

Appendix Test Data for BT(BDR/EDR) (Conducted Measurement)

Product Name: Wireless Diagnostics Module / Vehicle Communication Interface

Trade Mark: XTOOL, AutoProPAD, Anyscan

Test Model: A104

FCC ID: 2AW3IA104

Environmental Conditions

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

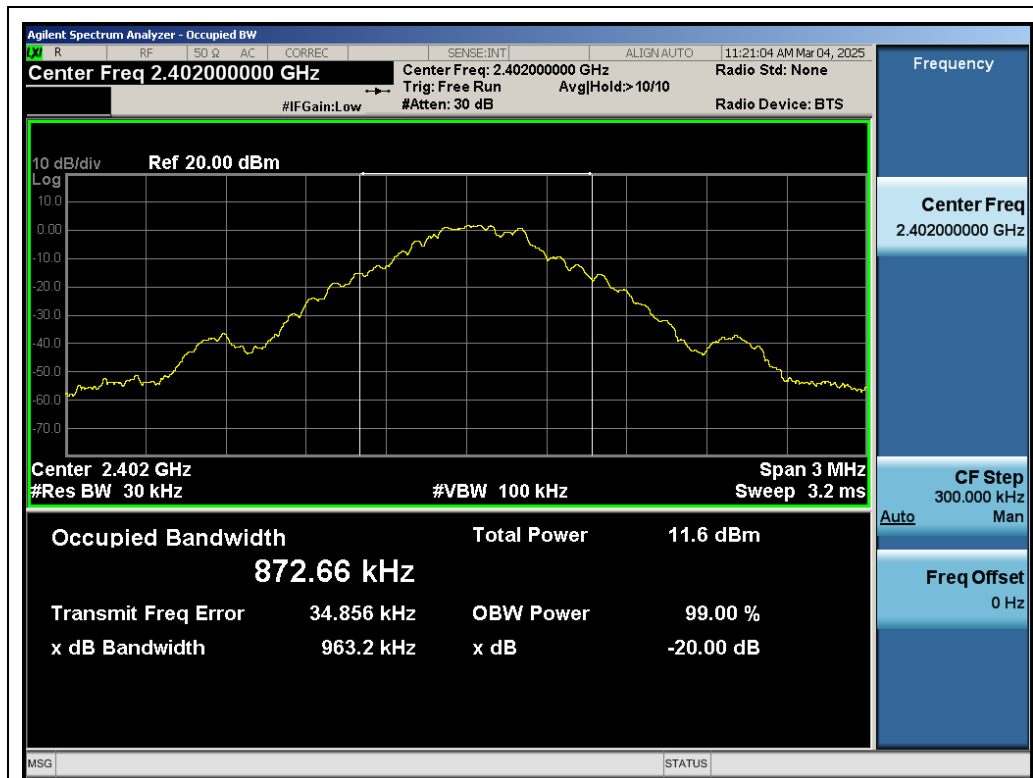
Appendix A: 20dB Emission Bandwidth& Occupied Channel

Bandwidth

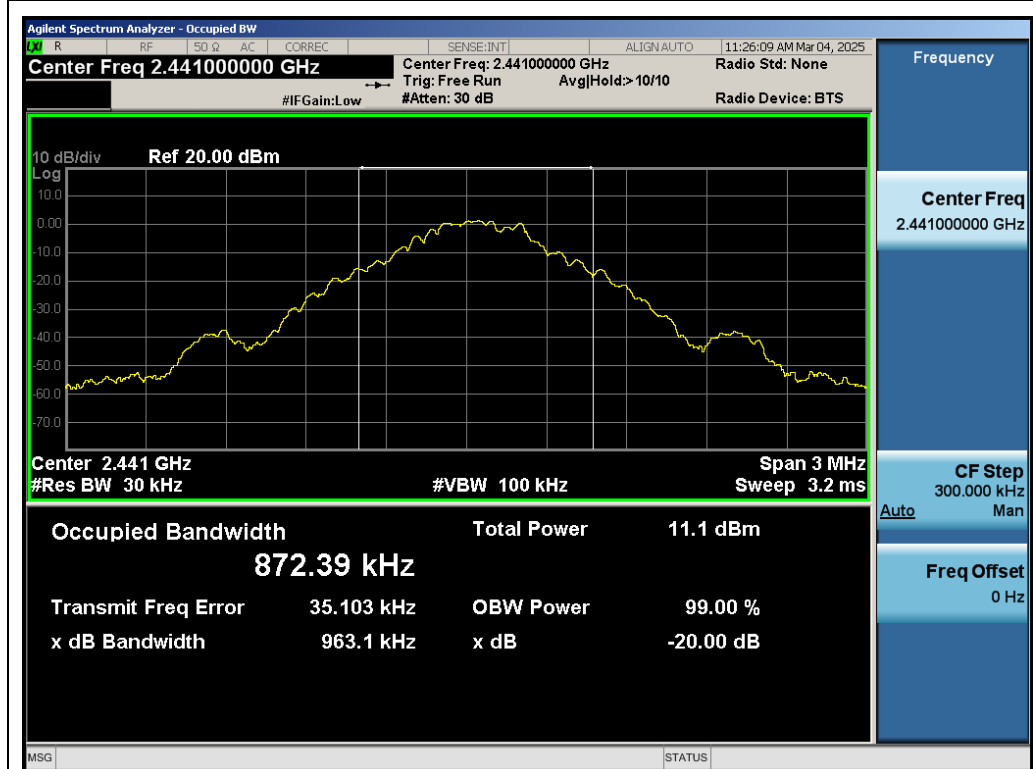
Test Result

Test Mode	Test Frequency	99% Occupied Bandwidth	-20dB Bandwidth	Limits	Pass or Fail
GFSK	2402	0.873	0.963	N/A	Pass
	2441	0.872	0.963	N/A	Pass
	2480	0.872	0.964	N/A	Pass
π /4-DQPSK	2402	1.165	1.307	N/A	Pass
	2441	1.165	1.310	N/A	Pass
	2480	1.164	1.307	N/A	Pass
8DPSK	2402	1.169	1.303	N/A	Pass
	2441	1.170	1.303	N/A	Pass
	2480	1.169	1.303	N/A	Pass

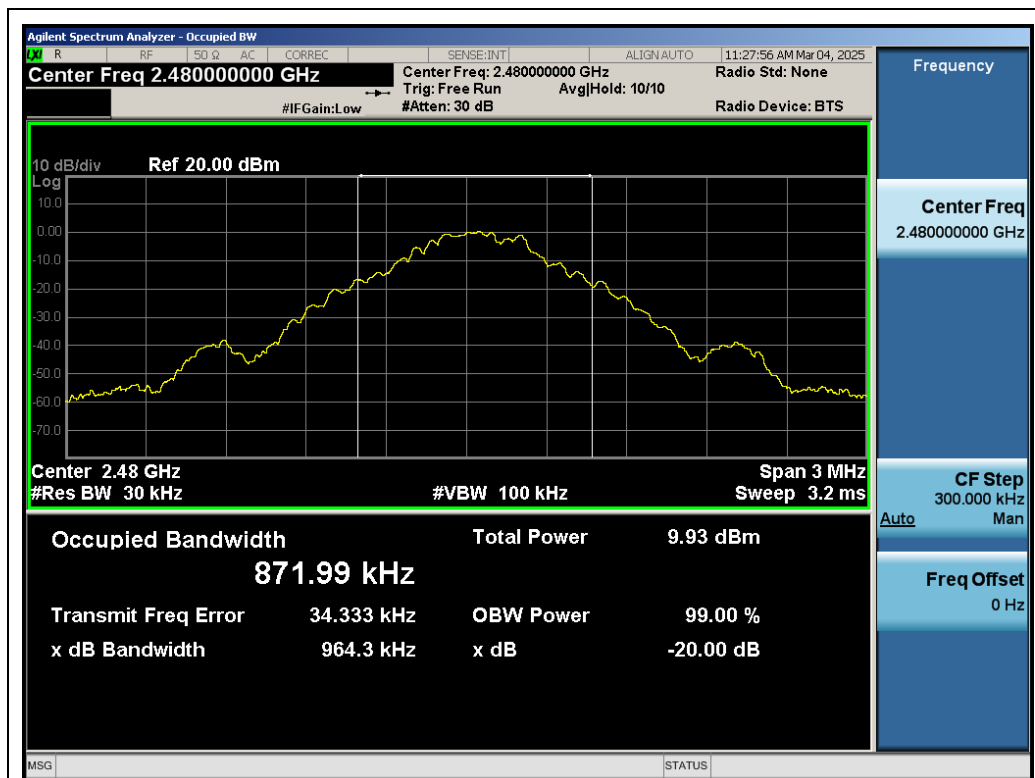
Test Graphs



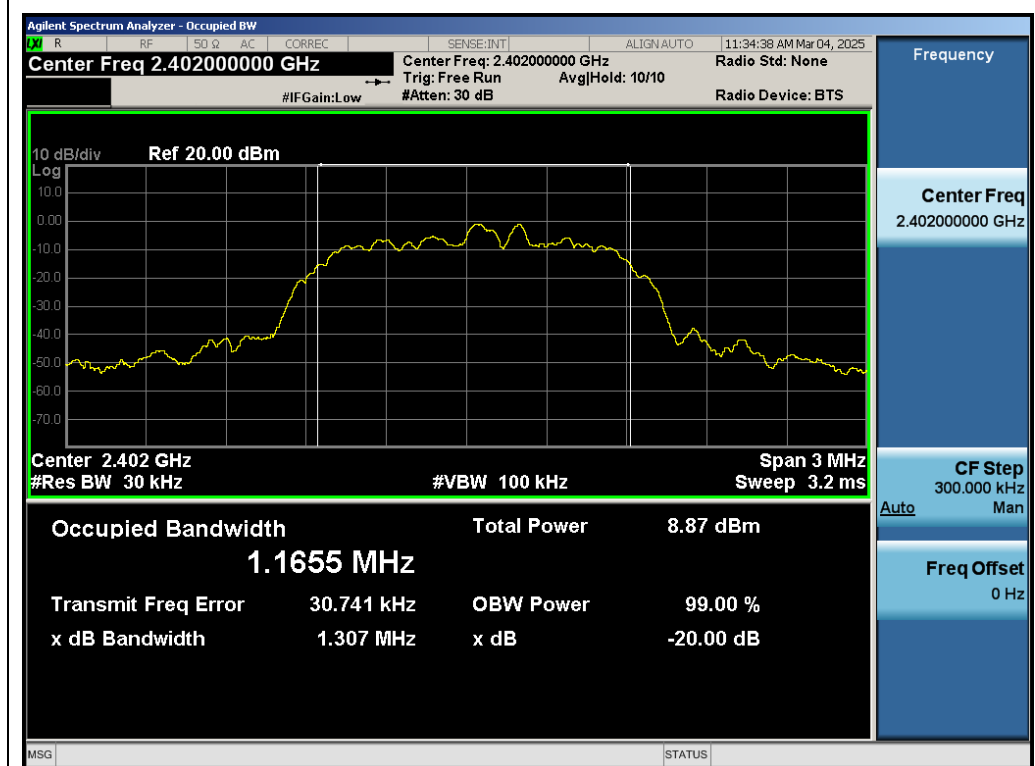
Test_Graph_BR_ANT1_2402_1Mbps_OBW



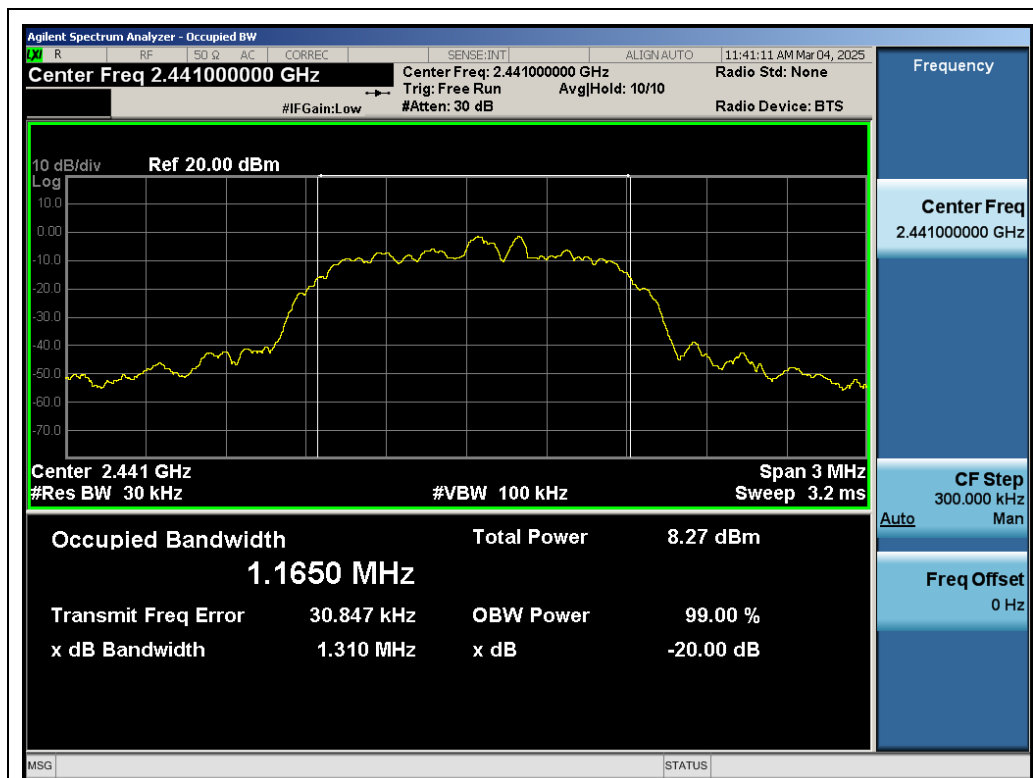
Test_Graph_BR_ANT1_2441_1Mbps_OBW



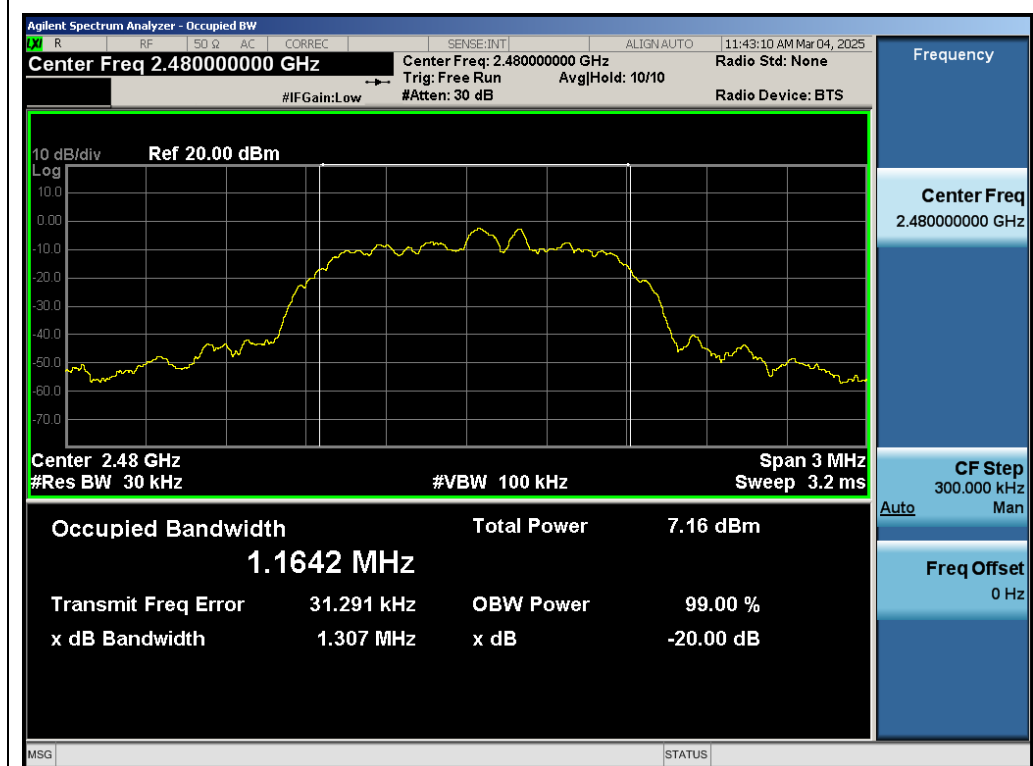
Test_Graph_BR_ANT1_2480_1Mbps_OBW



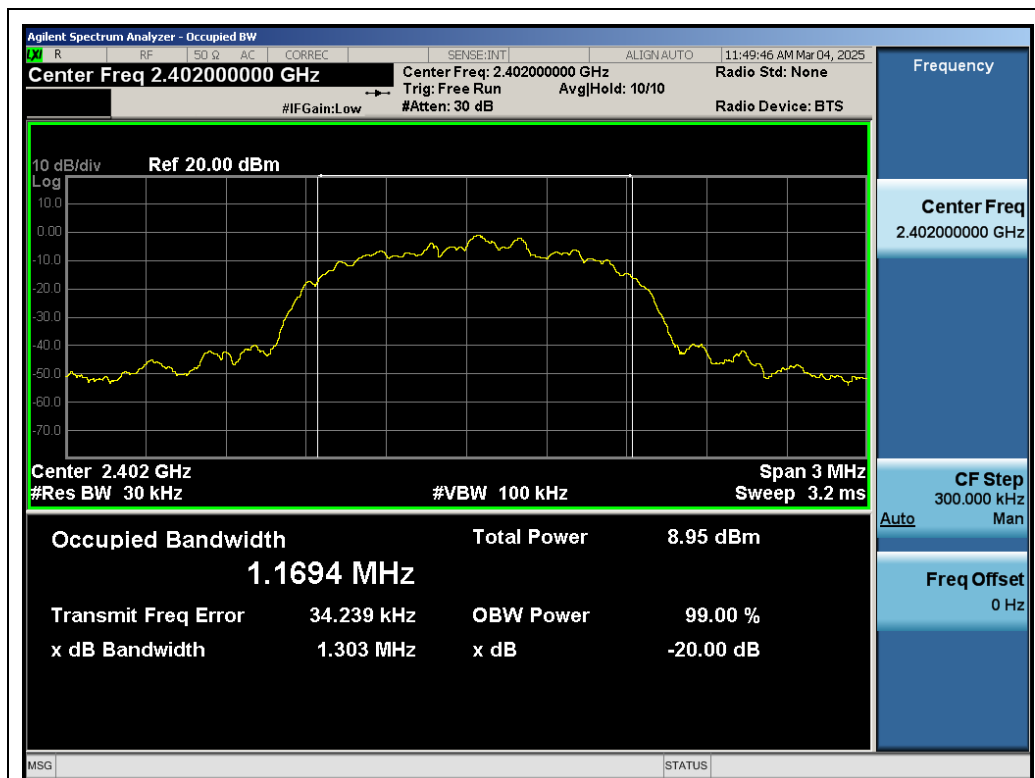
Test_Graph_EDR_ANT1_2402_2Mbps_OBW



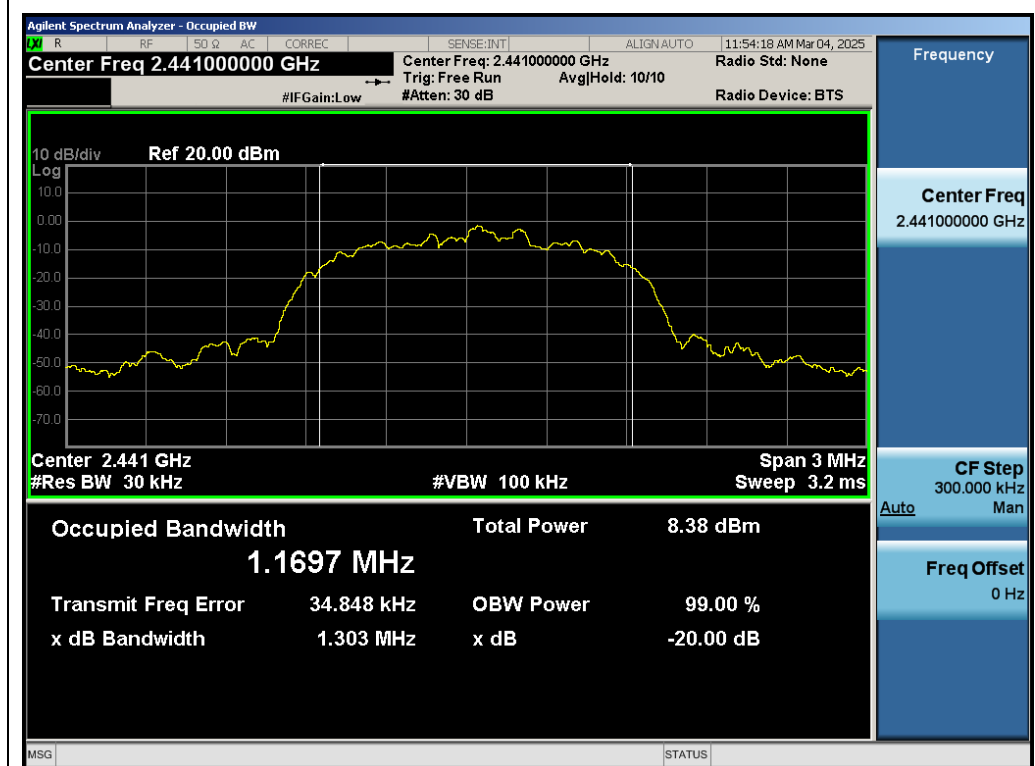
Test_Graph_EDR_ANT1_2441_2Mbps_OBW



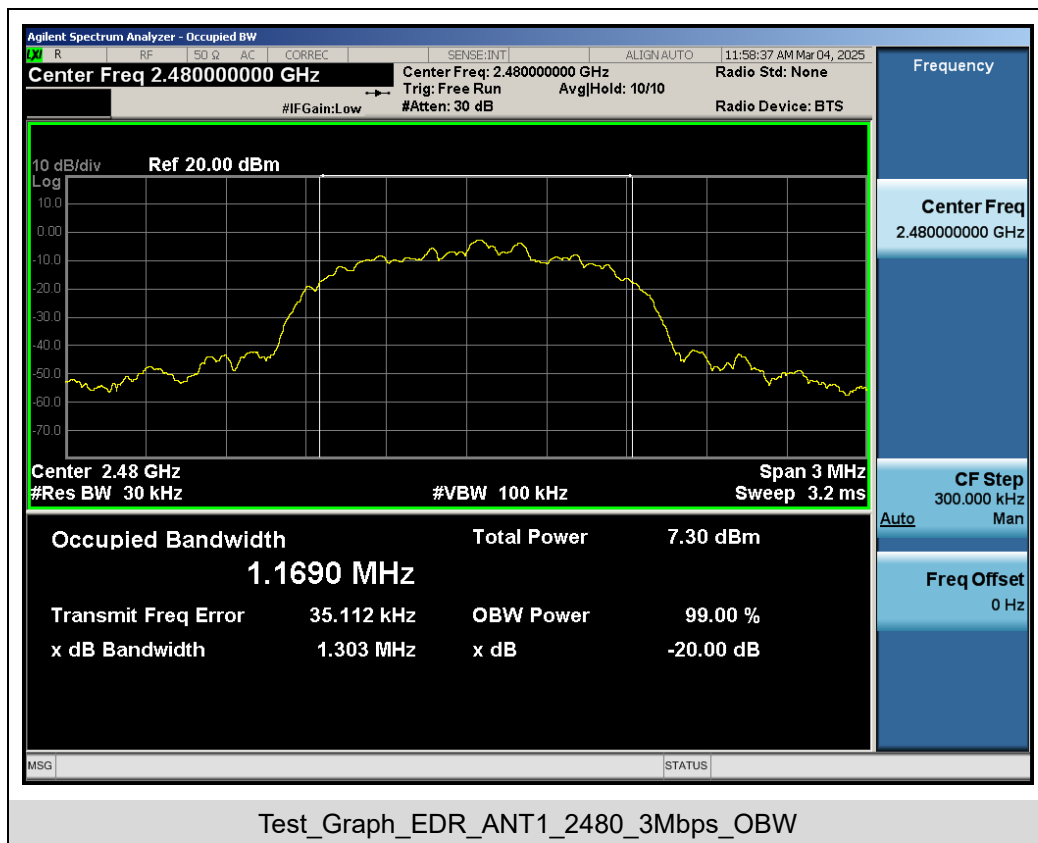
Test_Graph_EDR_ANT1_2480_2Mbps_OBW



Test_Graph_EDR_ANT1_2402_3Mbps_OBW



Test_Graph_EDR_ANT1_2441_3Mbps_OBW

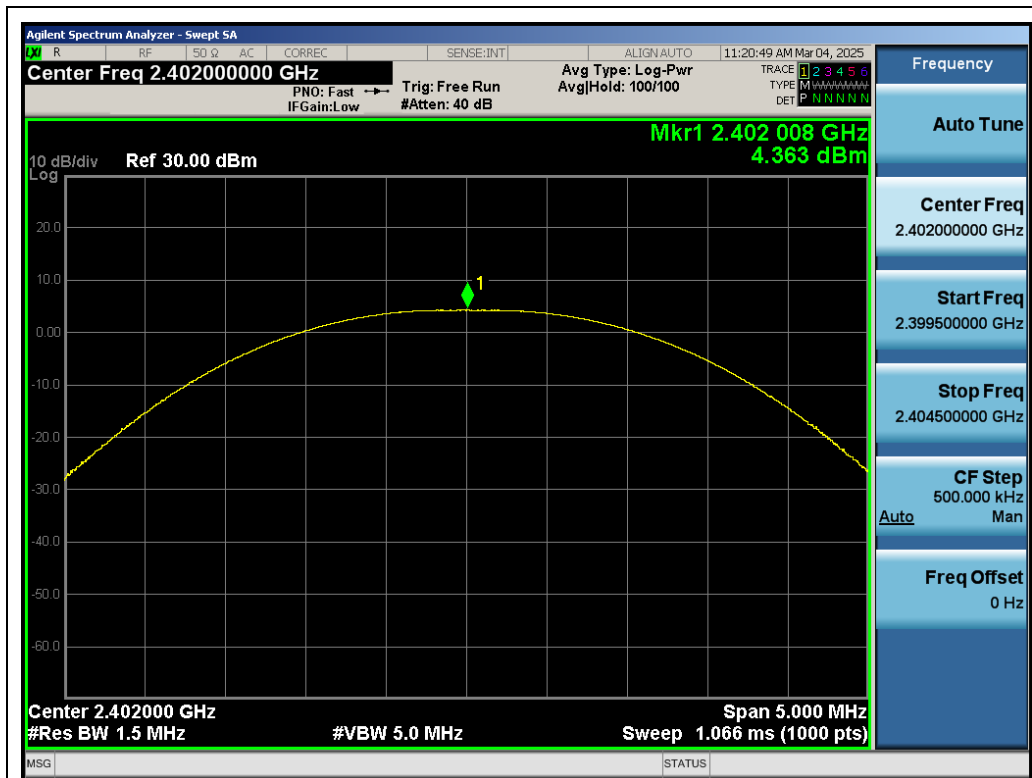


Appendix B: Maximum peak conducted output power

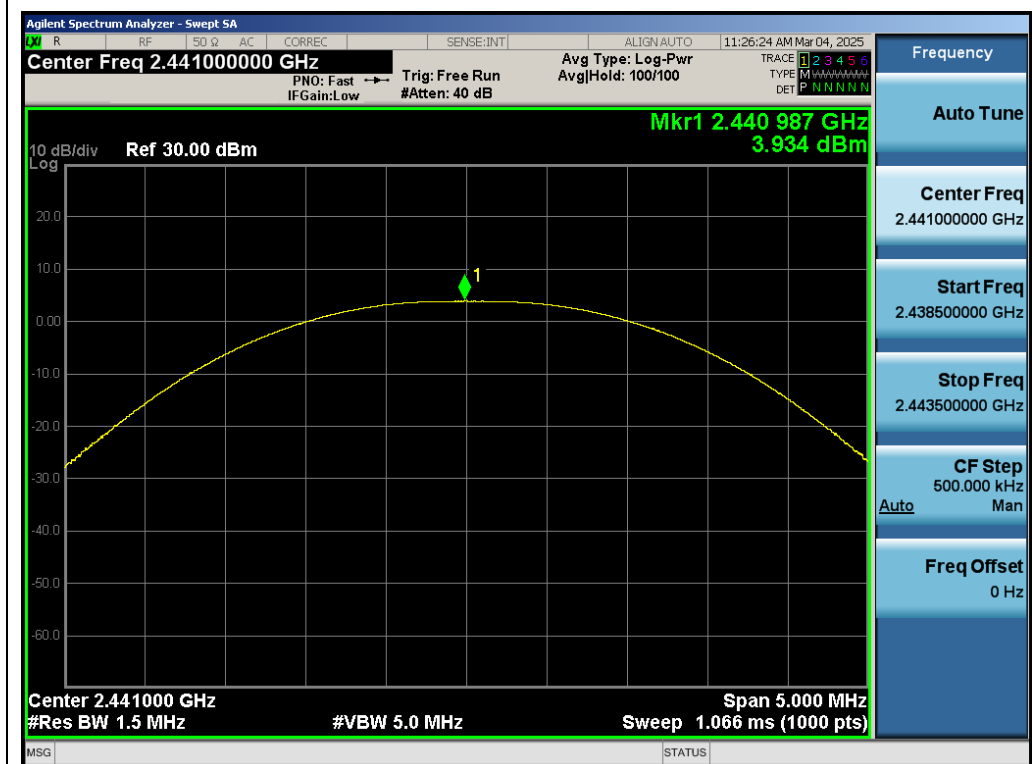
Test Result

Test Mode	Test Frequency (MHz)	Peak Power (dBm)	Limits (dBm)	Pass or Fail
GFSK	2402	4.363	≤ 21	Pass
	2441	3.934	≤ 21	Pass
	2480	2.654	≤ 21	Pass
$\pi/4$ -DQPSK	2402	2.939	≤ 21	Pass
	2441	2.415	≤ 21	Pass
	2480	1.208	≤ 21	Pass
8DPSK	2402	3.337	≤ 21	Pass
	2441	2.874	≤ 21	Pass
	2480	1.642	≤ 21	Pass

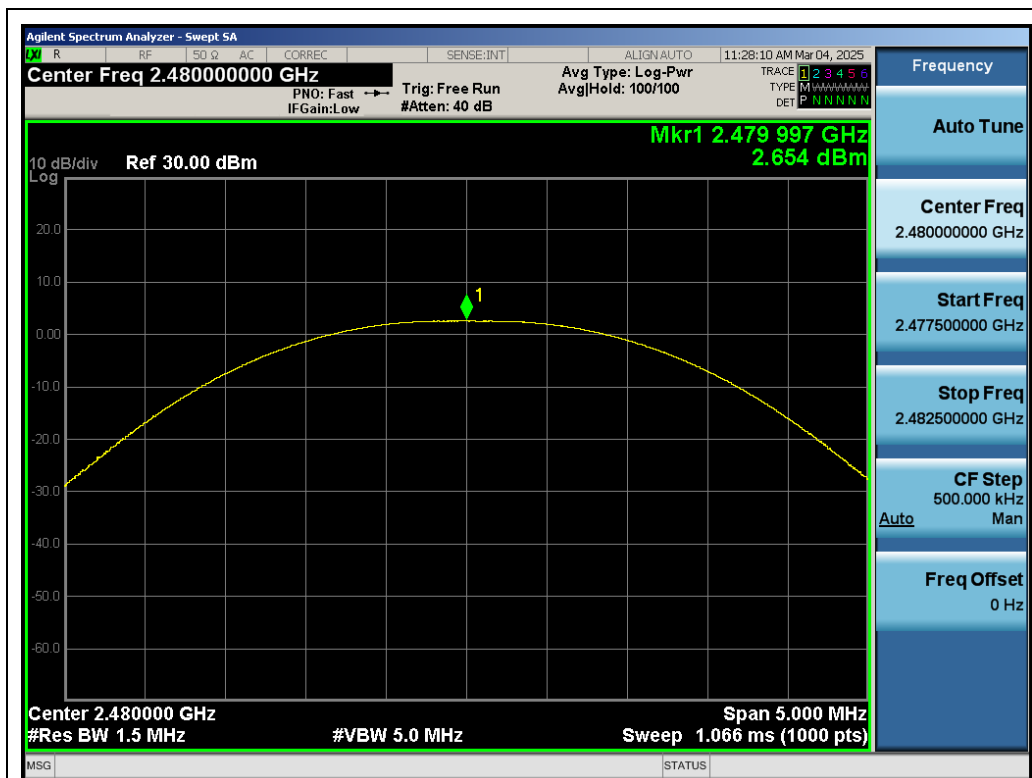
Test Graphs



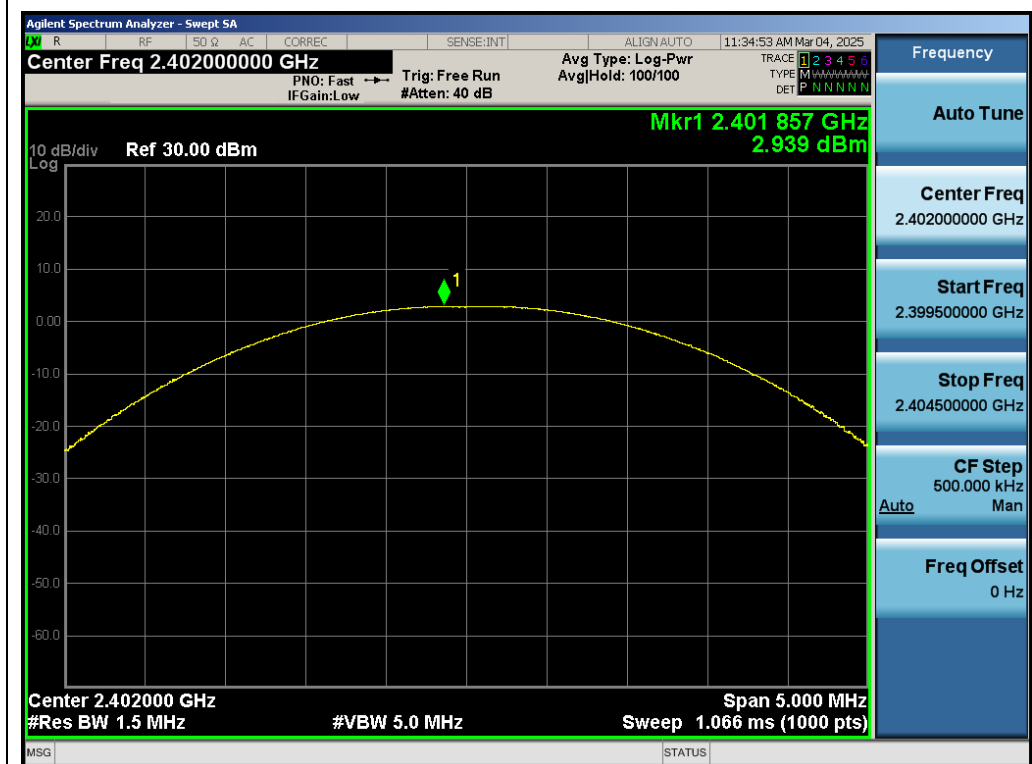
Test_Graph_BR_ANT1_2402_1Mbps_Peak Power



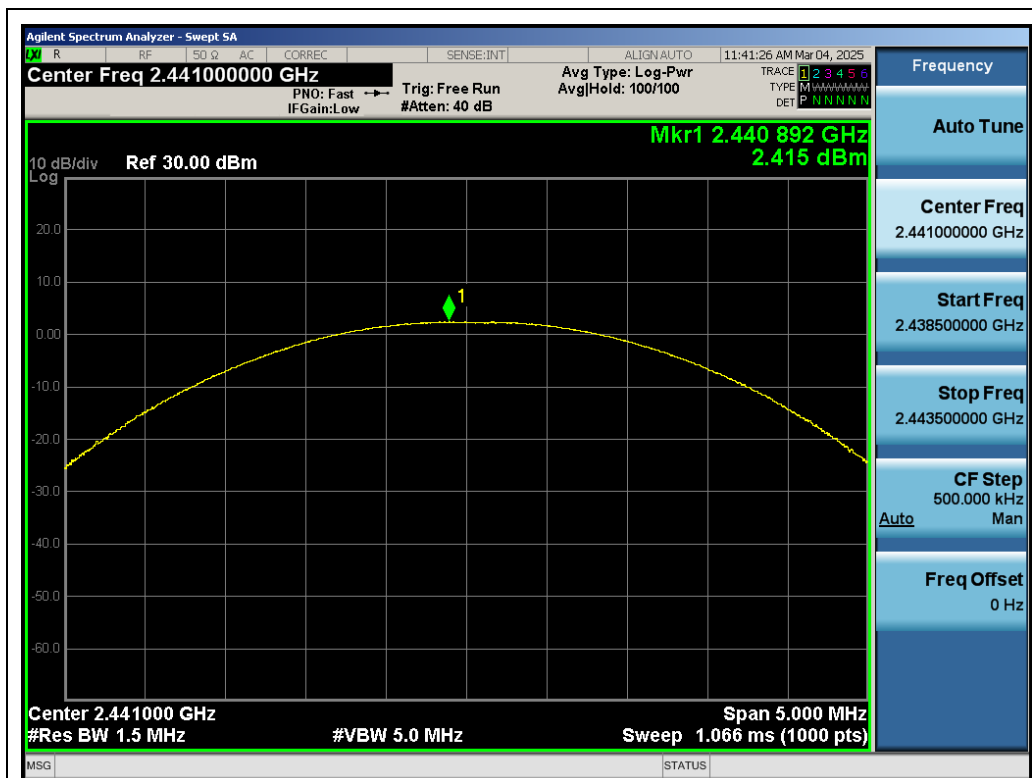
Test_Graph_BR_ANT1_2441_1Mbps_Peak Power



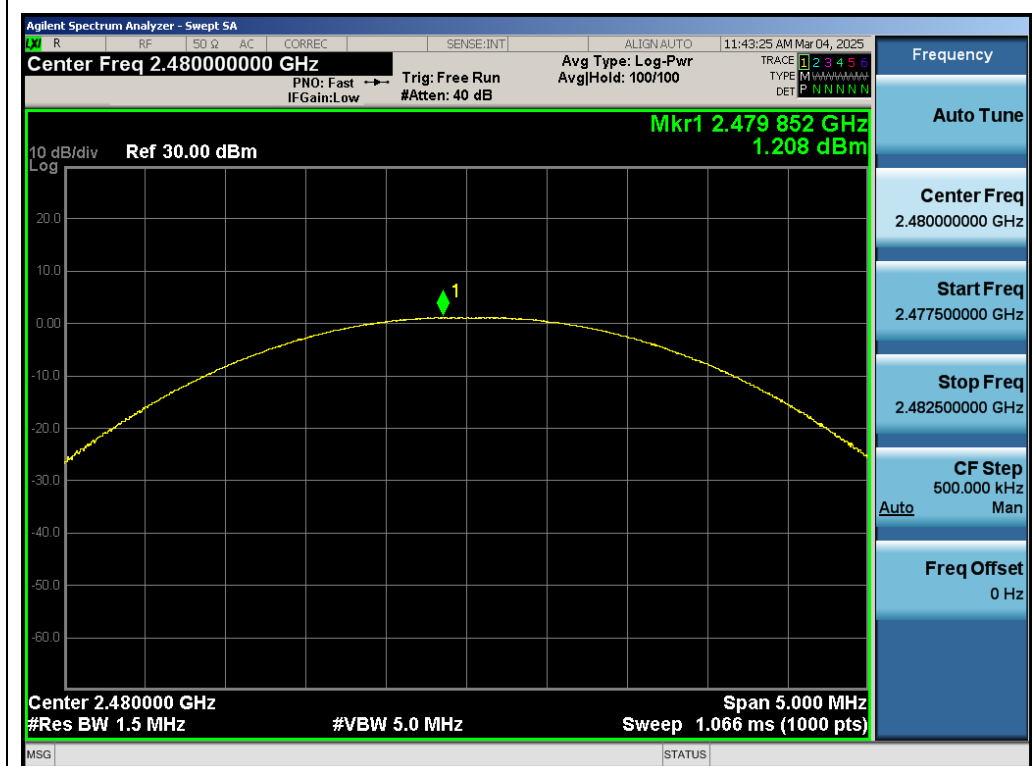
Test_Graph_BR_ANT1_2480_1Mbps_Peak Power



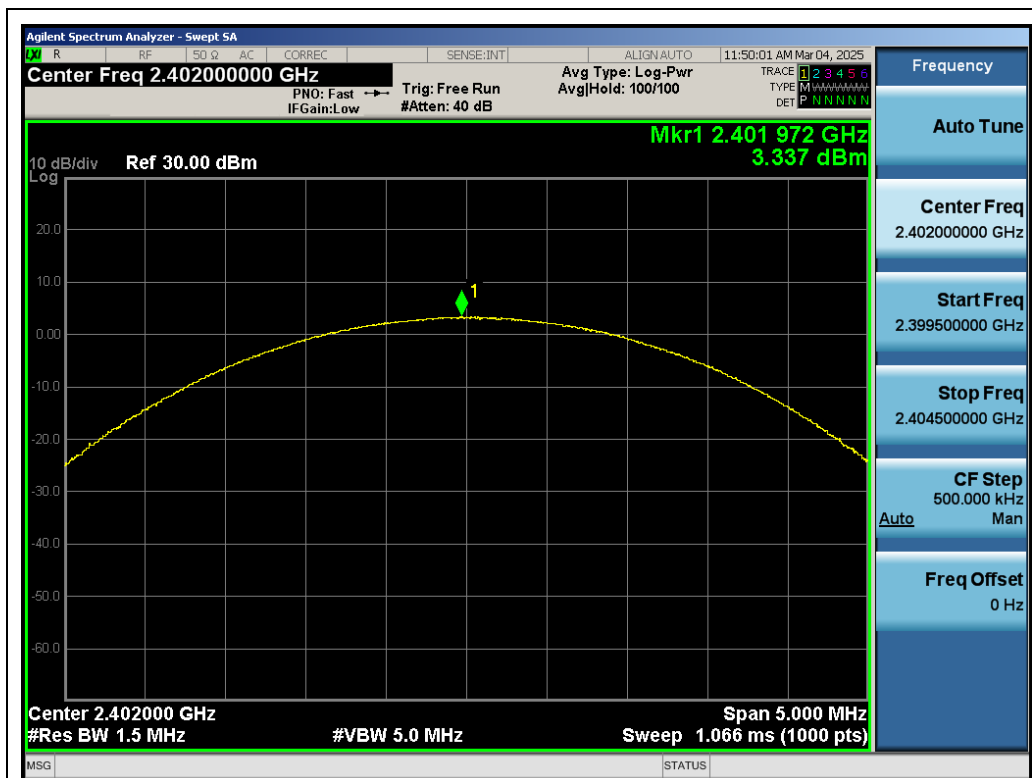
Test_Graph_EDR_ANT1_2402_2Mbps_Peak Power



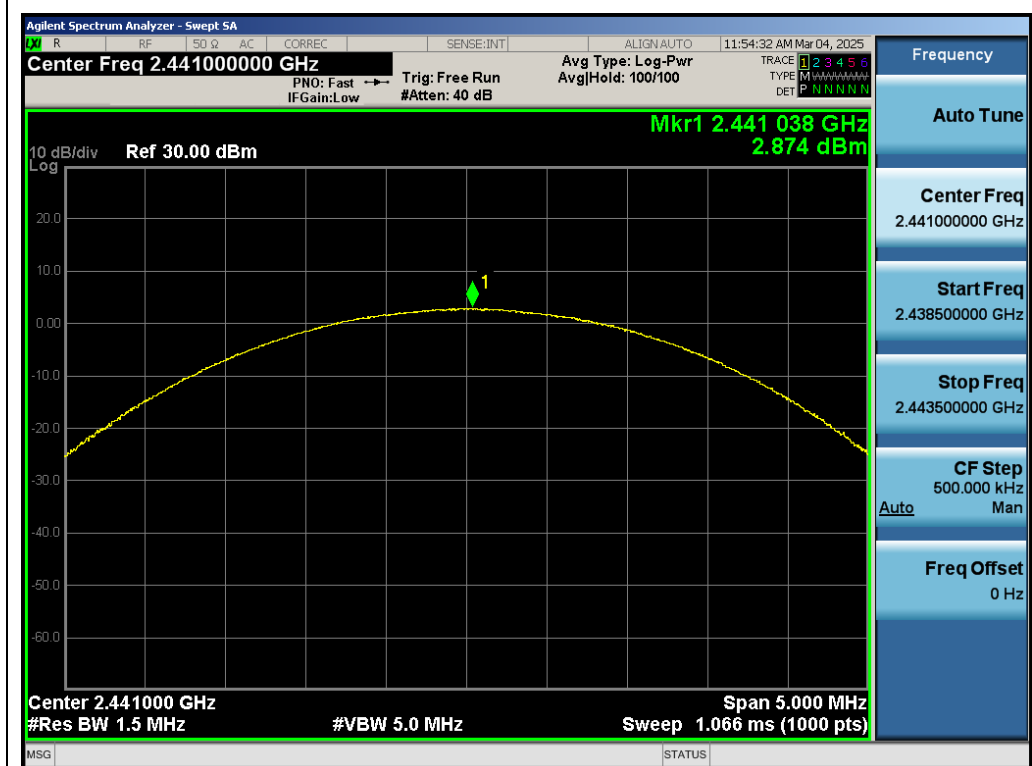
Test_Graph_EDR_ANT1_2441_2Mbps_Peak Power



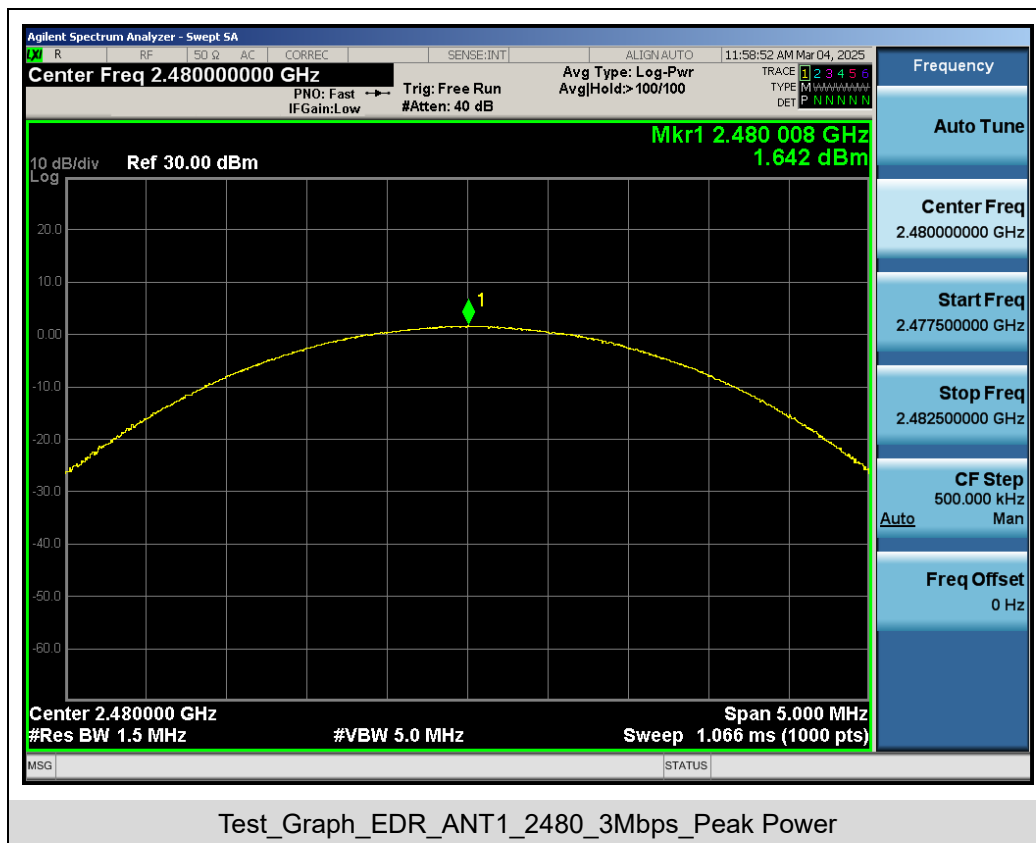
Test_Graph_EDR_ANT1_2480_2Mbps_Peak Power



Test_Graph_EDR_ANT1_2402_3Mbps_Peak Power



Test_Graph_EDR_ANT1_2441_3Mbps_Peak Power



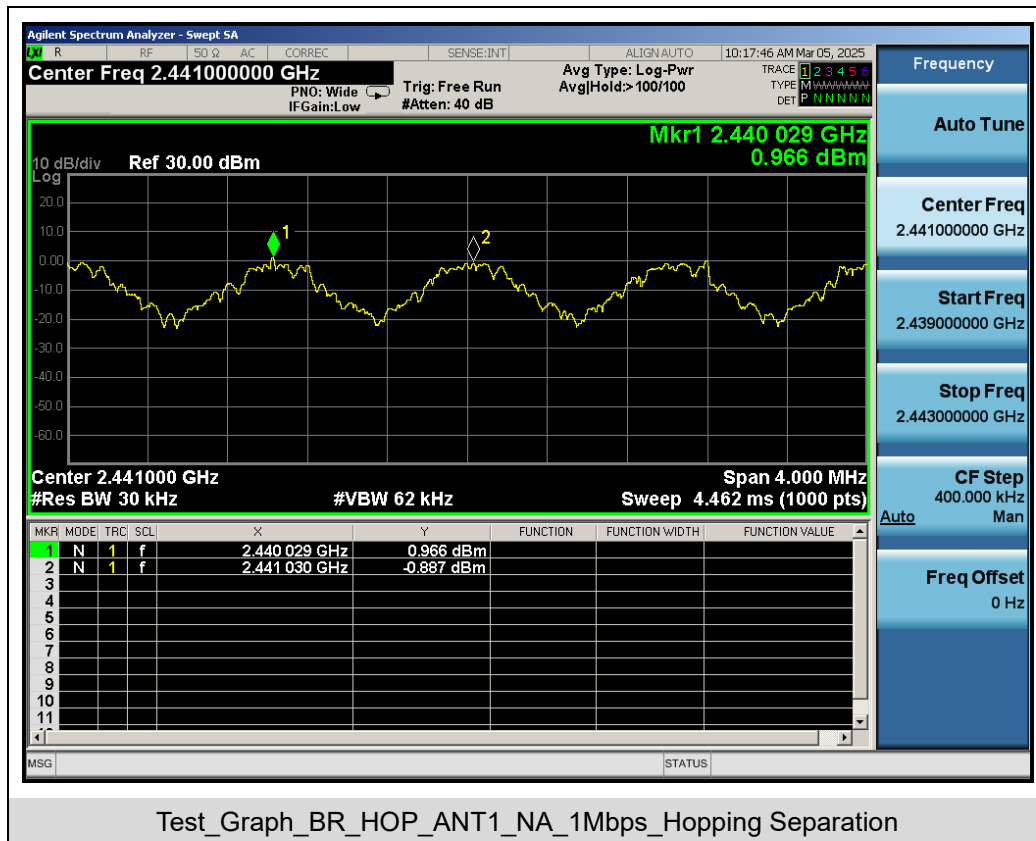
Appendix C: Carrier frequency separation

Test Result

Test Mode	Channel Separation (MHz)	Limits (MHz)	Pass or Fail
GFSK	1.001	0.873333	Pass

Remark:For this test item, only the DH5 rate mode corresponding to the maximum power GFSK modulation is recorded.

Test Graphs

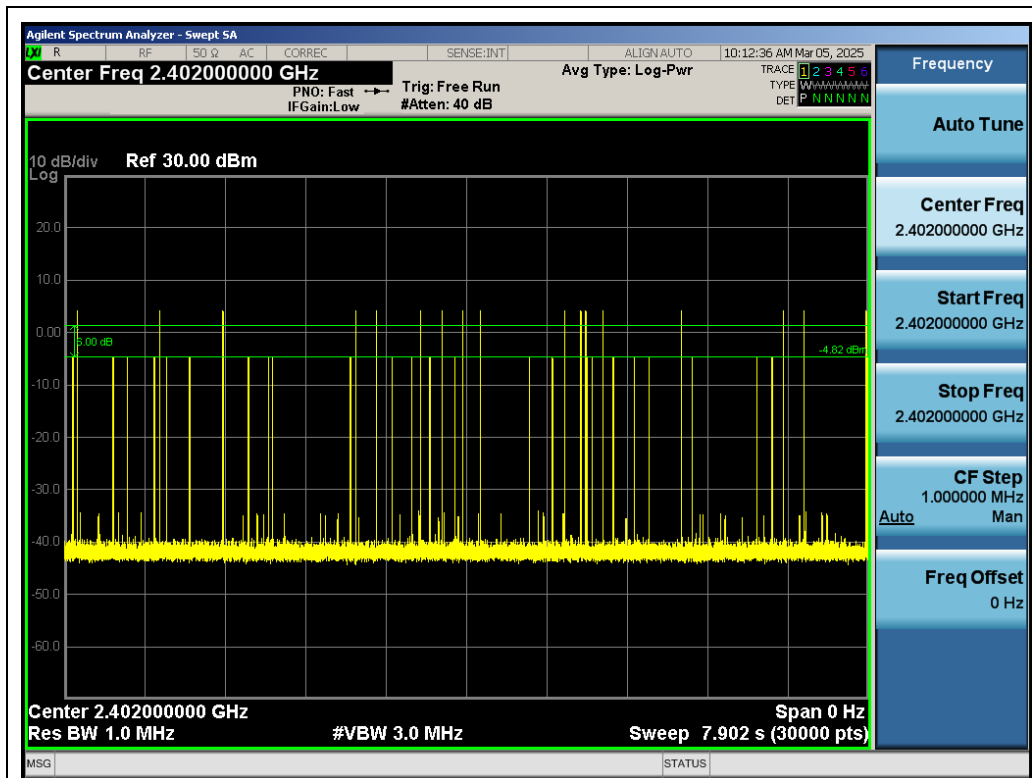


Appendix D: Time of occupancy

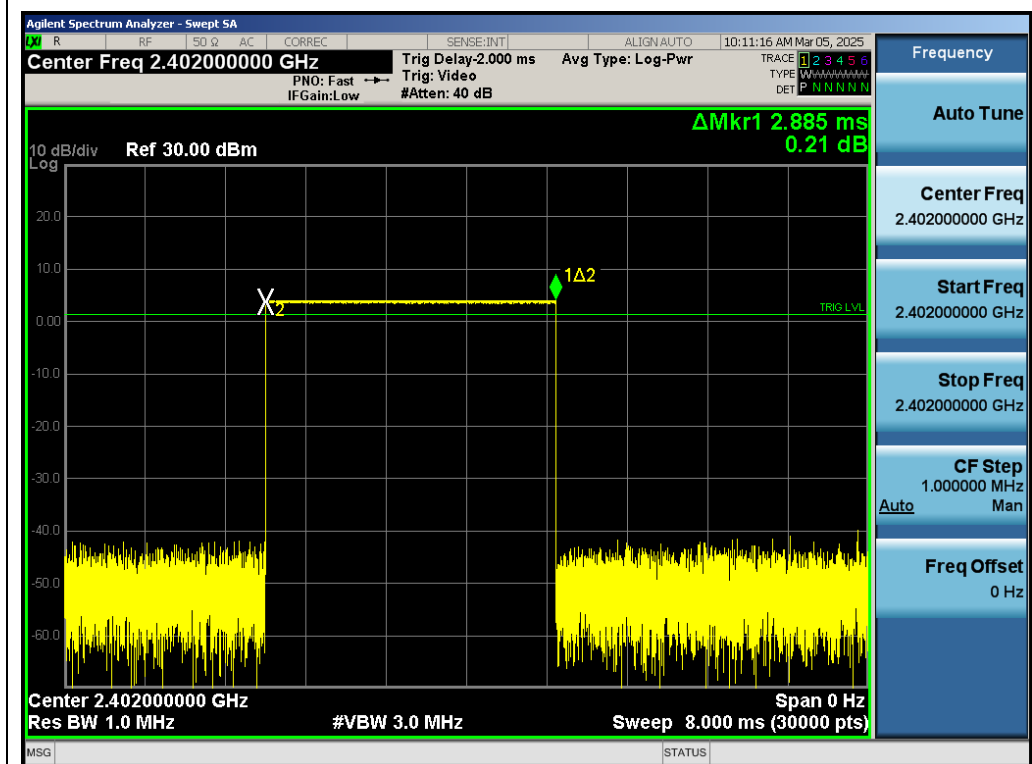
Test Result

Channel	Time of Pulse for DH5 (ms)	Number of hops in the period specified in the requirements	Dwell Time (ms)	Limit (ms)	Pass or Fail
2402	2.885	17.0*4	196.180	400	Pass
2441	2.885	26.0*4	300.040	400	Pass
2480	2.885	33.0*4	380.820	400	Pass

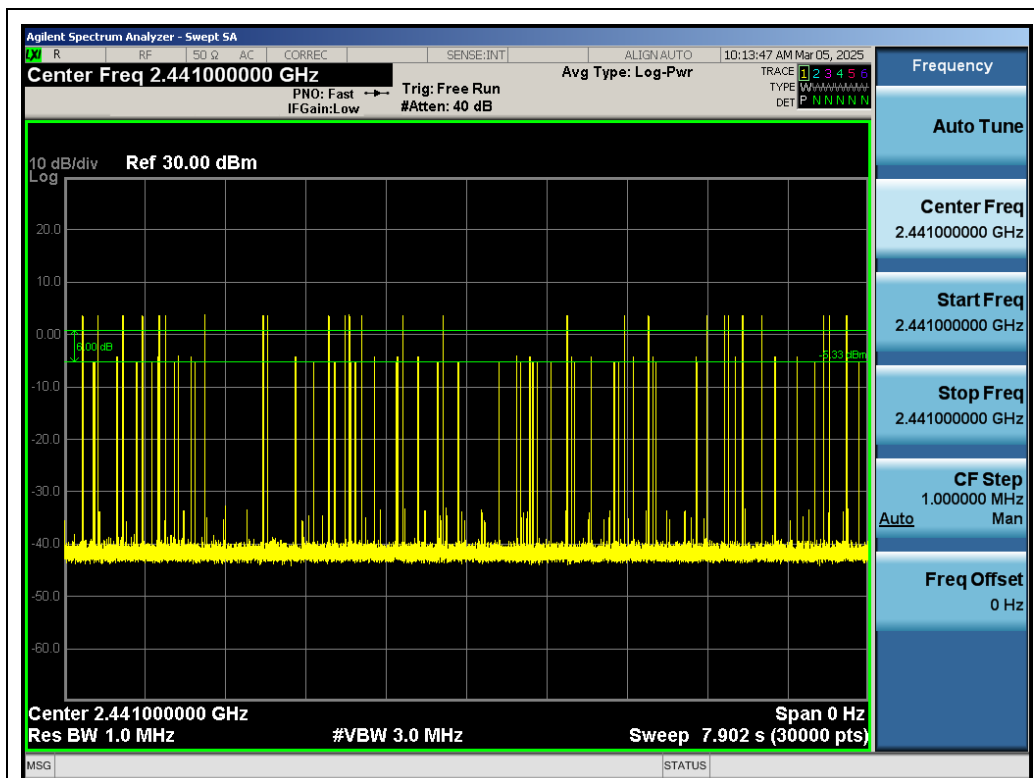
Test Graphs



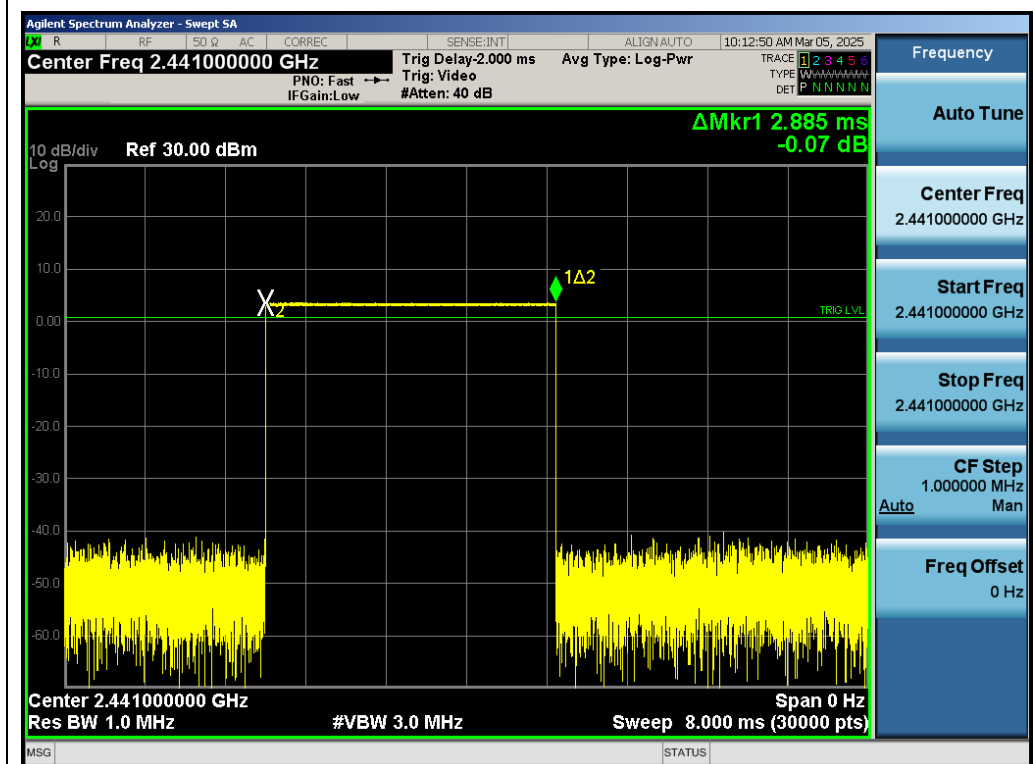
Test_Graph_BR_HOP_ANT1_NA_1Mbps_2402_Number of Burst



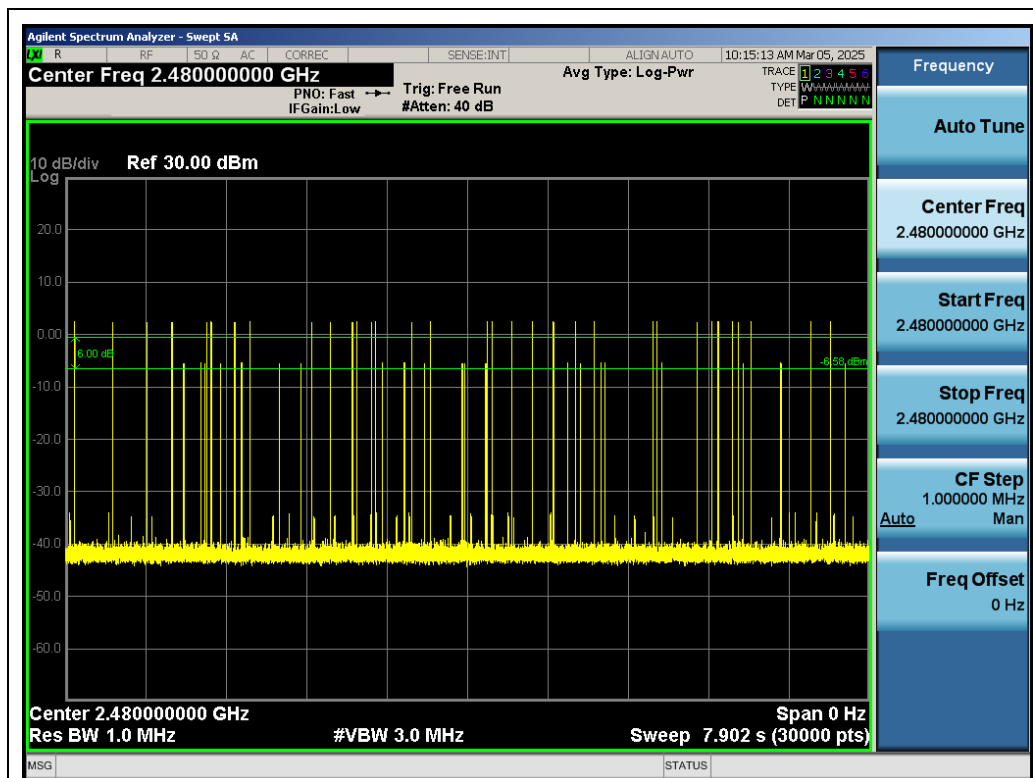
Test_Graph_BR_HOP_ANT1_NA_1Mbps_2402_Time per Burst



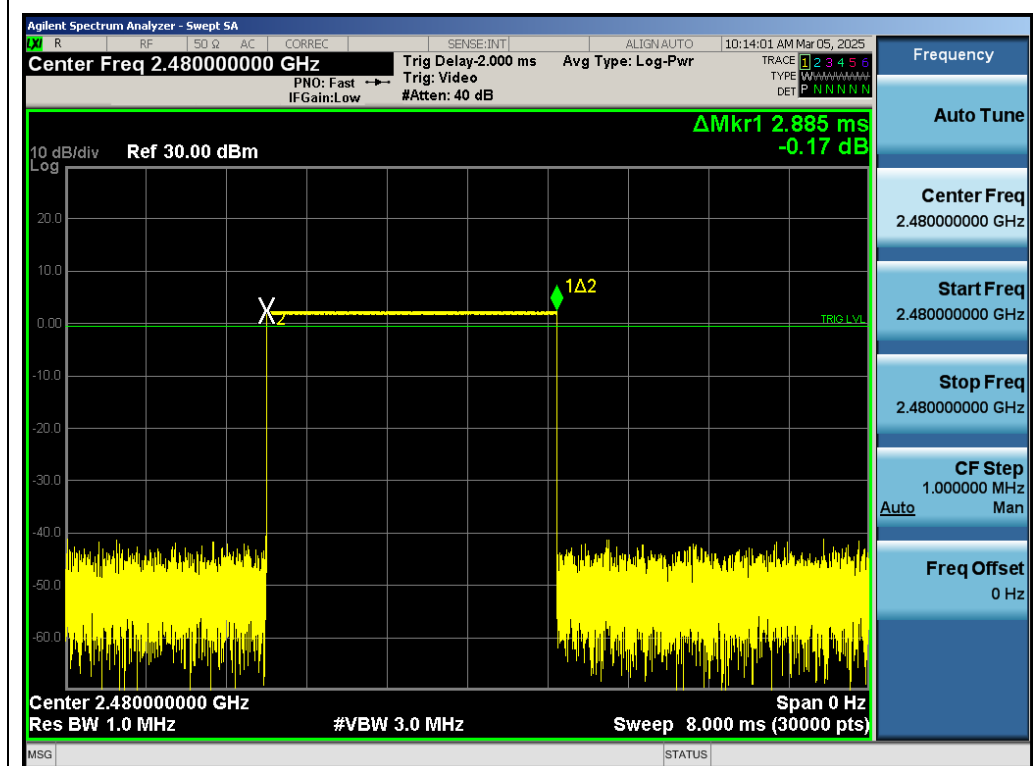
Test_Graph_BR_HOP_ANT1_NA_1Mbps_2441_Number of Burst



Test_Graph_BR_HOP_ANT1_NA_1Mbps_2441_Time per Burst



Test_Graph_BR_HOP_ANT1_NA_1Mbps_2480_Number of Burst



Test_Graph_BR_HOP_ANT1_NA_1Mbps_2480_Time per Burst

Note: All mode rates are tested and evaluated, GFSK modulated DH5 mode is the worst case and documented in the report.

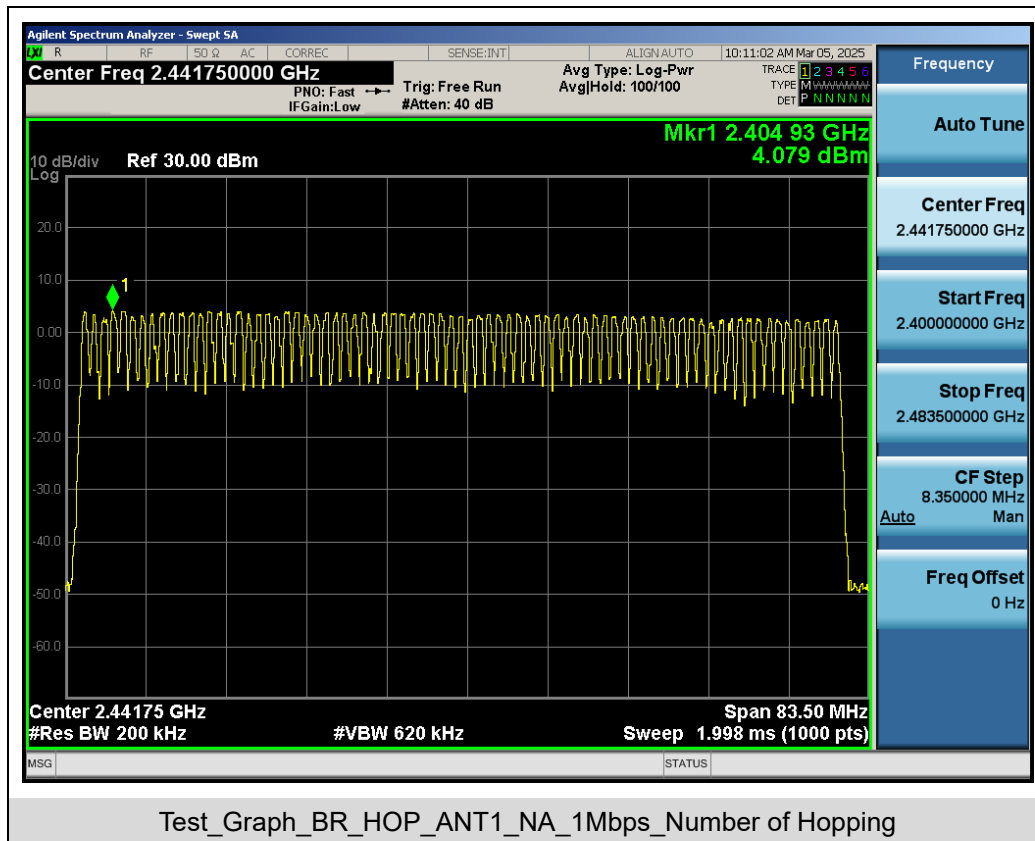
Appendix E: Number of hopping channels

Test Result

Test Mode	Number of Hopping Frequency	Limits	Pass or Fail
GFSK Hopping	79	≥ 15	Pass

Remark:For this test item, only the DH5 rate mode corresponding to the maximum power GFSK modulation is recorded.

Test Graphs

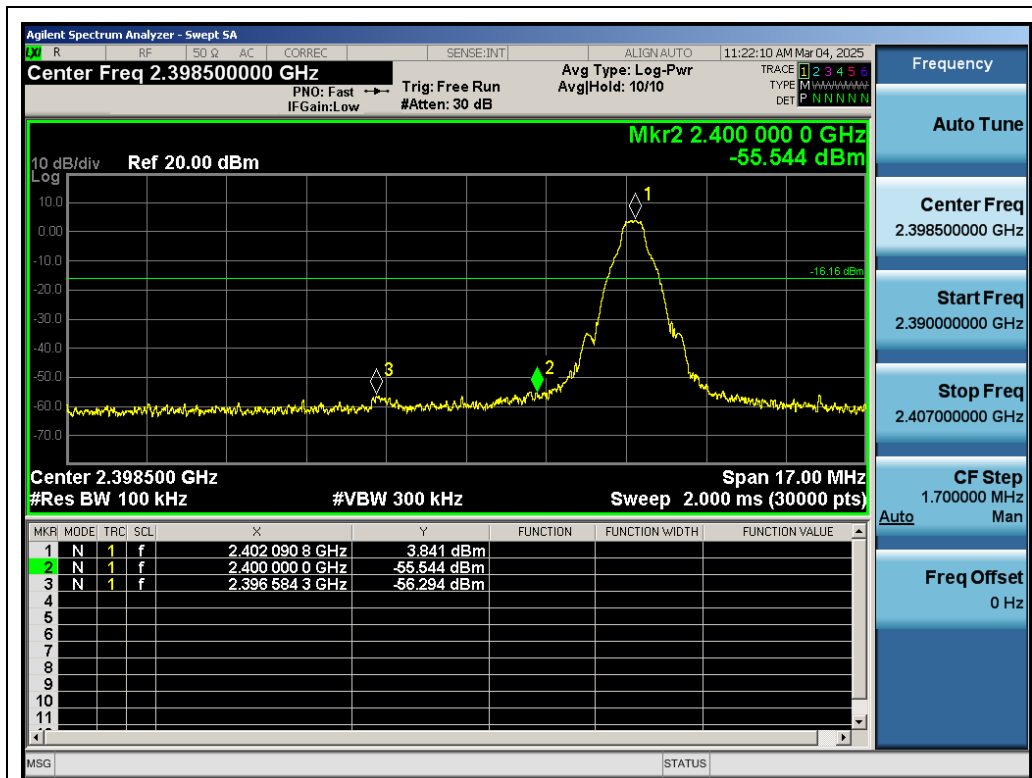


Appendix F: Band edge measurements

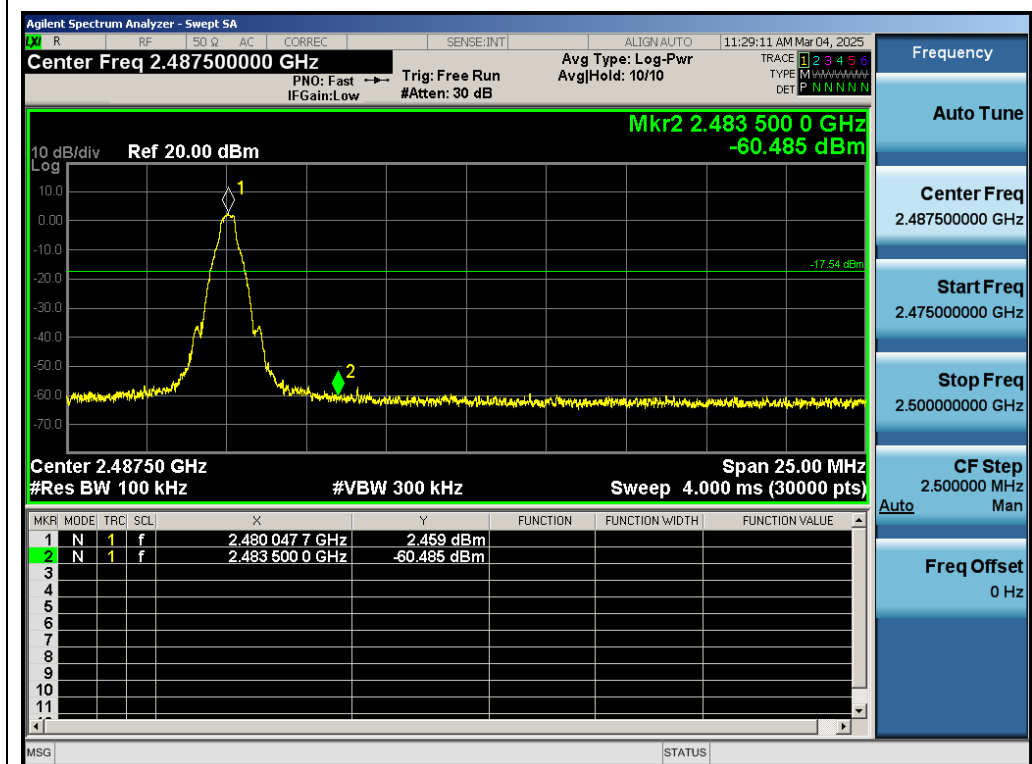
Test Result

Test Mode	Ch.Name	Frequency [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
GFSK	Low	2402	3.841	-55.544	≤ -16.16	Pass
GFSK	High	2480	2.459	-60.485	≤ -17.54	Pass
GFSK	Low	Hop_2402	3.382	-60.081	≤ -16.62	Pass
GFSK	High	Hop_2480	2.089	-62.356	≤ -17.91	Pass
$\pi/4$ -DQPSK	Low	2402	1.410	-55.539	≤ -18.59	Pass
$\pi/4$ -DQPSK	High	2480	-0.395	-61.840	≤ -20.40	Pass
$\pi/4$ -DQPSK	Low	Hop_2402	1.510	-61.535	≤ -18.49	Pass
$\pi/4$ -DQPSK	High	Hop_2480	-0.989	-61.583	≤ -20.99	Pass
8DPSK	Low	2402	0.921	-57.202	≤ -19.08	Pass
8DPSK	High	2480	-0.314	-60.836	≤ -20.31	Pass
8DPSK	Low	Hop_2402	-0.511	-60.088	≤ -20.51	Pass
8DPSK	High	Hop_2480	-0.048	-60.268	≤ -20.05	Pass

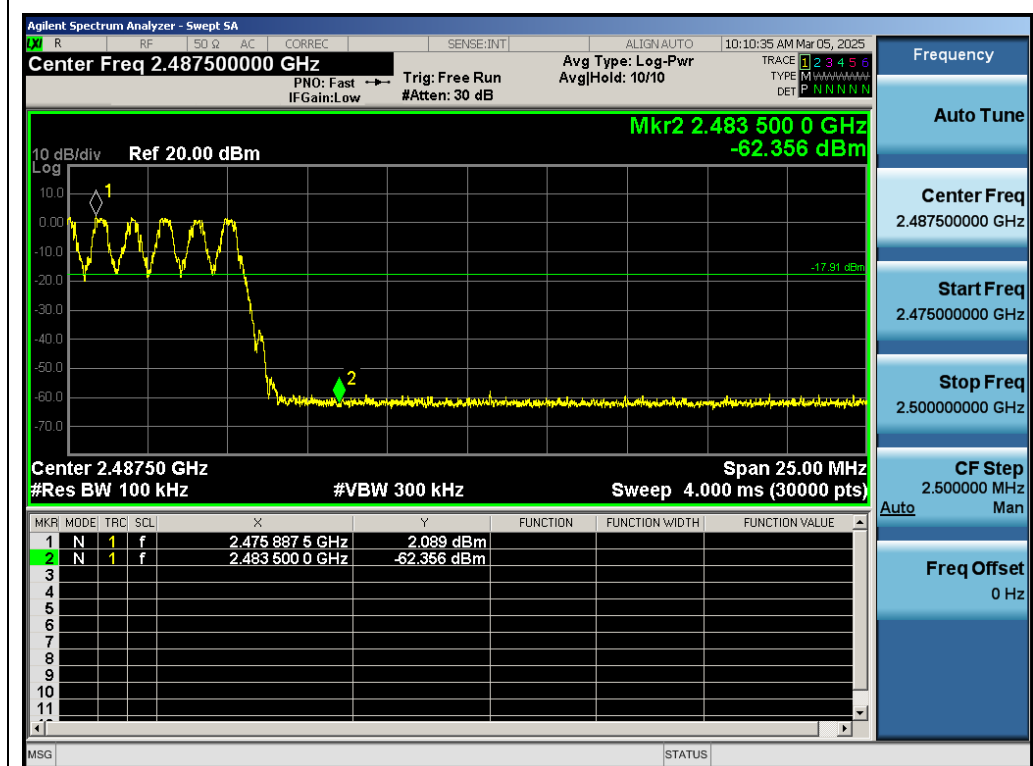
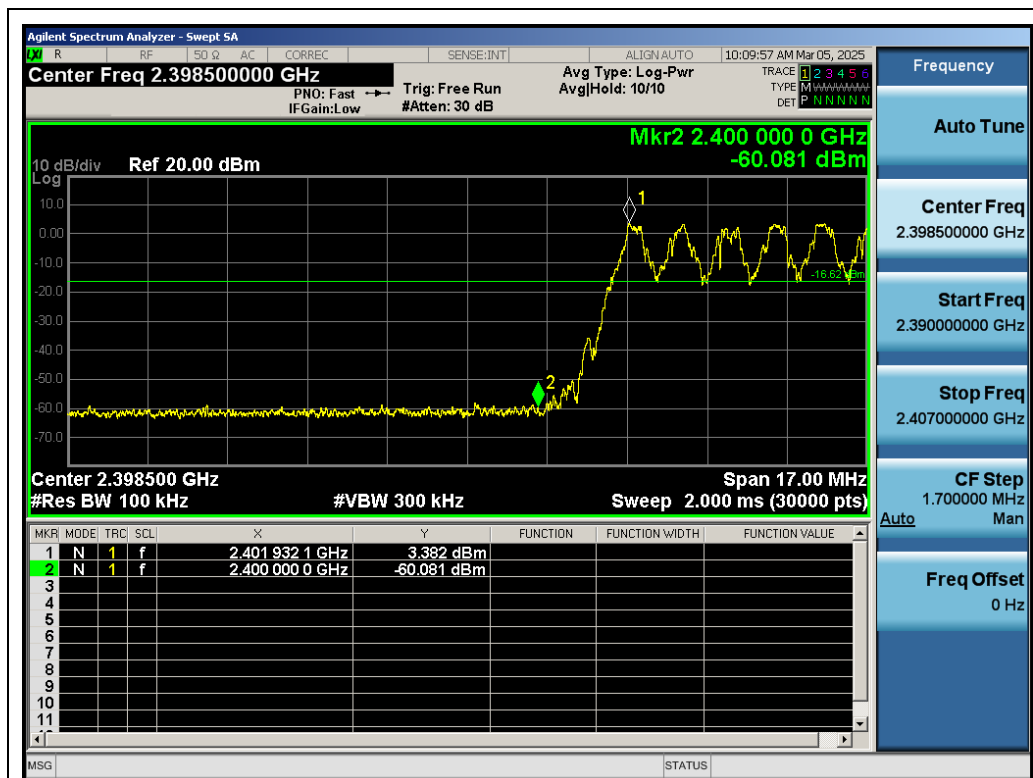
Test Graphs

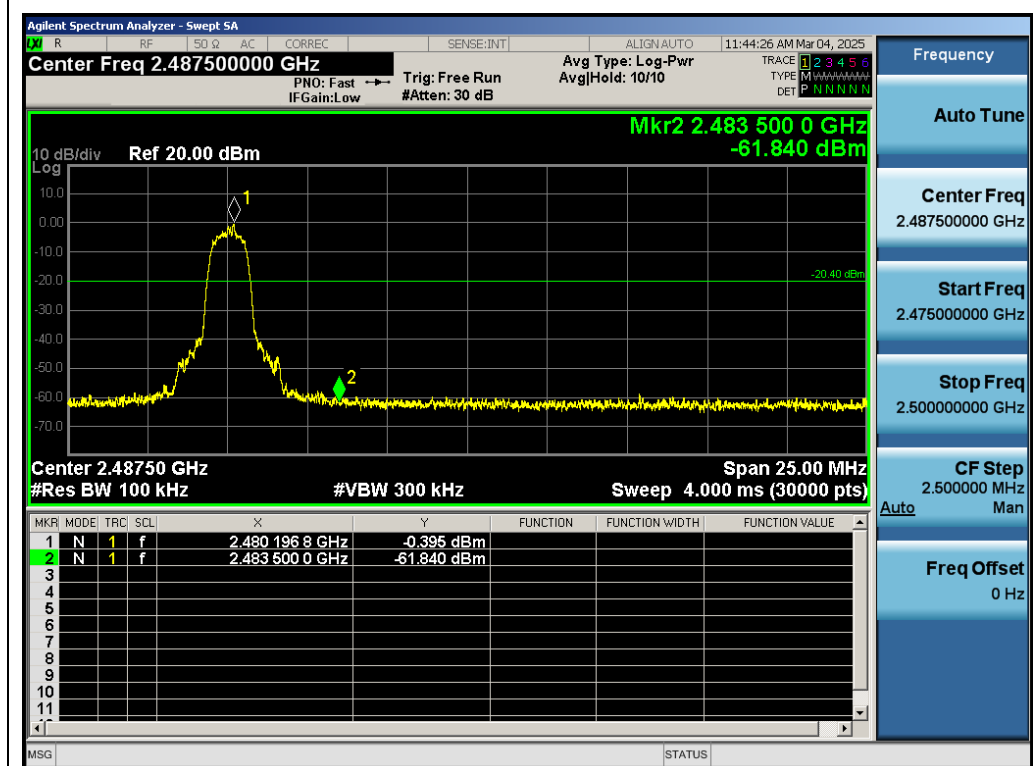
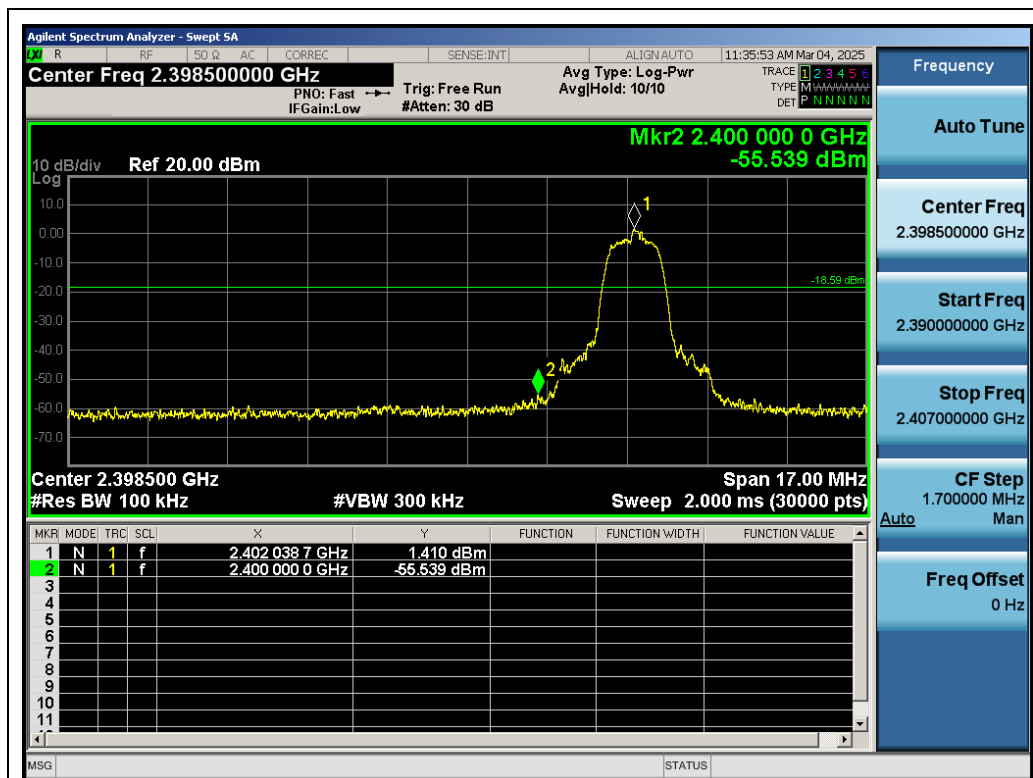


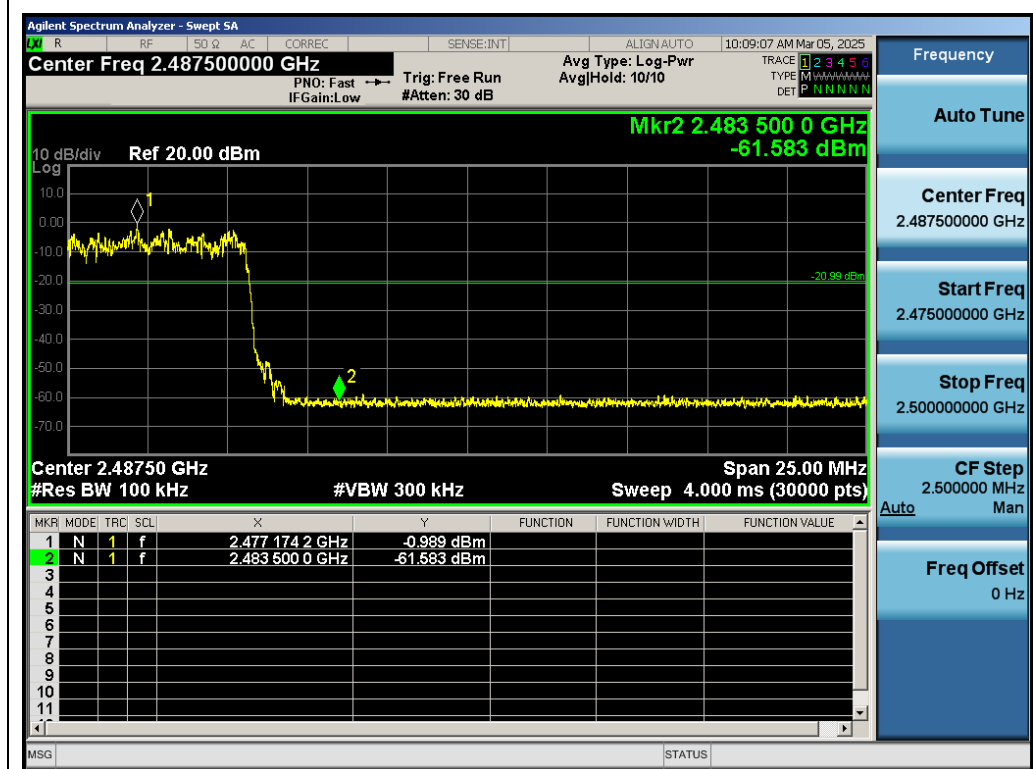
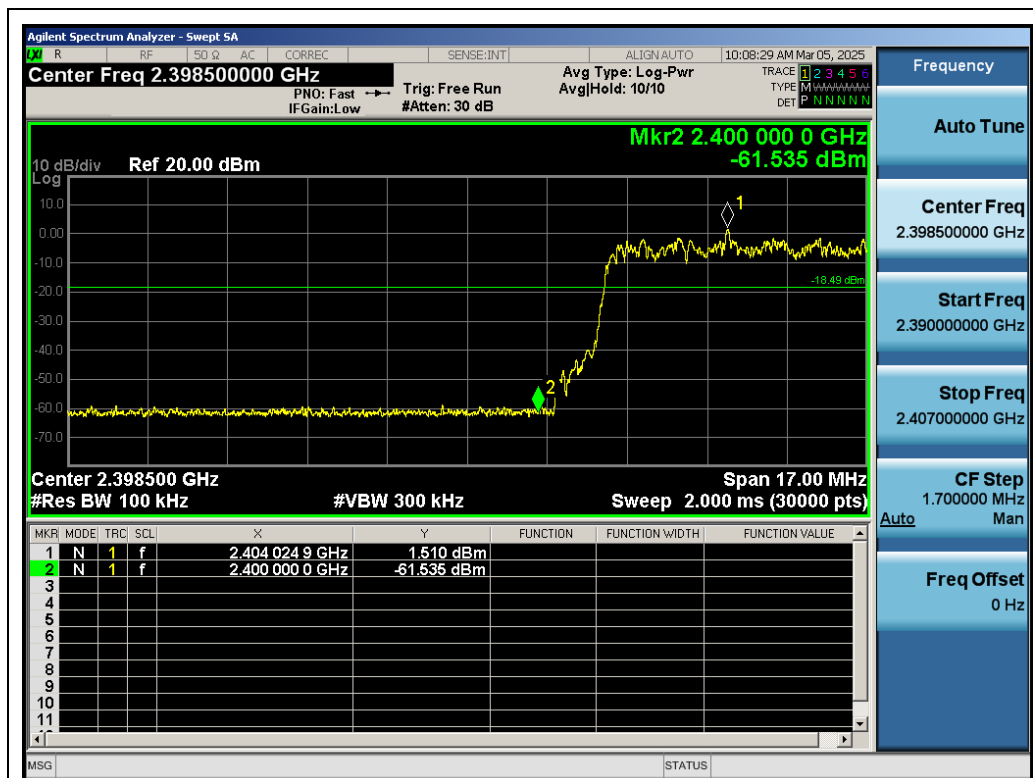
Test_Graph_BR_ANT1_2402_1Mbps_Lower Band Edge Emissions

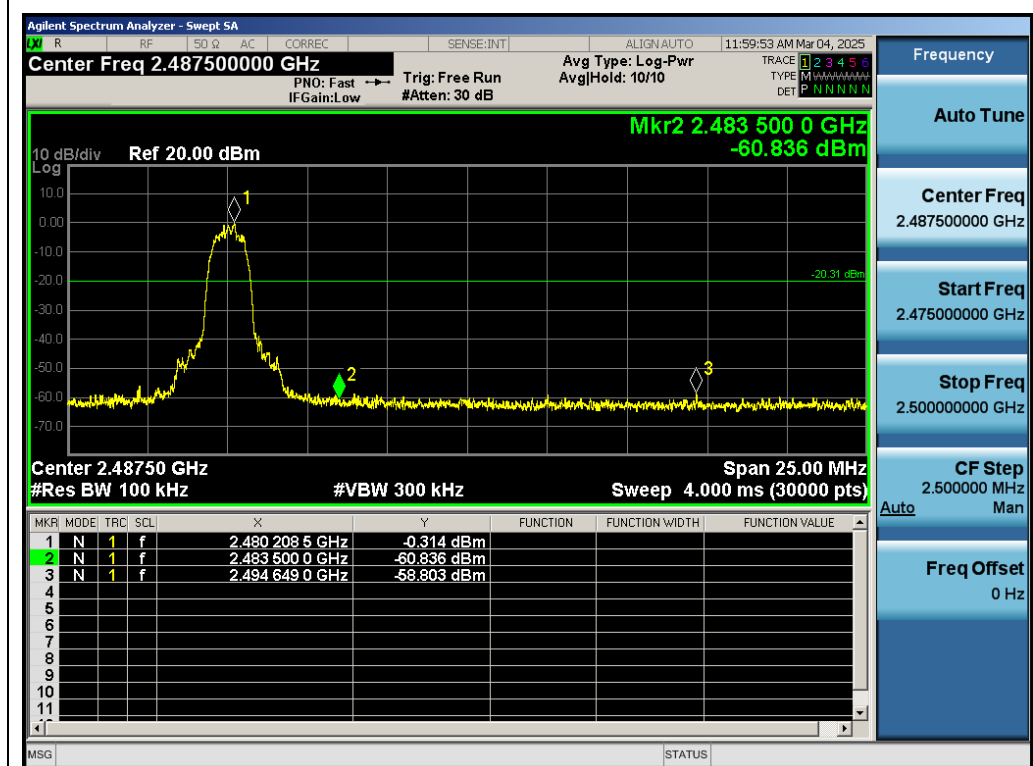
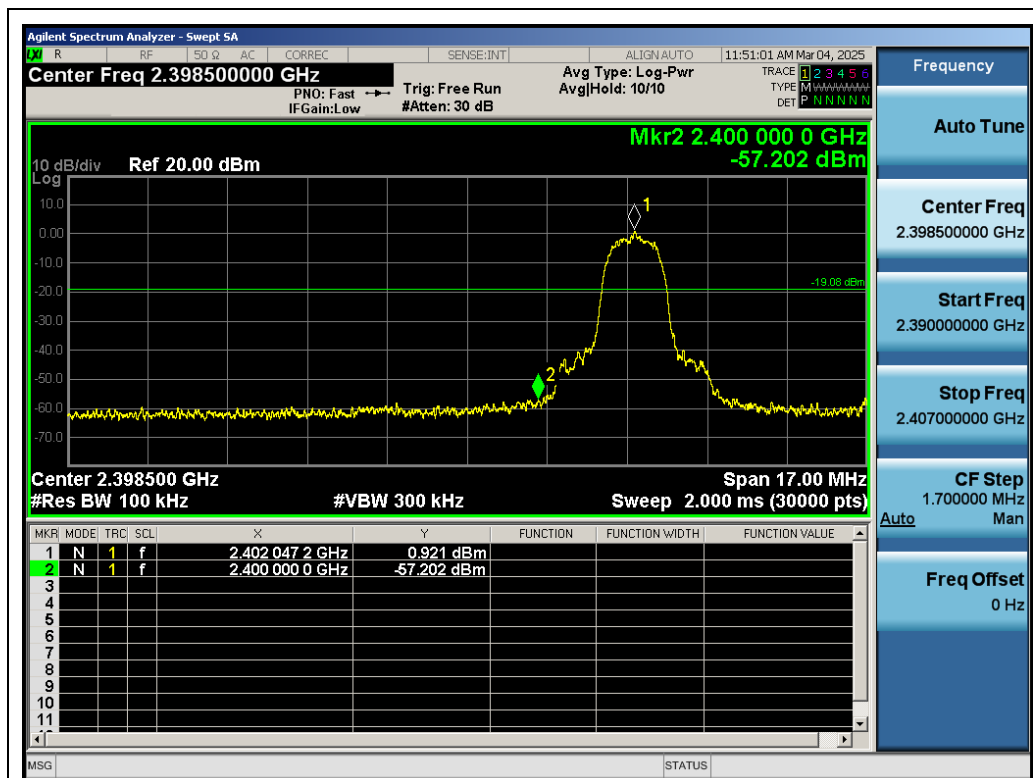


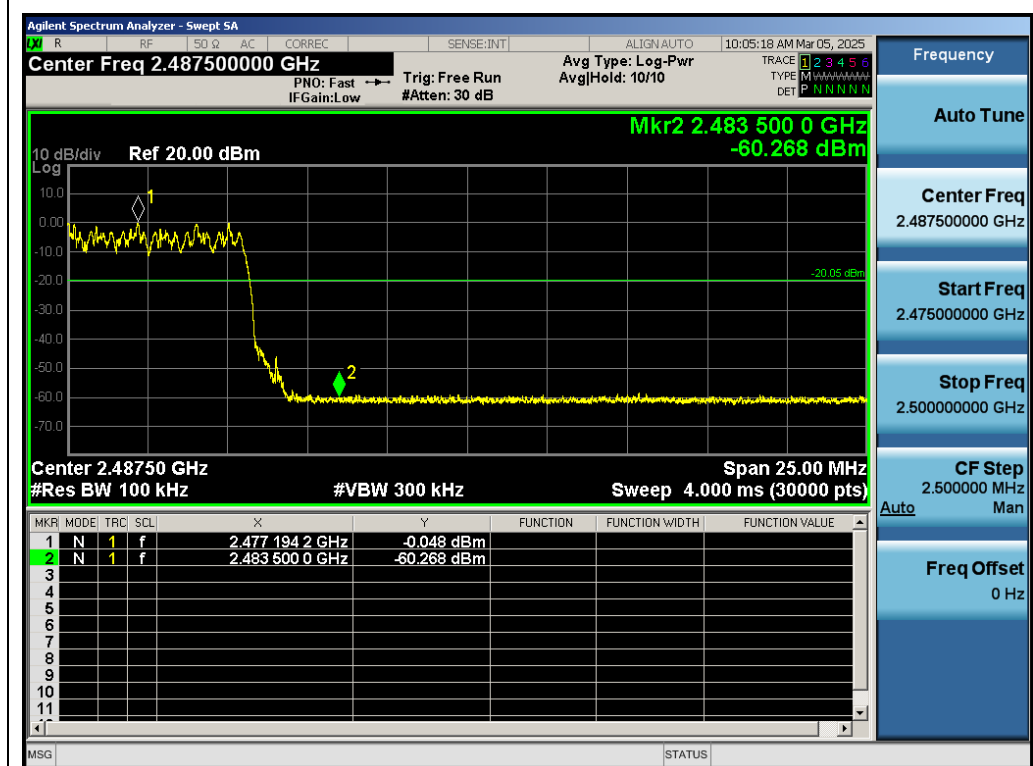
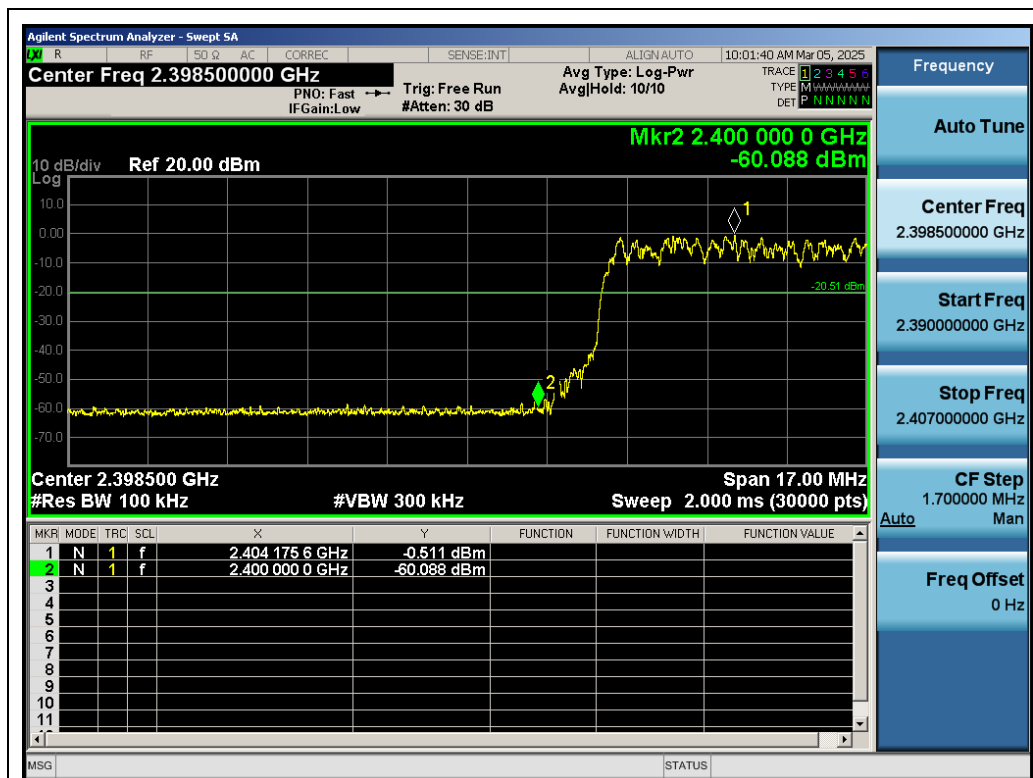
Test_Graph_BR_ANT1_2480_1Mbps_Higher Band Edge Emissions









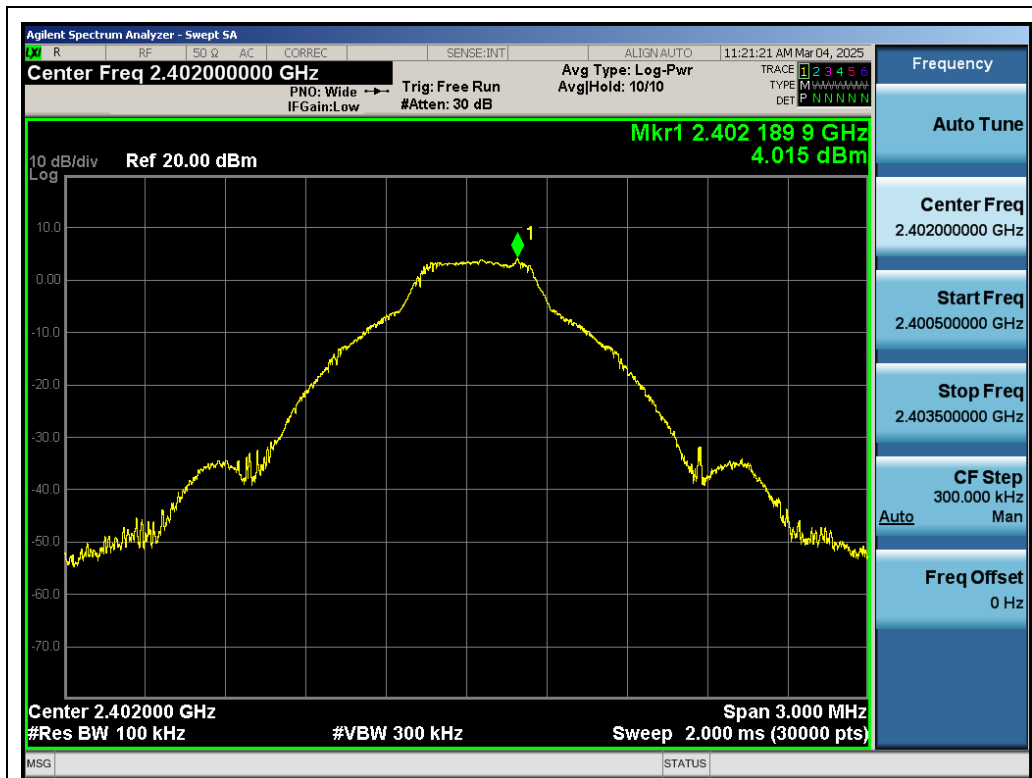


Appendix G: Conducted Spurious Emission

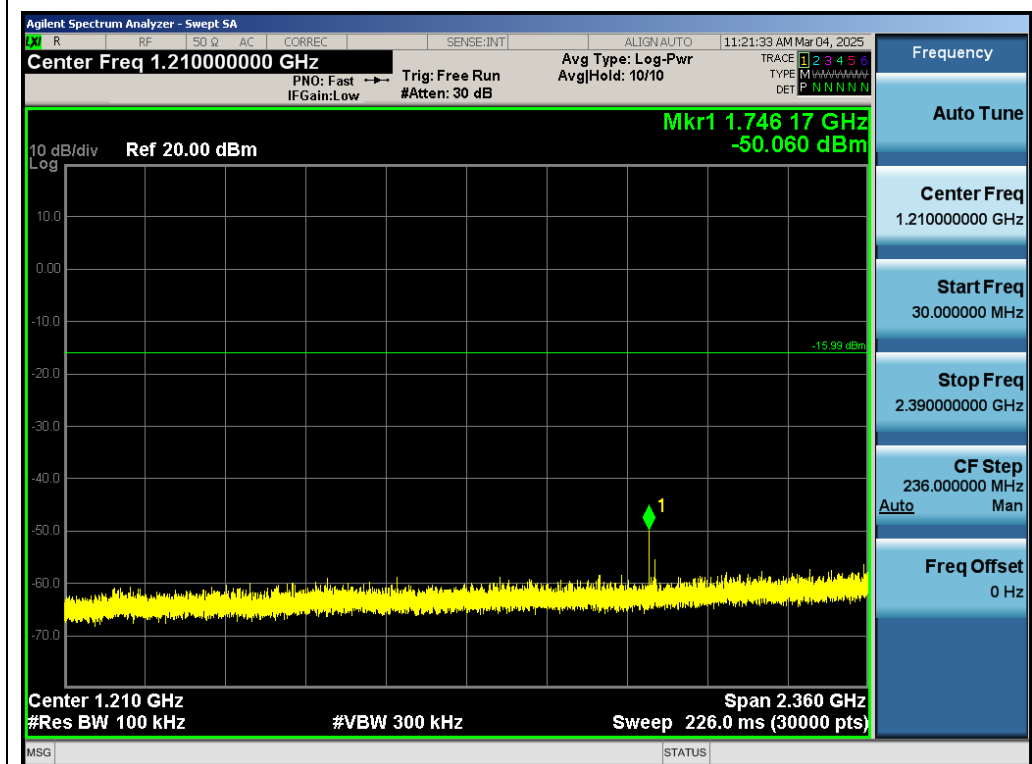
Test Result

Test Mode	Frequency [MHz]	Freq. Range [MHz]	Ref. Level [dBm]	Result [dBm]	Limit [dBm]	Verdict
GFSK	2402	0~Reference	4.015	4.015	---	PASS
GFSK	2402	30~2390	4.015	-50.060	≤-15.99	PASS
GFSK	2402	2483.5~25000	4.015	-48.843	≤-15.99	PASS
GFSK	2441	0~Reference	3.701	3.701	---	PASS
GFSK	2441	30~2400	3.701	-57.095	≤-16.30	PASS
GFSK	2441	2483.5~25000	3.701	-48.896	≤-16.30	PASS
GFSK	2480	0~Reference	2.402	2.402	---	PASS
GFSK	2480	30~2400	2.402	-54.104	≤-17.60	PASS
GFSK	2480	2500~25000	2.402	-48.879	≤-17.60	PASS
π /4-DQPSK	2402	0~Reference	1.509	1.509	---	PASS
π /4-DQPSK	2402	30~2390	1.509	-56.854	≤-18.49	PASS
π /4-DQPSK	2402	2483.5~25000	1.509	-48.627	≤-18.49	PASS
π /4-DQPSK	2441	0~Reference	0.754	0.754	---	PASS
π /4-DQPSK	2441	30~2400	0.754	-56.863	≤-19.25	PASS
π /4-DQPSK	2441	2483.5~25000	0.754	-48.072	≤-19.25	PASS
π /4-DQPSK	2480	0~Reference	-0.221	-0.221	---	PASS
π /4-DQPSK	2480	30~2400	-0.221	-56.926	≤-20.22	PASS
π /4-DQPSK	2480	2500~25000	-0.221	-49.265	≤-20.22	PASS
8DPSK	2402	0~Reference	1.386	1.386	---	PASS
8DPSK	2402	30~2390	1.386	-56.899	≤-18.61	PASS
8DPSK	2402	2483.5~25000	1.386	-48.646	≤-18.61	PASS
8DPSK	2441	0~Reference	0.832	0.832	---	PASS
8DPSK	2441	30~2400	0.832	-56.367	≤-19.17	PASS
8DPSK	2441	2483.5~25000	0.832	-48.583	≤-19.17	PASS
8DPSK	2480	0~Reference	-0.254	-0.254	---	PASS
8DPSK	2480	30~2400	-0.254	-57.058	≤-20.25	PASS
8DPSK	2480	2500~25000	-0.254	-48.484	≤-20.25	PASS

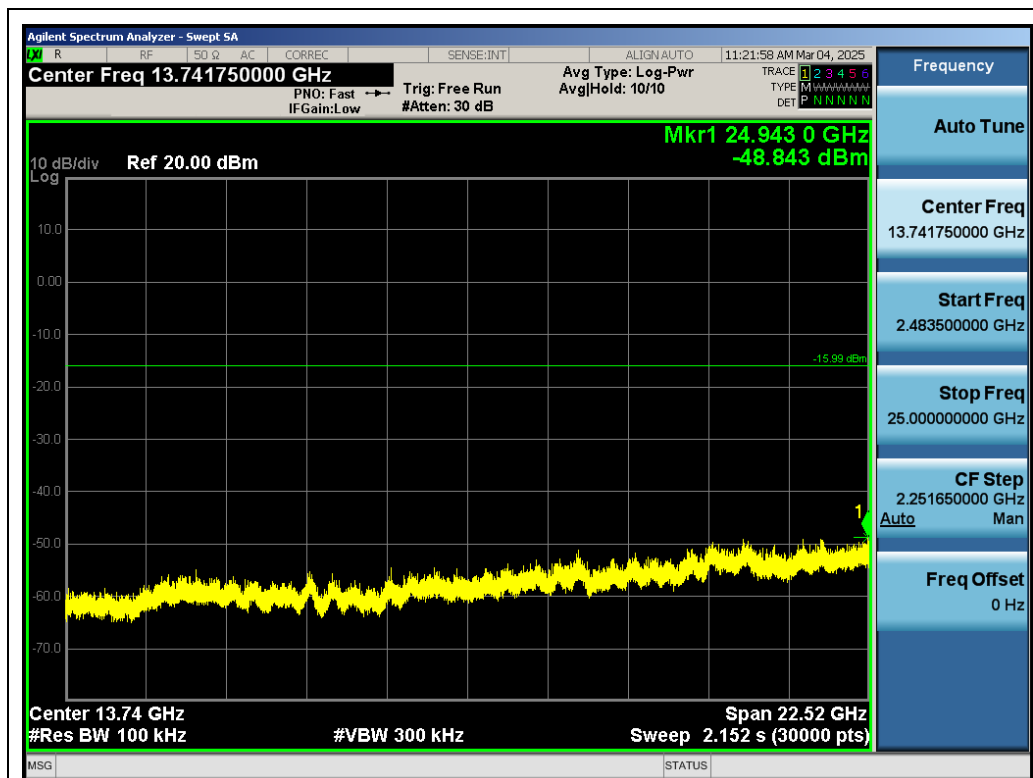
Test Graphs



Test_Graph_BR_ANT1_2402_1Mbps_Reference Level



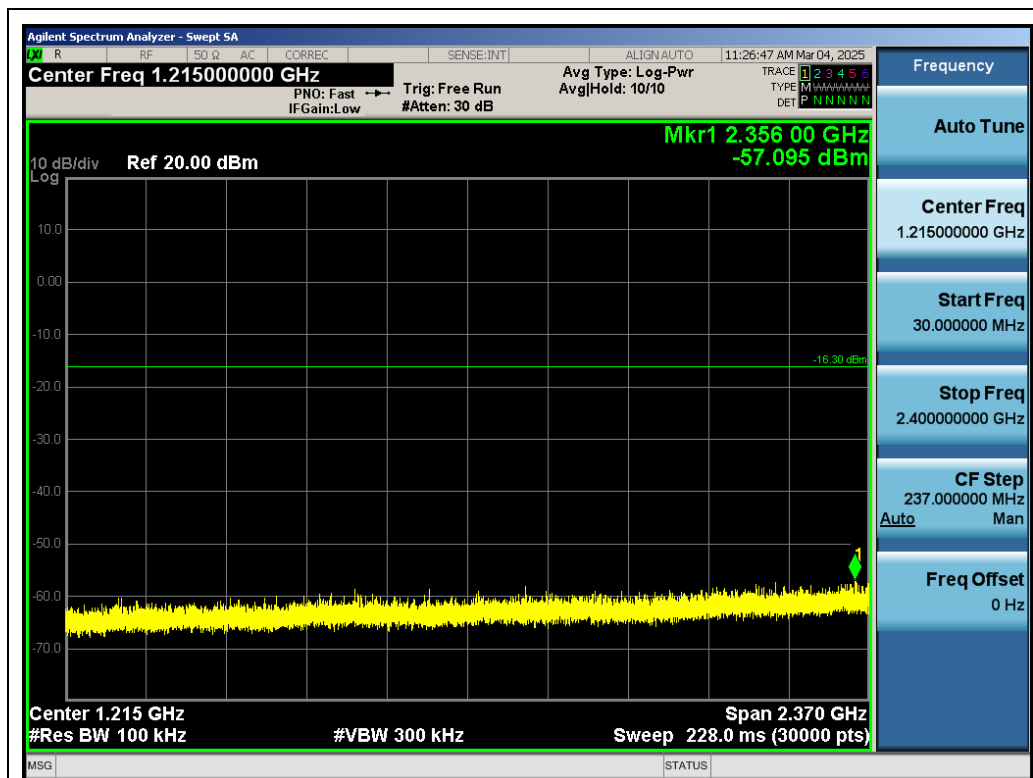
Test_Graph_BR_ANT1_2402_1Mbps_Lower Band Emissions



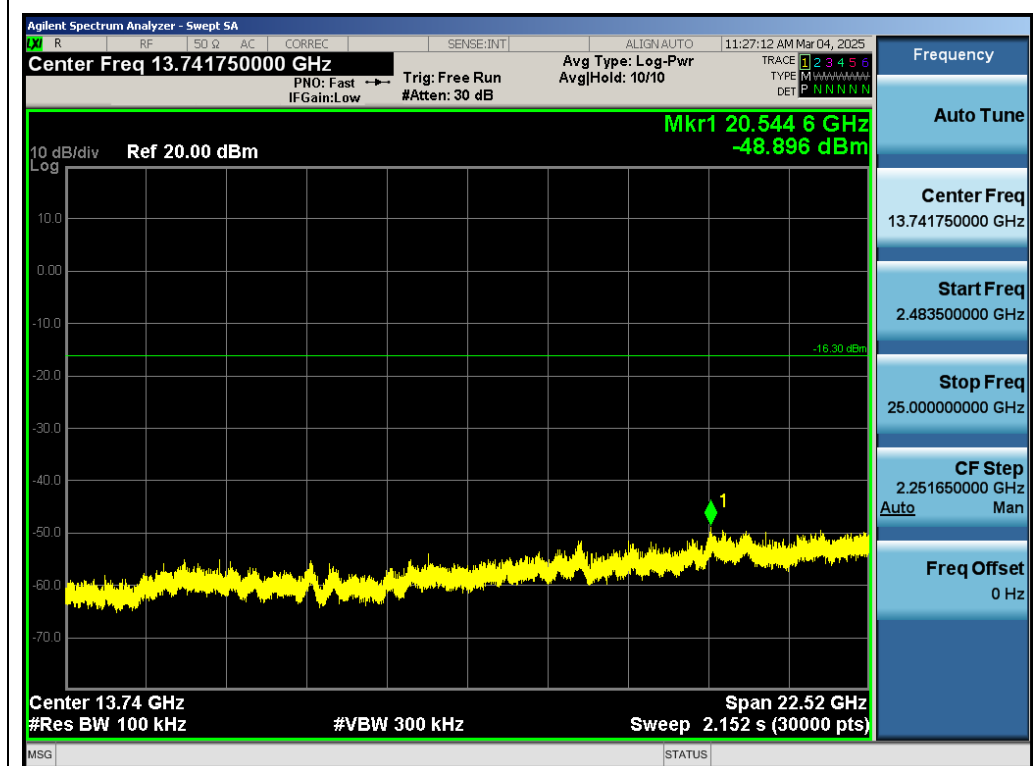
Test_Graph_BR_ANT1_2402_1Mbps_Higher Band Emissions



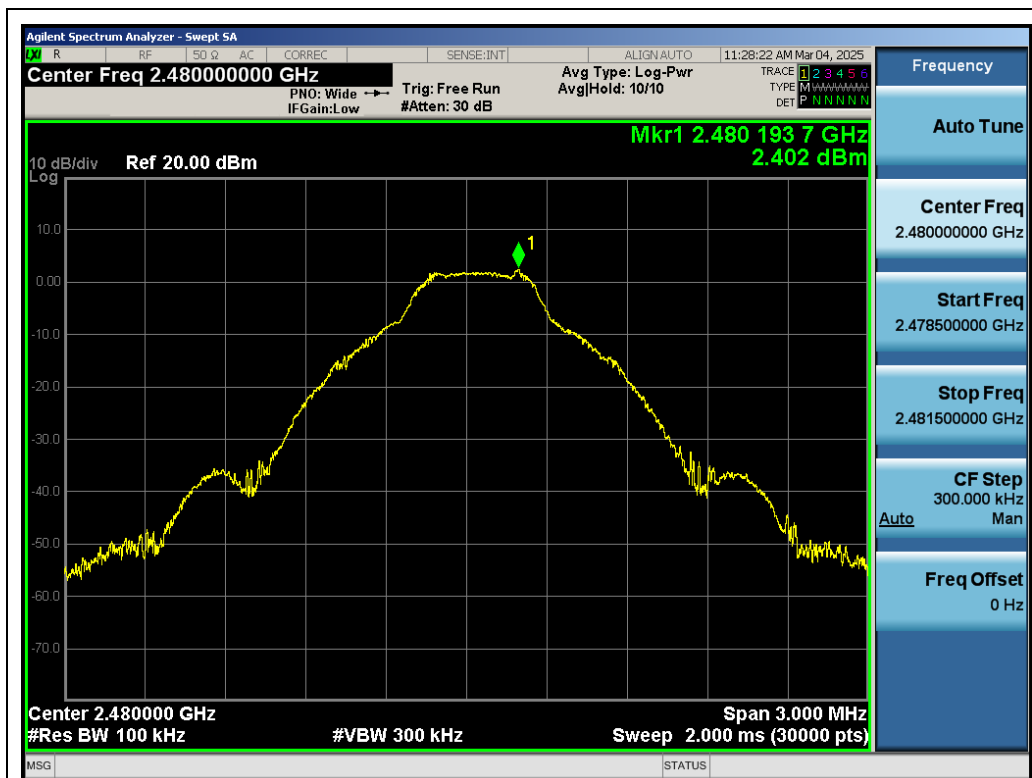
Test_Graph_BR_ANT1_2441_1Mbps_Reference Level



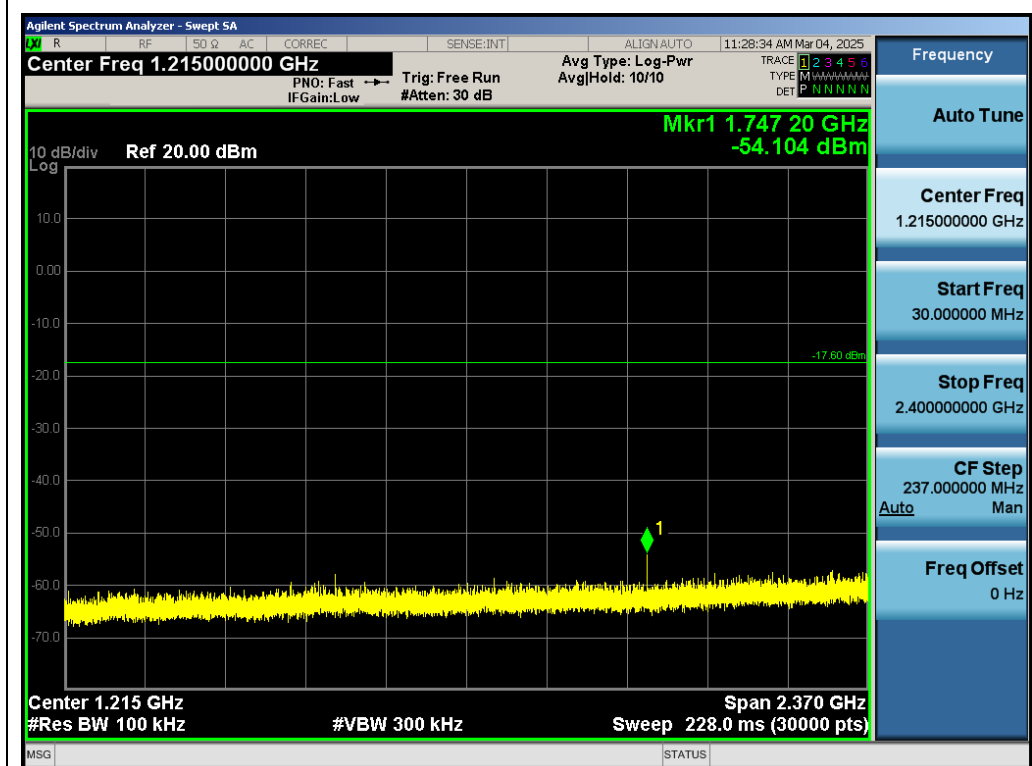
Test_Graph_BR_ANT1_2441_1Mbps_Lower Band Emissions



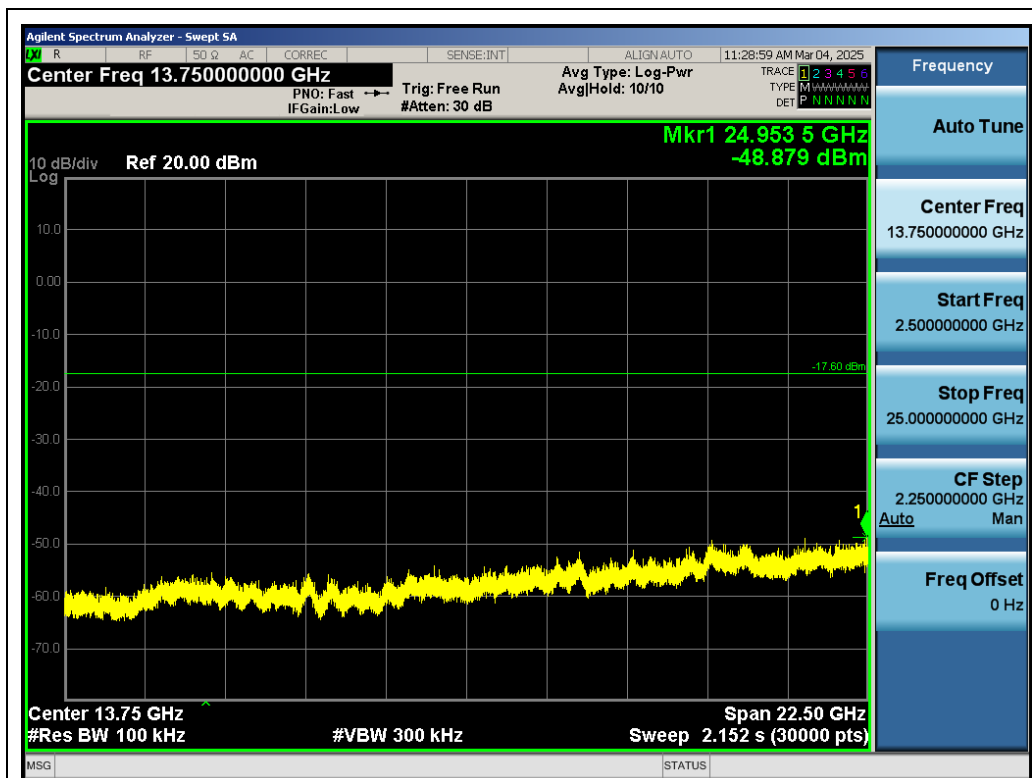
Test_Graph_BR_ANT1_2441_1Mbps_Higher Band Emissions



Test_Graph_BR_ANT1_2480_1Mbps_Reference Level



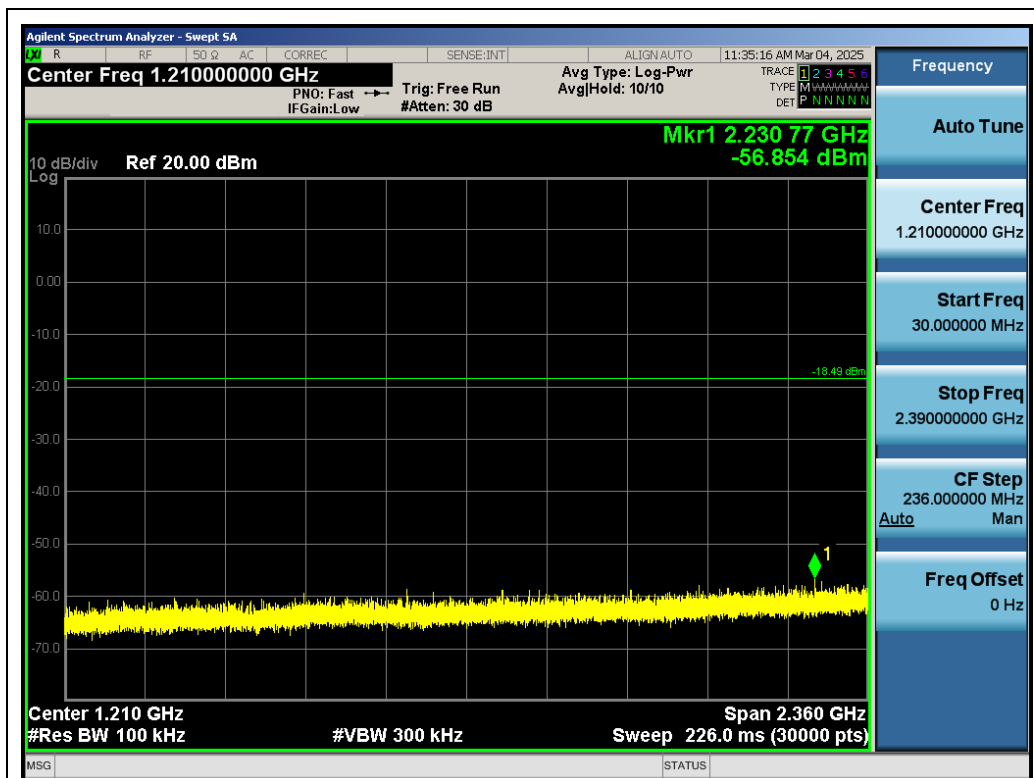
Test_Graph_BR_ANT1_2480_1Mbps_Lower Band Emissions



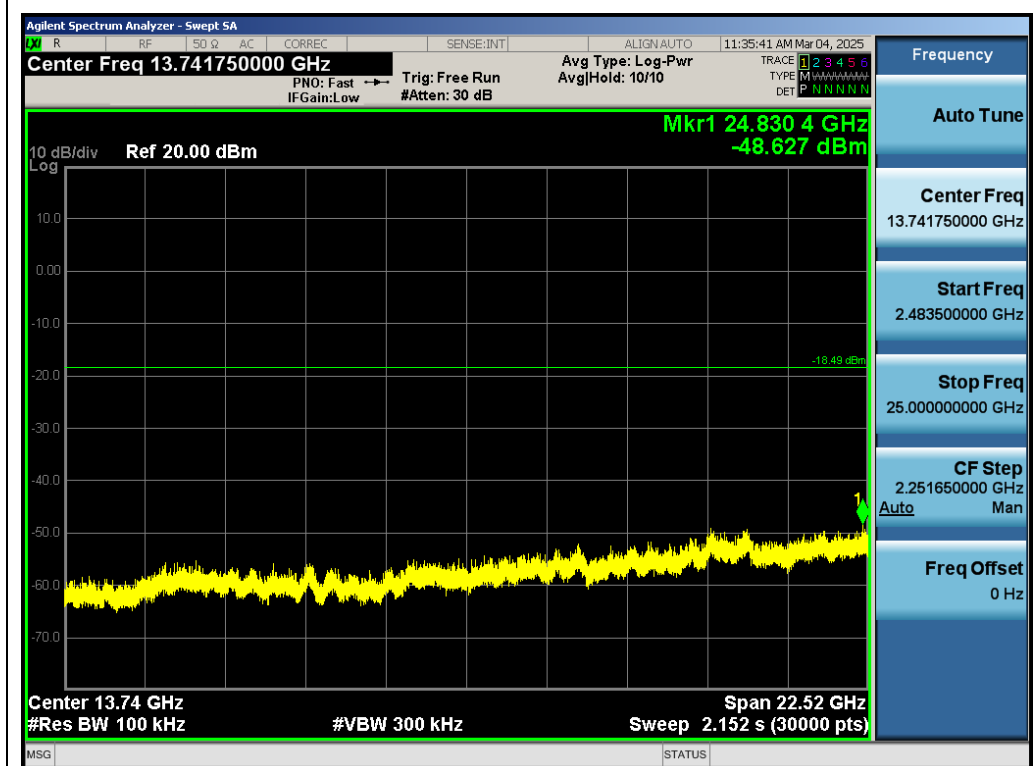
Test_Graph_BR_ANT1_2480_1Mbps_Higher Band Emissions



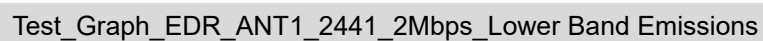
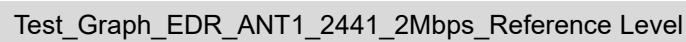
Test_Graph_EDR_ANT1_2402_2Mbps_Reference Level

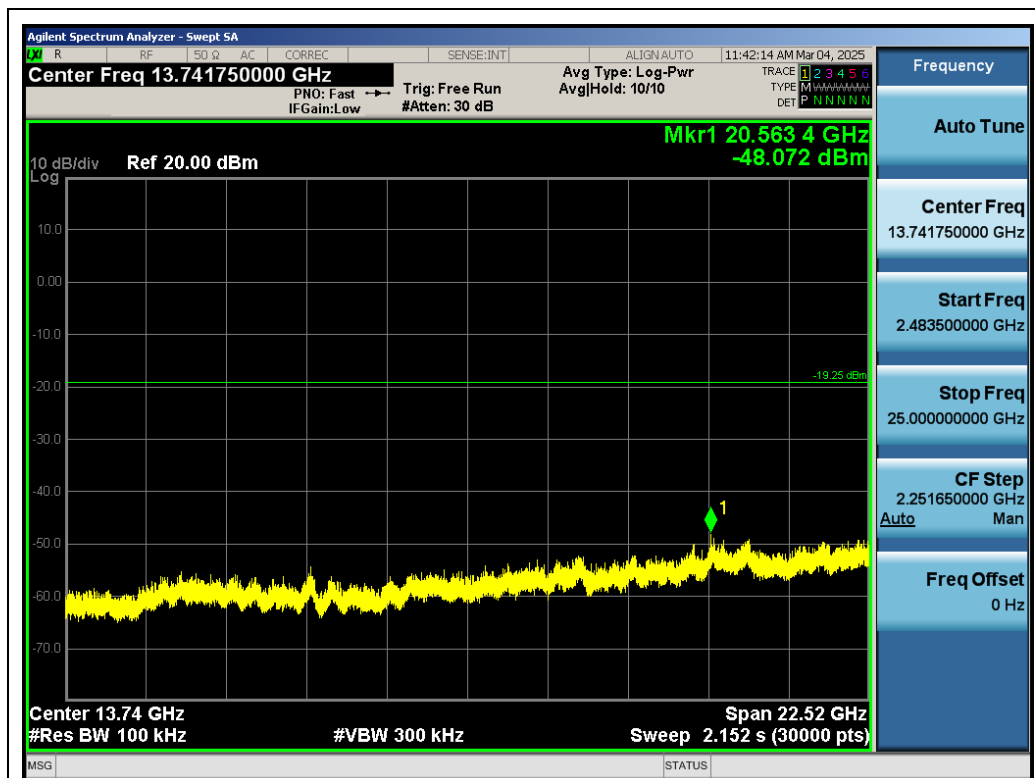


Test_Graph_EDR_ANT1_2402_2Mbps_Lower Band Emissions



Test_Graph_EDR_ANT1_2402_2Mbps_Higher Band Emissions

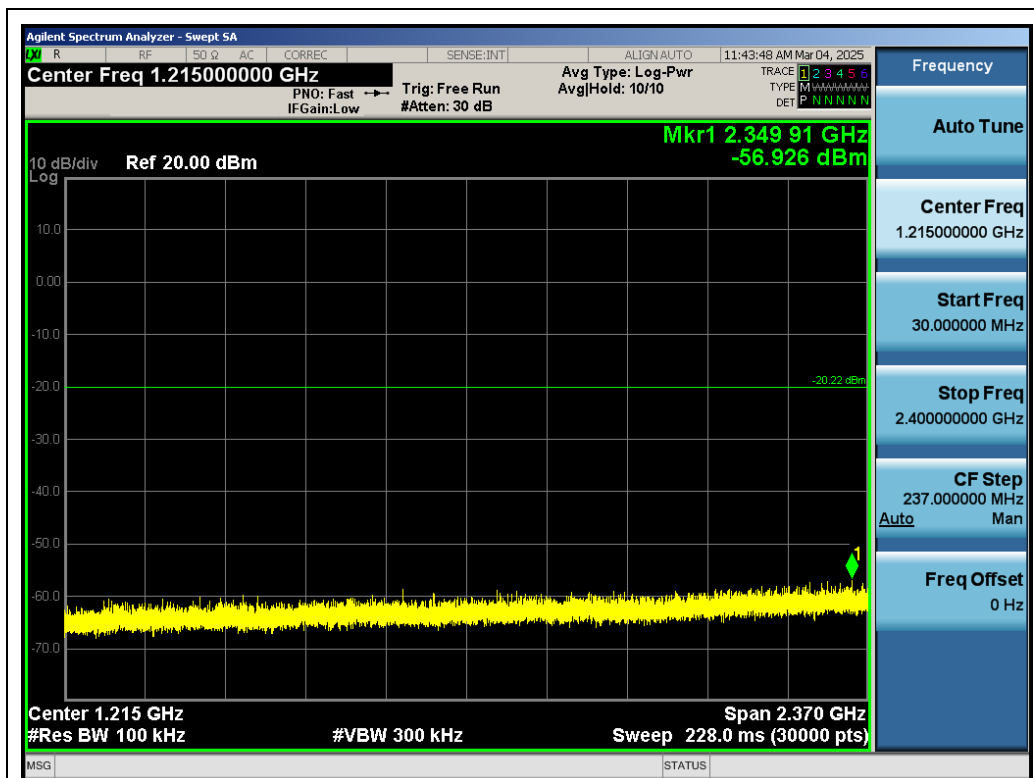




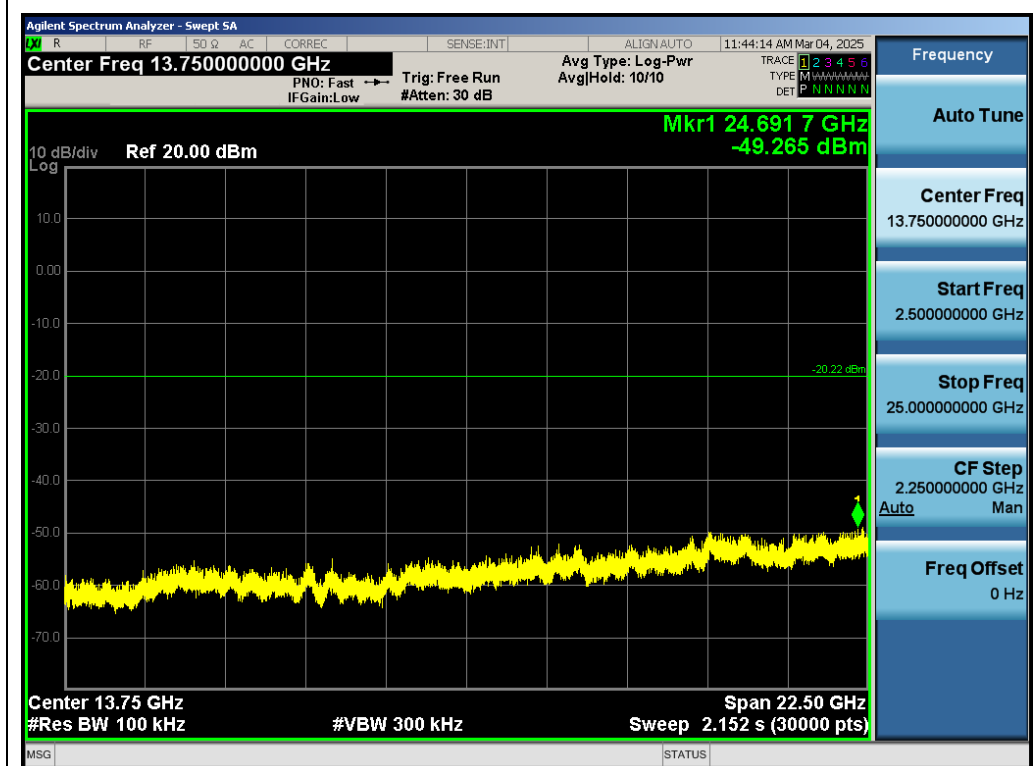
Test_Graph_EDR_ANT1_2441_2Mbps_Higher Band Emissions



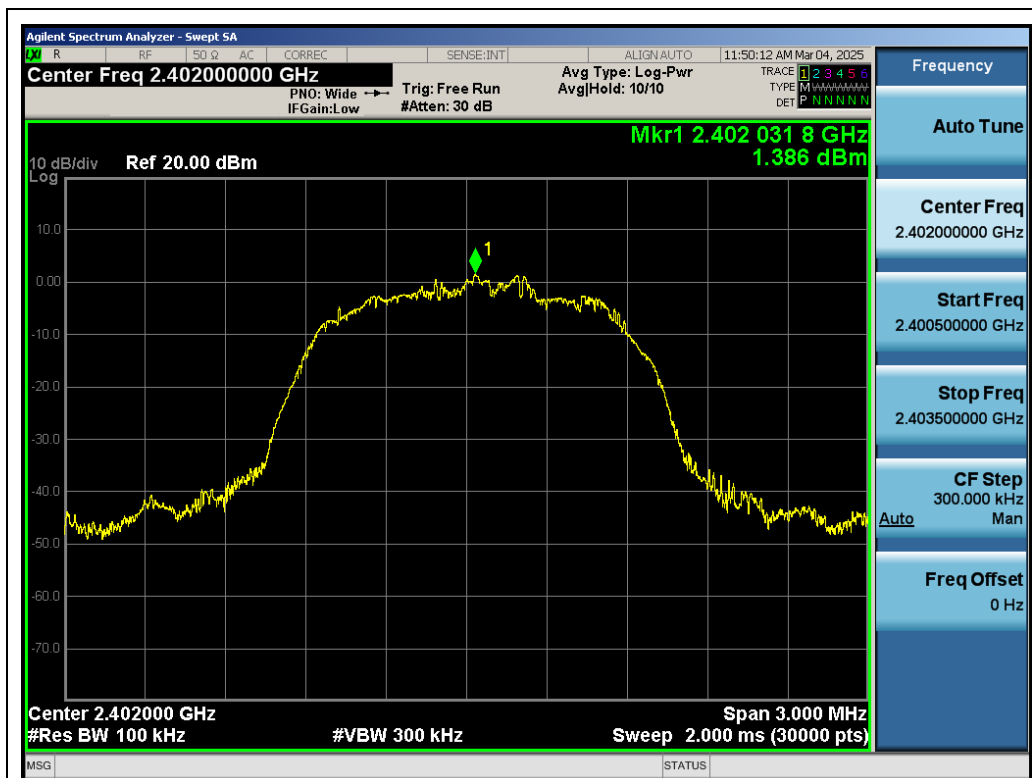
Test_Graph_EDR_ANT1_2480_2Mbps_Reference Level



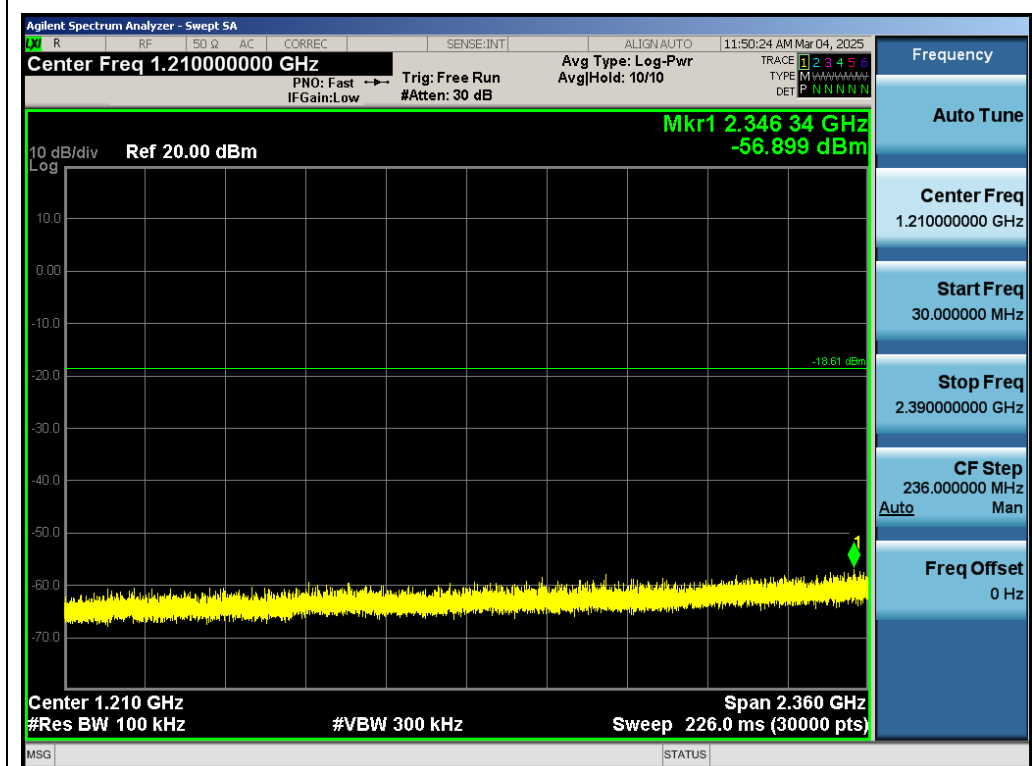
Test_Graph_EDR_ANT1_2480_2Mbps_Lower Band Emissions



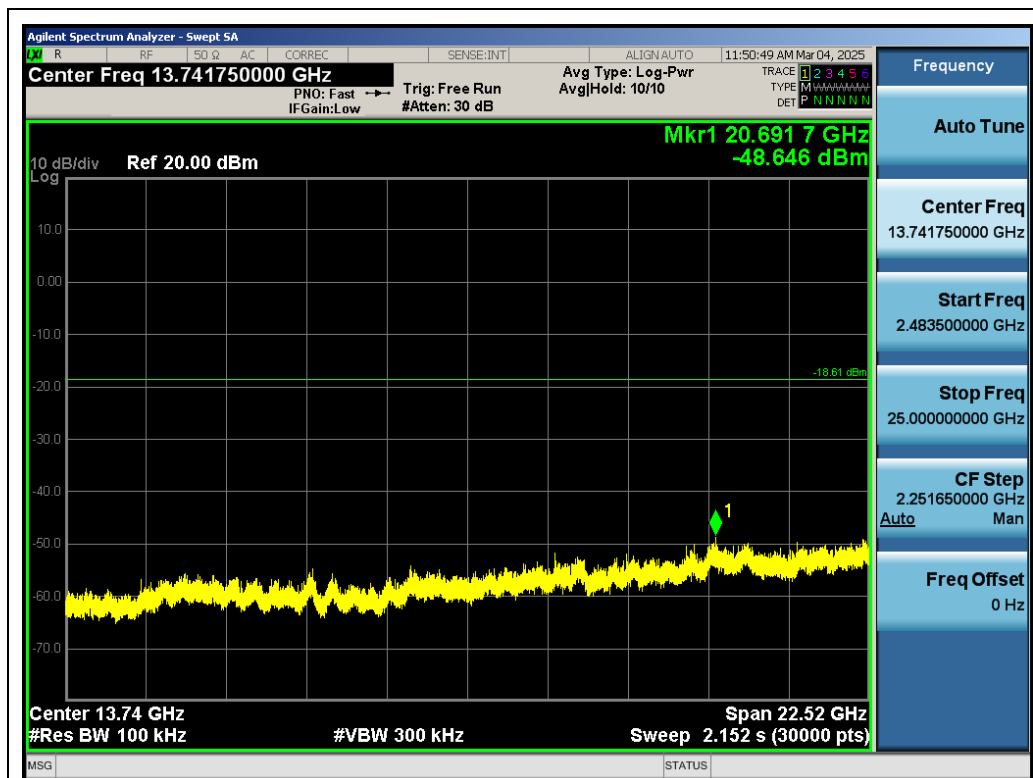
Test_Graph_EDR_ANT1_2480_2Mbps_Higher Band Emissions



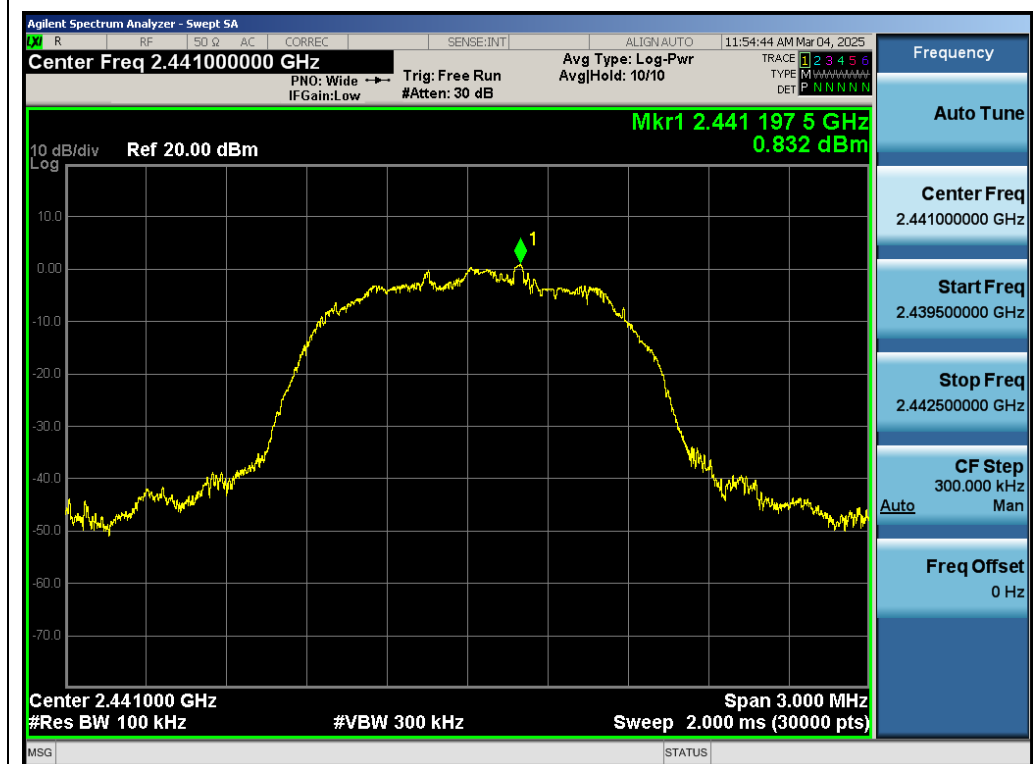
Test_Graph_EDR_ANT1_2402_3Mbps_Reference Level



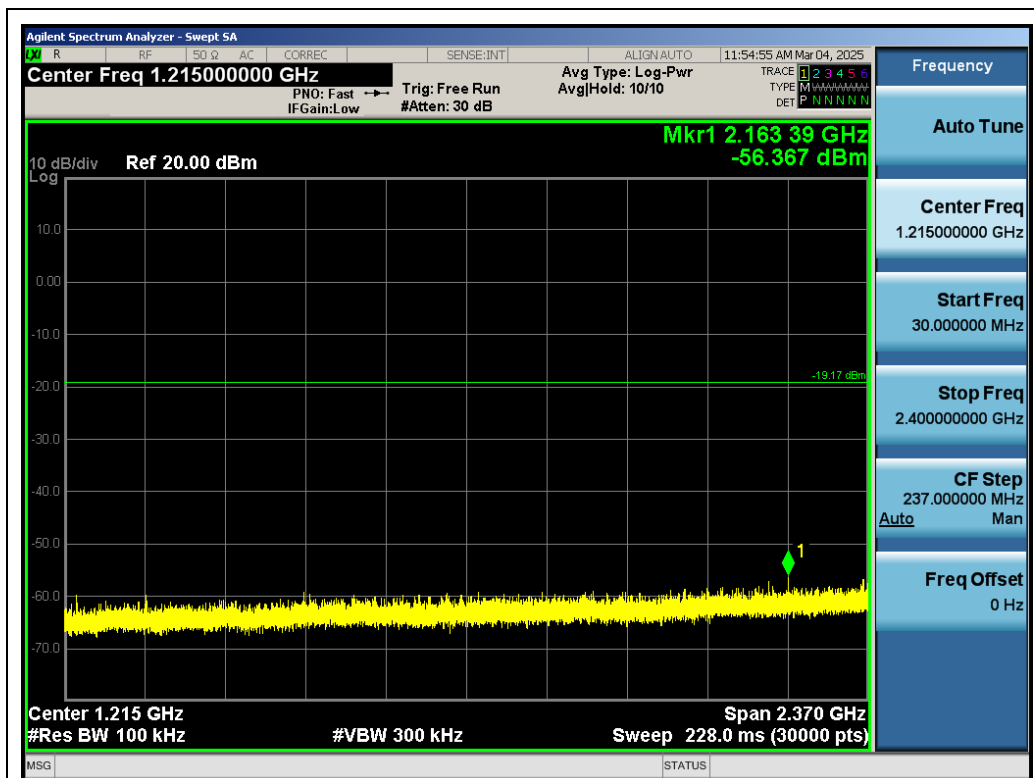
Test_Graph_EDR_ANT1_2402_3Mbps_Lower Band Emissions



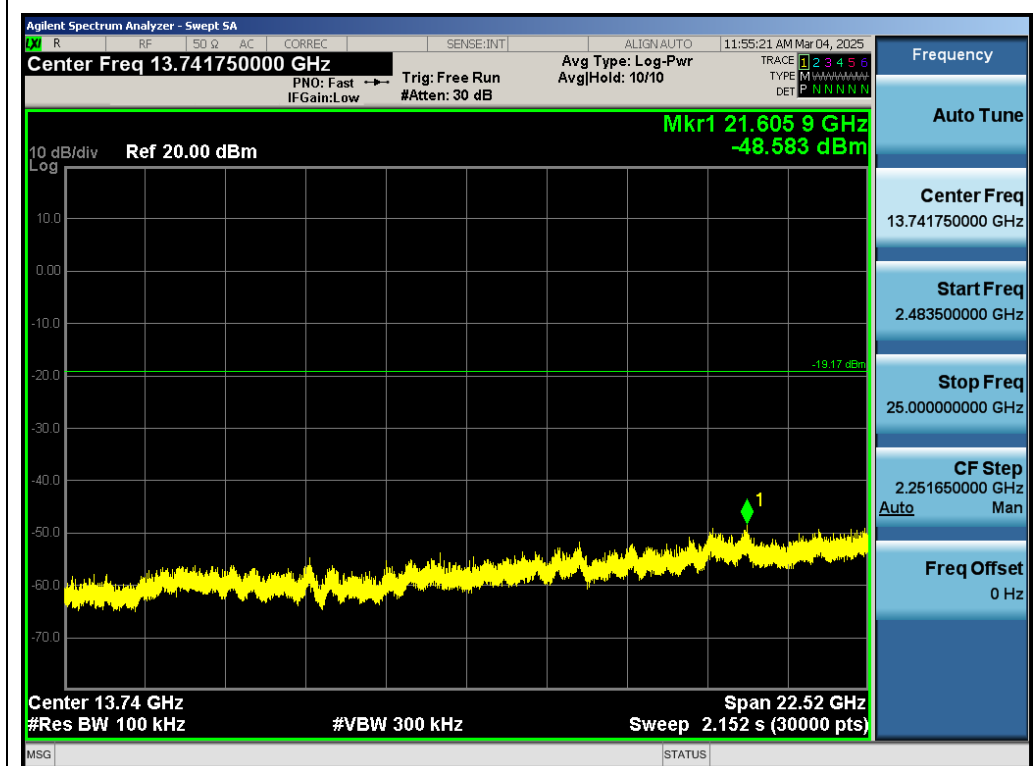
Test_Graph_EDR_ANT1_2402_3Mbps_Higher Band Emissions



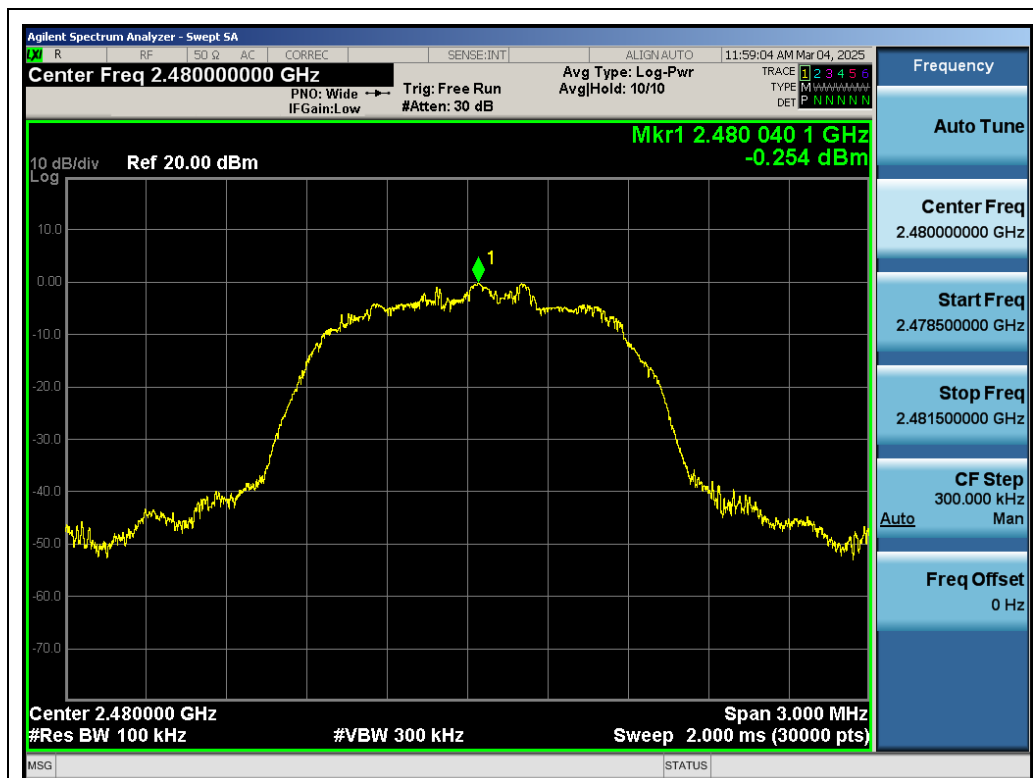
Test_Graph_EDR_ANT1_2441_3Mbps_Reference Level



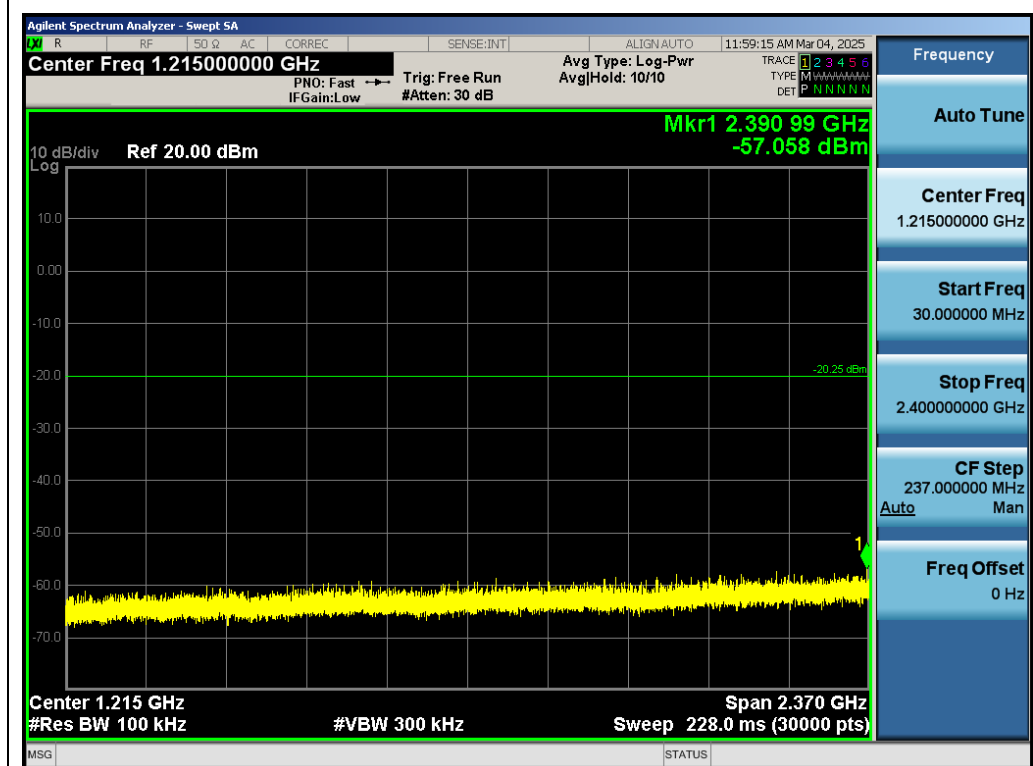
Test_Graph_EDR_ANT1_2441_3Mbps_Lower Band Emissions



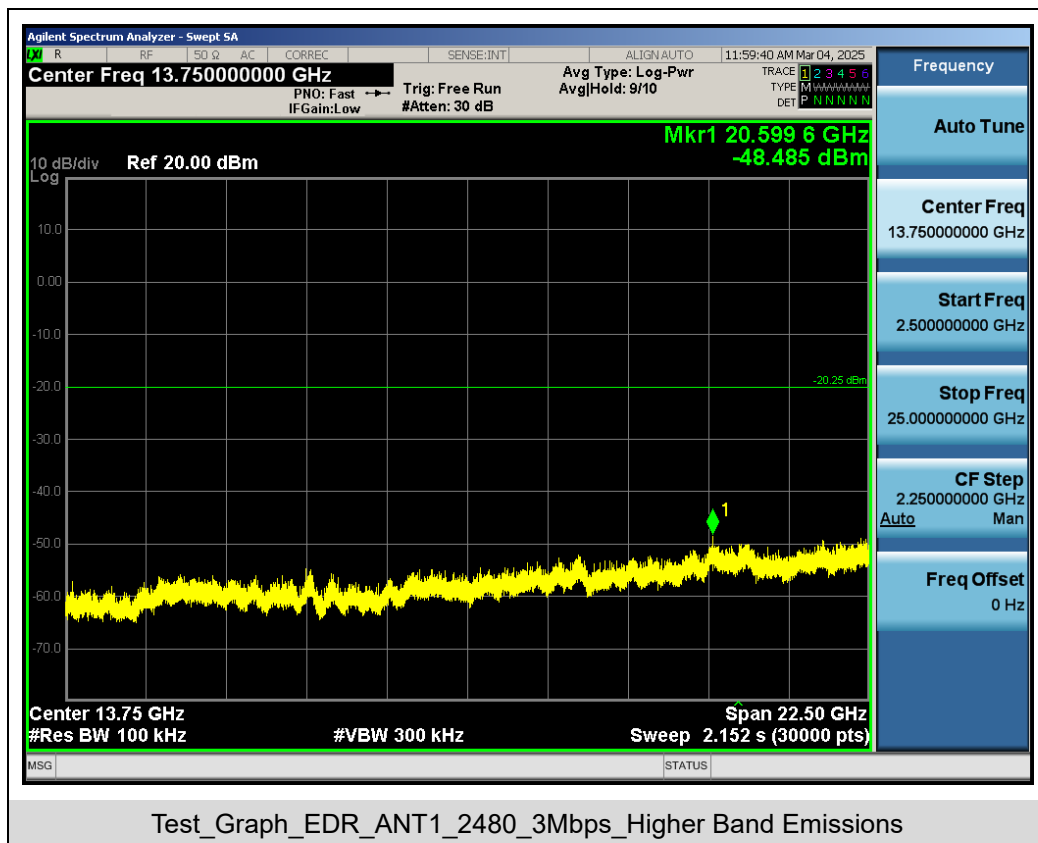
Test_Graph_EDR_ANT1_2441_3Mbps_Higher Band Emissions



Test_Graph_EDR_ANT1_2480_3Mbps_Reference Level



Test_Graph_EDR_ANT1_2480_3Mbps_Lower Band Emissions

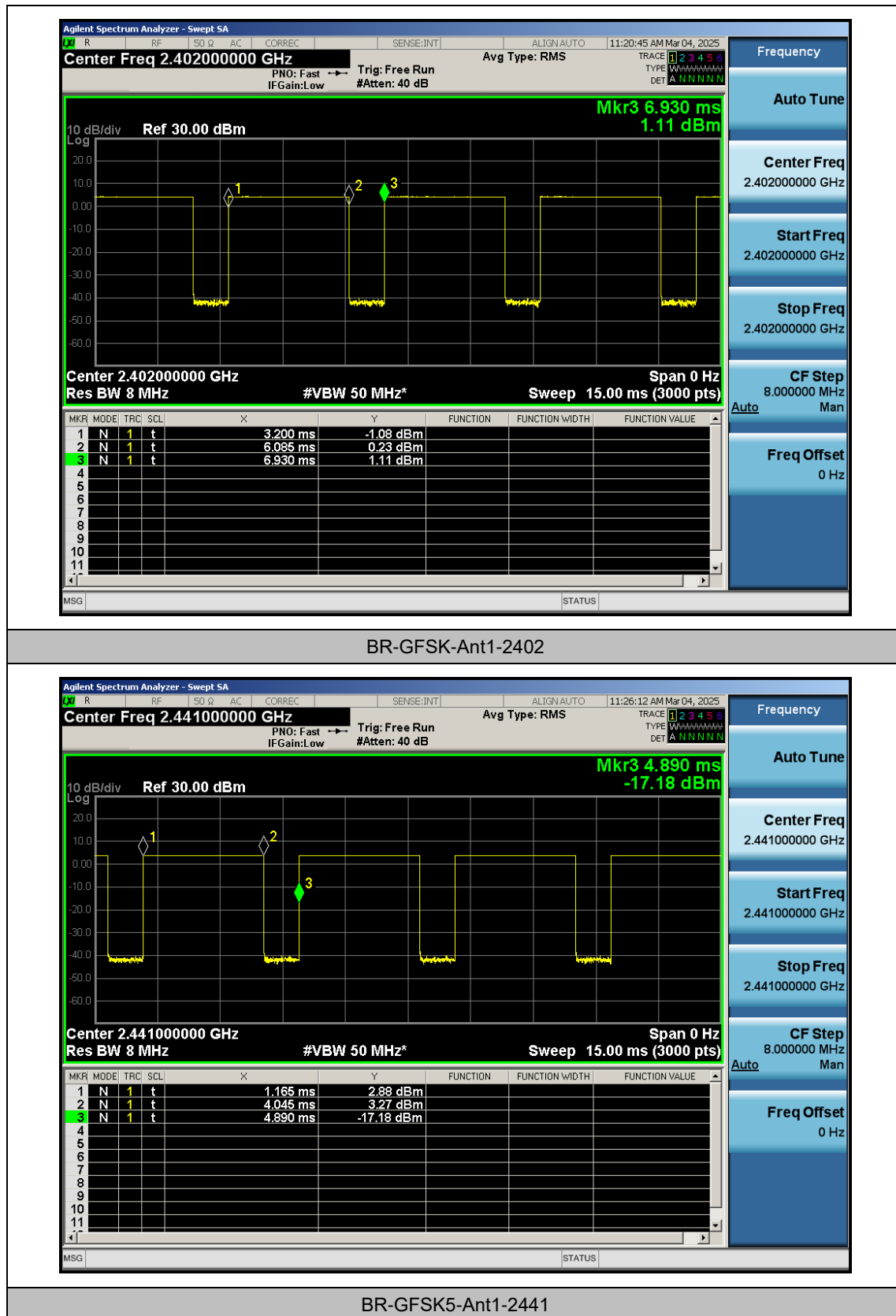


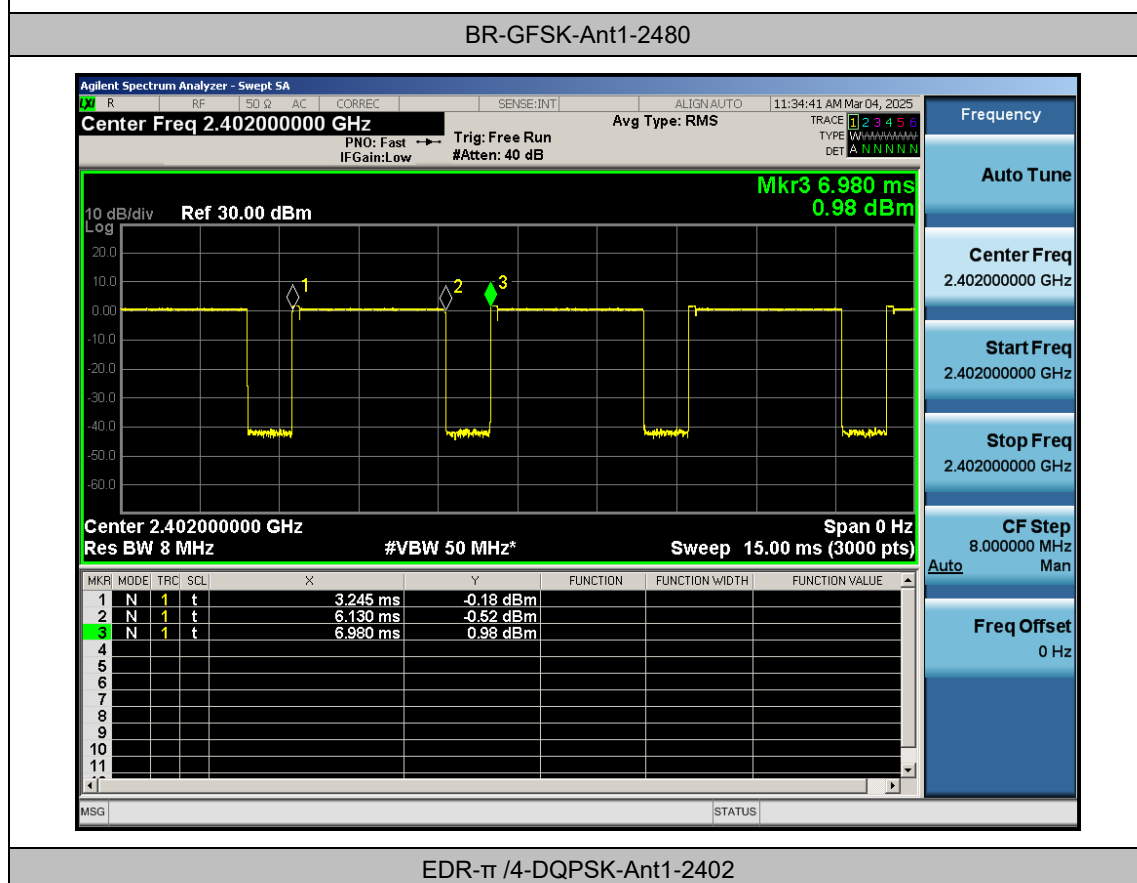
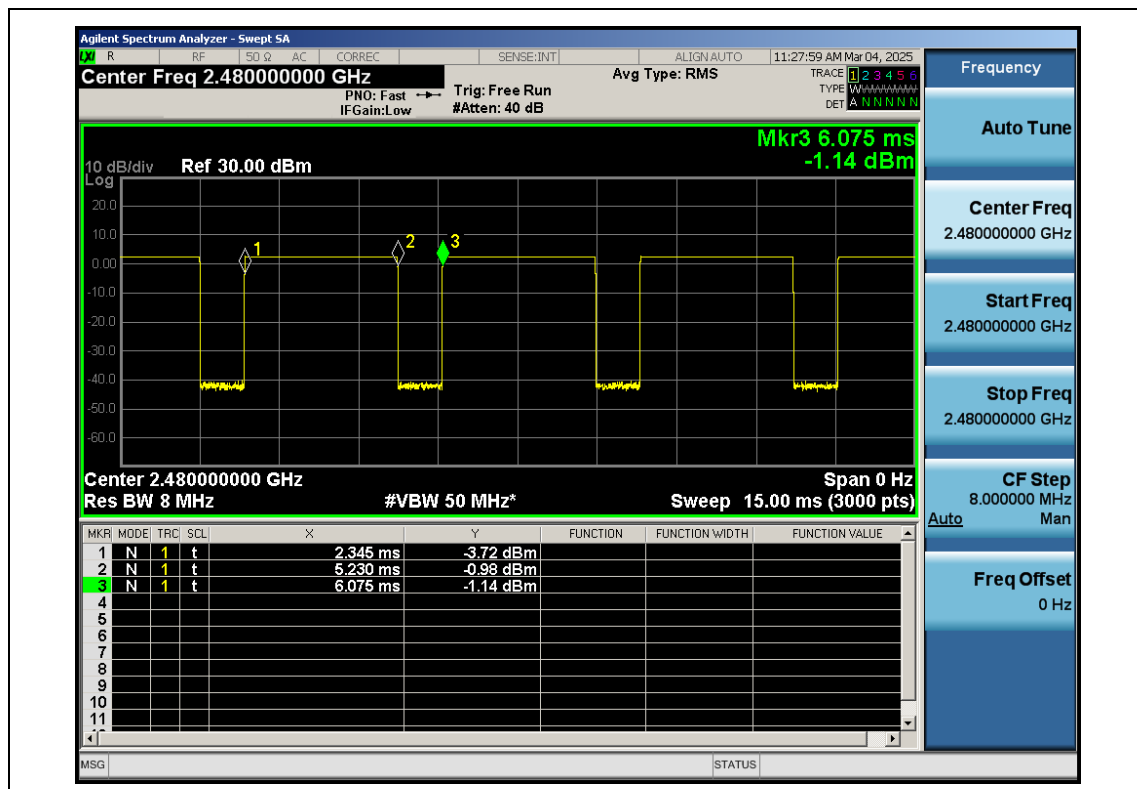
Appendix H: Duty Cycle

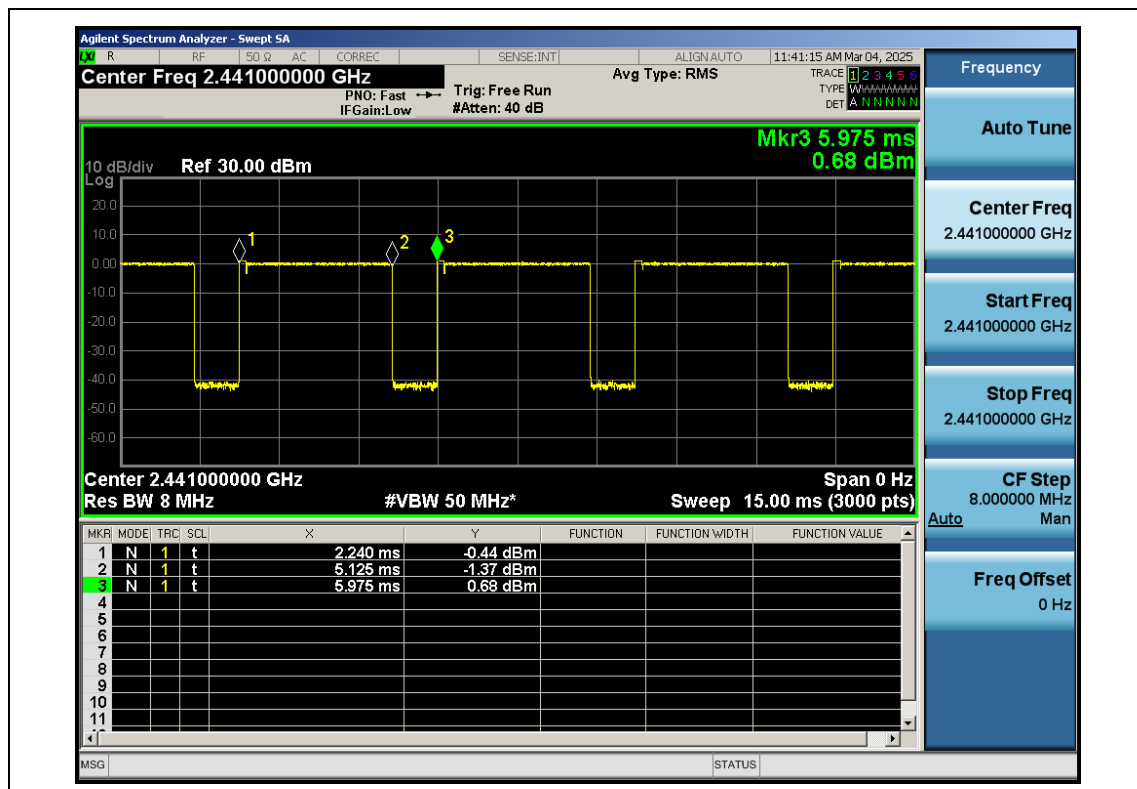
Test Result

Test Mode	Frequency [MHz]	ON Time [ms]	Period [ms]	Duty Cycle [%]	Duty Cycle Factor [dB]
GFSK	2402	2.89	3.75	77.34	1.14
GFSK	2441	2.88	3.73	77.31	1.14
GFSK	2480	2.89	3.73	77.34	1.14
$\pi/4$ -DQPSK	2402	2.89	3.74	77.24	1.14
$\pi/4$ -DQPSK	2441	2.89	3.74	77.24	1.14
$\pi/4$ -DQPSK	2480	2.89	3.73	77.26	1.14
8DPSK	2402	2.89	3.74	77.33	1.14
8DPSK	2441	2.89	3.74	77.33	1.14
8DPSK	2480	2.89	3.74	77.38	1.14

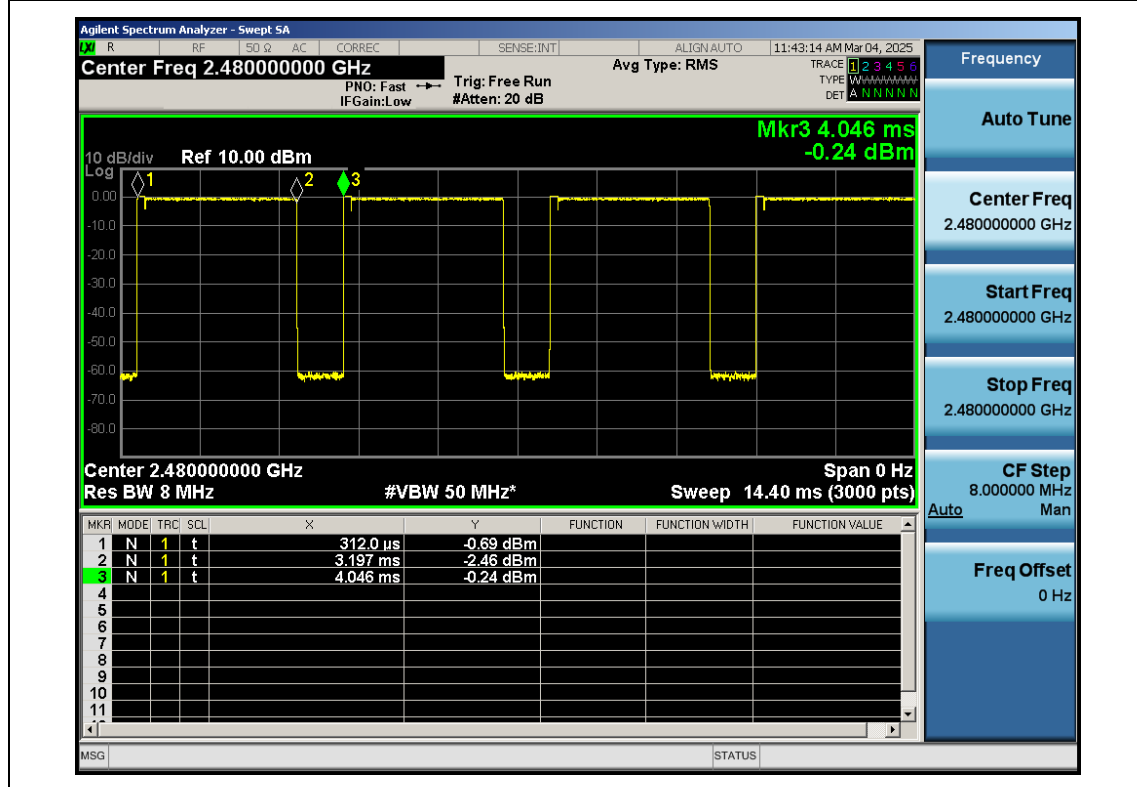
Test Graphs



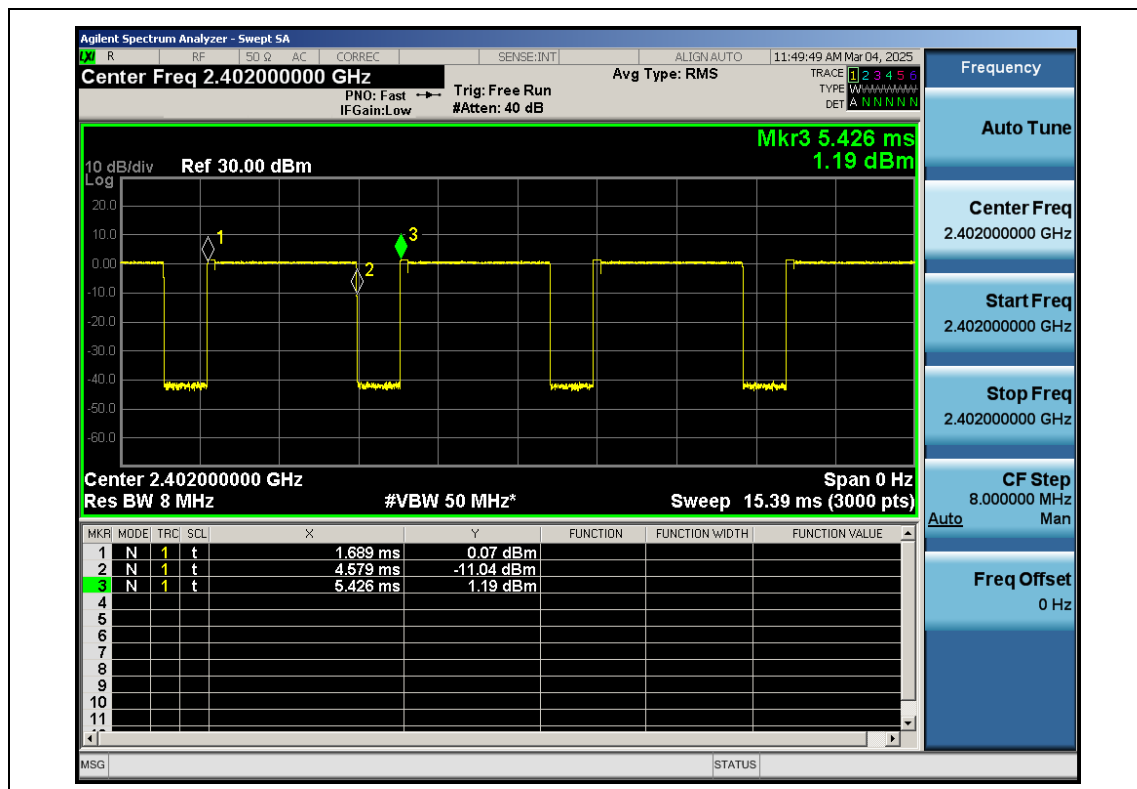




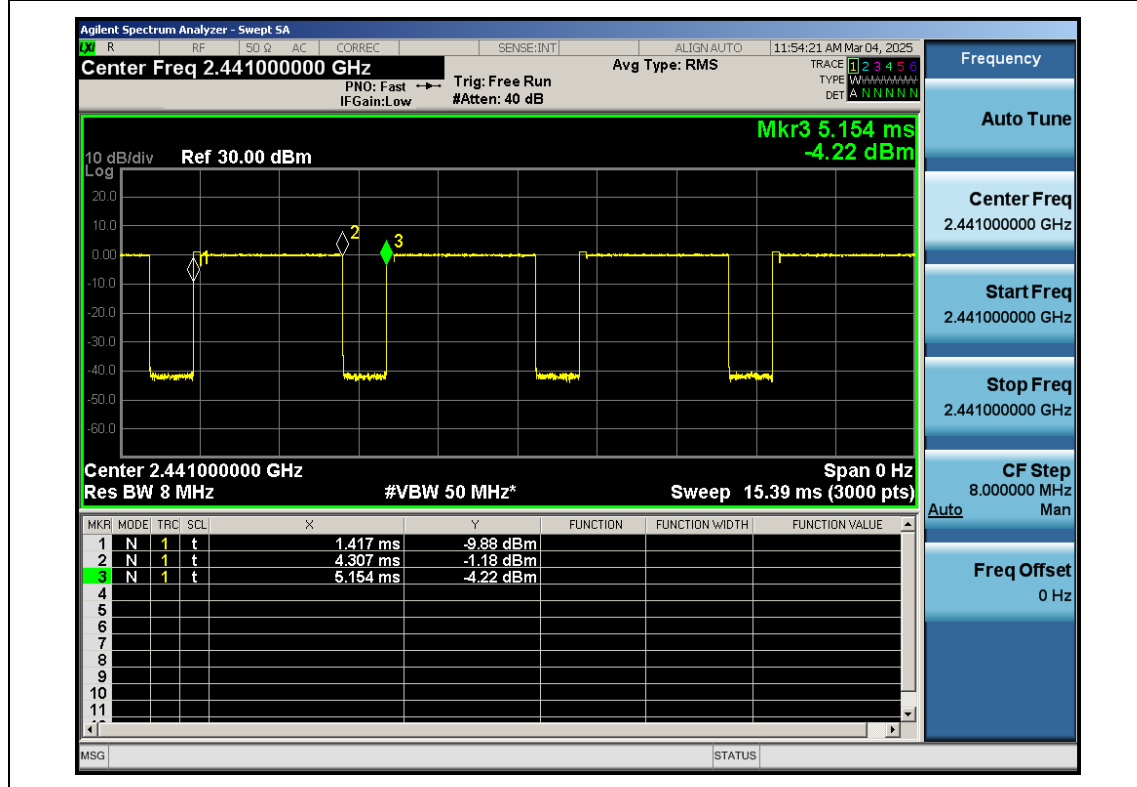
EDR-π /4-DQPSK-Ant1-2441



EDR-π /4-DQPSK-Ant1-2480



EDR--8DPSK-Ant1-2402



EDR-8DPSK-Ant1-2441

