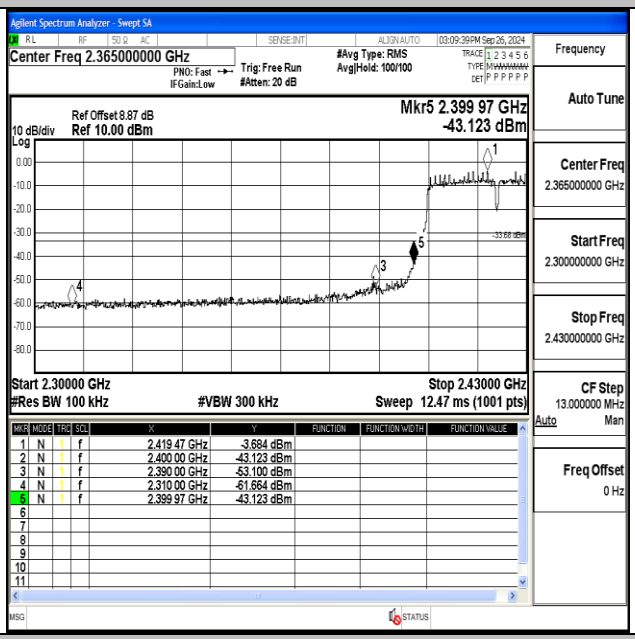
11N20MIMO-Ant2-2462-PASS



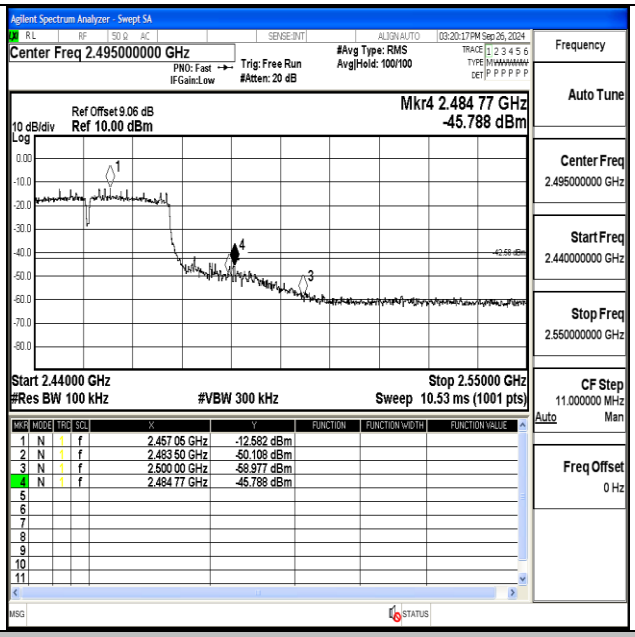
11N20MIMO-Ant1-2462-PASS



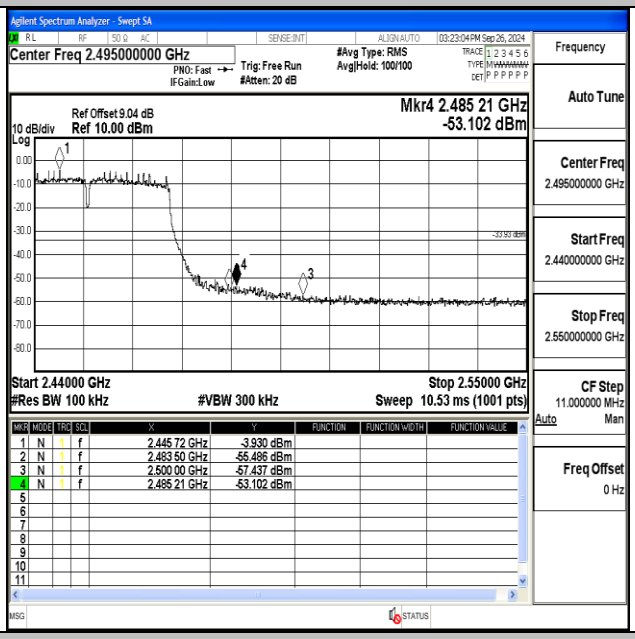
11N40MIMO-Ant1-2422-PASS



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	-11.43	-11.43	---	PASS
11B	Ant2	2412	0~Reference	0.18	0.18	---	PASS
11B	Ant1	2412	30~1000	-11.43	-62.46	≤-41.43	PASS
11B	Ant2	2412	30~1000	0.18	-62.85	≤-29.82	PASS
11B	Ant1	2412	1000~26500	-11.43	-45.5	≤-41.43	PASS
11B	Ant2	2412	1000~26500	0.18	-45.32	≤-29.82	PASS
11B	Ant1	2437	0~Reference	-9.15	-9.15	---	PASS
11B	Ant2	2437	0~Reference	-0.34	-0.34	---	PASS
11B	Ant1	2437	30~1000	-9.15	-62.6	≤-39.15	PASS
11B	Ant2	2437	30~1000	-0.34	-62.92	≤-30.34	PASS
11B	Ant1	2437	1000~26500	-9.15	-45.7	≤-39.15	PASS
11B	Ant2	2437	1000~26500	-0.34	-43.84	≤-30.34	PASS
11B	Ant1	2462	0~Reference	-8.00	-8.00	---	PASS
11B	Ant2	2462	0~Reference	-4.43	-4.43	---	PASS
11B	Ant1	2462	30~1000	-8.00	-62.9	≤-38	PASS
11B	Ant2	2462	30~1000	-4.43	-40.39	≤-34.43	PASS
11B	Ant1	2462	1000~26500	-8.00	-45.34	≤-38	PASS
11B	Ant2	2462	1000~26500	-4.43	-45.31	≤-34.43	PASS
11G	Ant1	2412	0~Reference	-11.06	-11.06	---	PASS
11G	Ant2	2412	0~Reference	-3.80	-3.80	---	PASS
11G	Ant1	2412	30~1000	-11.06	-61.52	≤-41.06	PASS
11G	Ant2	2412	30~1000	-3.80	-62.73	≤-33.8	PASS
11G	Ant1	2412	1000~26500	-11.06	-44.66	≤-41.06	PASS
11G	Ant2	2412	1000~26500	-3.80	-45.37	≤-33.8	PASS
11G	Ant1	2437	0~Reference	-8.24	-8.24	---	PASS
11G	Ant2	2437	0~Reference	-4.18	-4.18	---	PASS
11G	Ant1	2437	30~1000	-8.24	-62.61	≤-38.24	PASS
11G	Ant2	2437	30~1000	-4.18	-62.34	≤-34.18	PASS
11G	Ant1	2437	1000~26500	-8.24	-45.56	≤-38.24	PASS
11G	Ant2	2437	1000~26500	-4.18	-44.96	≤-34.18	PASS
11G	Ant1	2462	0~Reference	-9.63	-9.63	---	PASS
11G	Ant2	2462	0~Reference	-1.81	-1.81	---	PASS
11G	Ant1	2462	30~1000	-9.63	-61.25	≤-39.63	PASS
11G	Ant2	2462	30~1000	-1.81	-62.94	≤-31.81	PASS
11G	Ant1	2462	1000~26500	-9.63	-44.57	≤-39.63	PASS
11G	Ant2	2462	1000~26500	-1.81	-44.73	≤-31.81	PASS
11N20MIMO	Ant2	2412	0~Reference	-4.52	-4.52	---	PASS
11N20MIMO	Ant1	2412	0~Reference	-11.33	-11.33	---	PASS
11N20MIMO	Ant2	2412	30~1000	-4.52	-62.63	≤-34.52	PASS
11N20MIMO	Ant1	2412	30~1000	-11.33	-62.06	≤-41.33	PASS
11N20MIMO	Ant2	2412	1000~26500	-4.52	-45.39	≤-34.52	PASS