

Appendix: Bluetooth LE

Contents

Appendix A: DTS Bandwidth 3

 Test Result 3

 Test Graphs 4

Appendix B: Occupied Channel Bandwidth 7

 Test Result 7

 Test Graphs 8

Appendix C: Maximum conducted output power 11

 Test Result Peak 11

 Test Graphs Peak 12

Appendix D: Maximum power spectral density 15

 Test Result 15

 Test Graphs 16

Appendix E: Band edge measurements 19

 Test Result 19

 Test Graphs 20

Appendix F: Conducted Spurious Emission 22

 Test Result 22

 Test Graphs 23

Appendix G: Duty Cycle 32

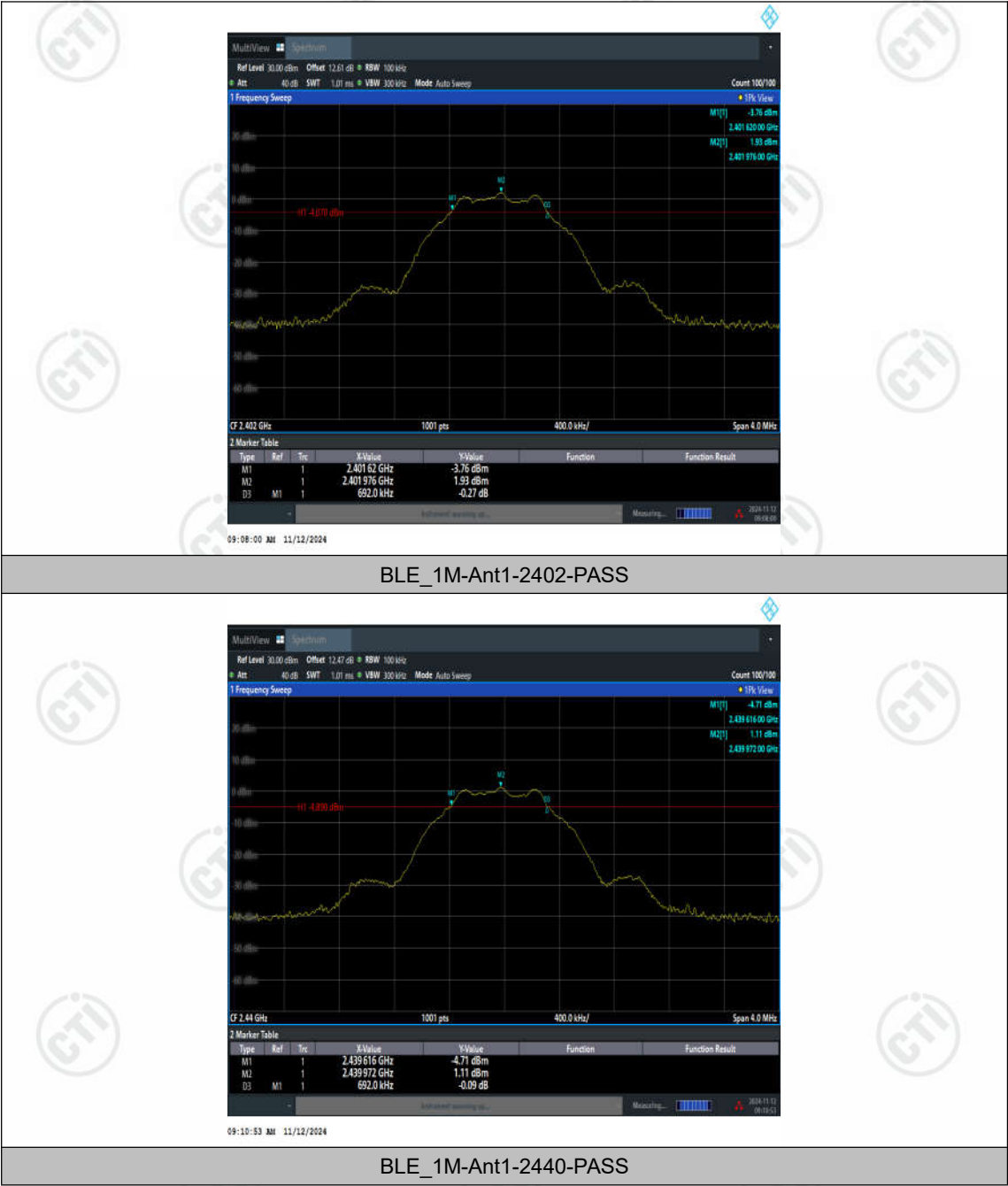
 Test Result 32

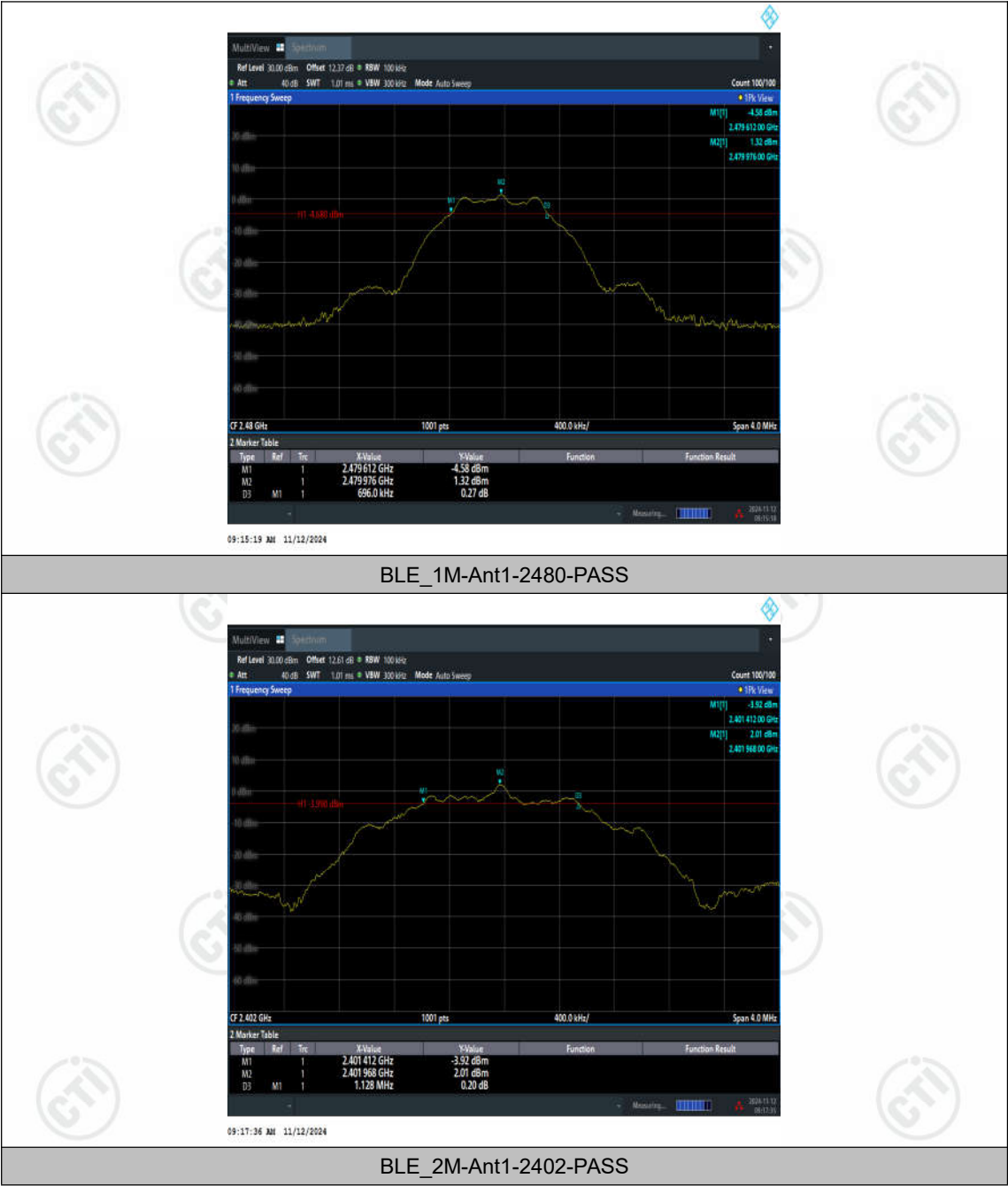
 Test Graphs 33

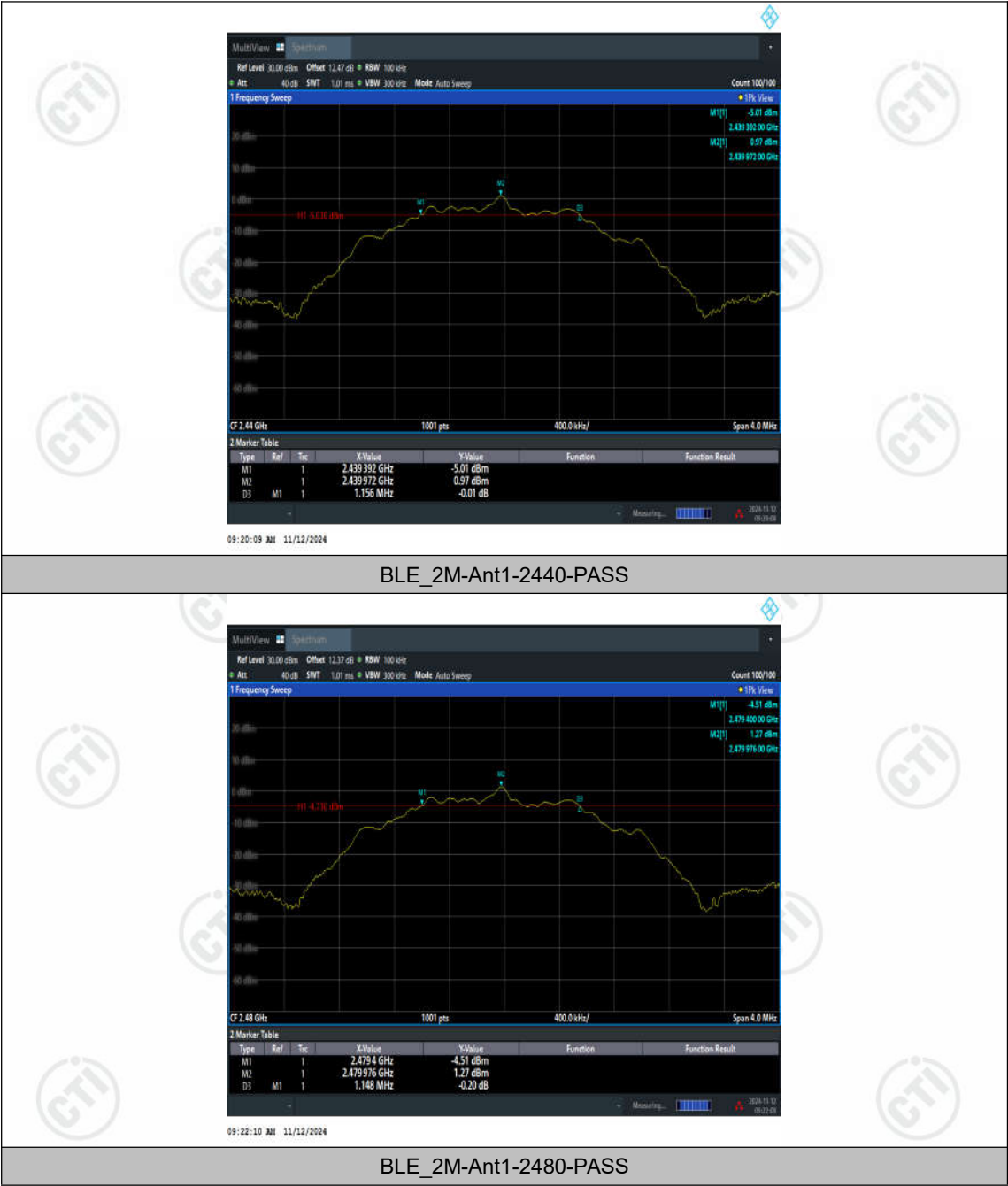
Appendix A: DTS Bandwidth**Test Result**

Test Mode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit [MHz]	Verdict
BLE_1M	Ant1	2402	0.69	2401.62	2402.31	0.5	PASS
BLE_1M	Ant1	2440	0.69	2439.62	2440.31	0.5	PASS
BLE_1M	Ant1	2480	0.70	2479.61	2480.31	0.5	PASS
BLE_2M	Ant1	2402	1.13	2401.41	2402.54	0.5	PASS
BLE_2M	Ant1	2440	1.16	2439.39	2440.55	0.5	PASS
BLE_2M	Ant1	2480	1.15	2479.40	2480.55	0.5	PASS

Test Graphs







Appendix B: Occupied Channel Bandwidth

Test Result

Test Mode	Antenna	Frequency [MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit [MHz]	Verdict
BLE_1M	Ant1	2402	1.052	2401.4496	2402.5020	---	---
BLE_1M	Ant1	2440	1.058	2439.4455	2440.5033	---	---
BLE_1M	Ant1	2480	1.059	2479.4448	2480.5036	---	---
BLE_2M	Ant1	2402	2.049	2400.9611	2403.0103	---	---
BLE_2M	Ant1	2440	2.056	2438.9560	2441.0117	---	---
BLE_2M	Ant1	2480	2.051	2478.9591	2481.0103	---	---

Test Graphs





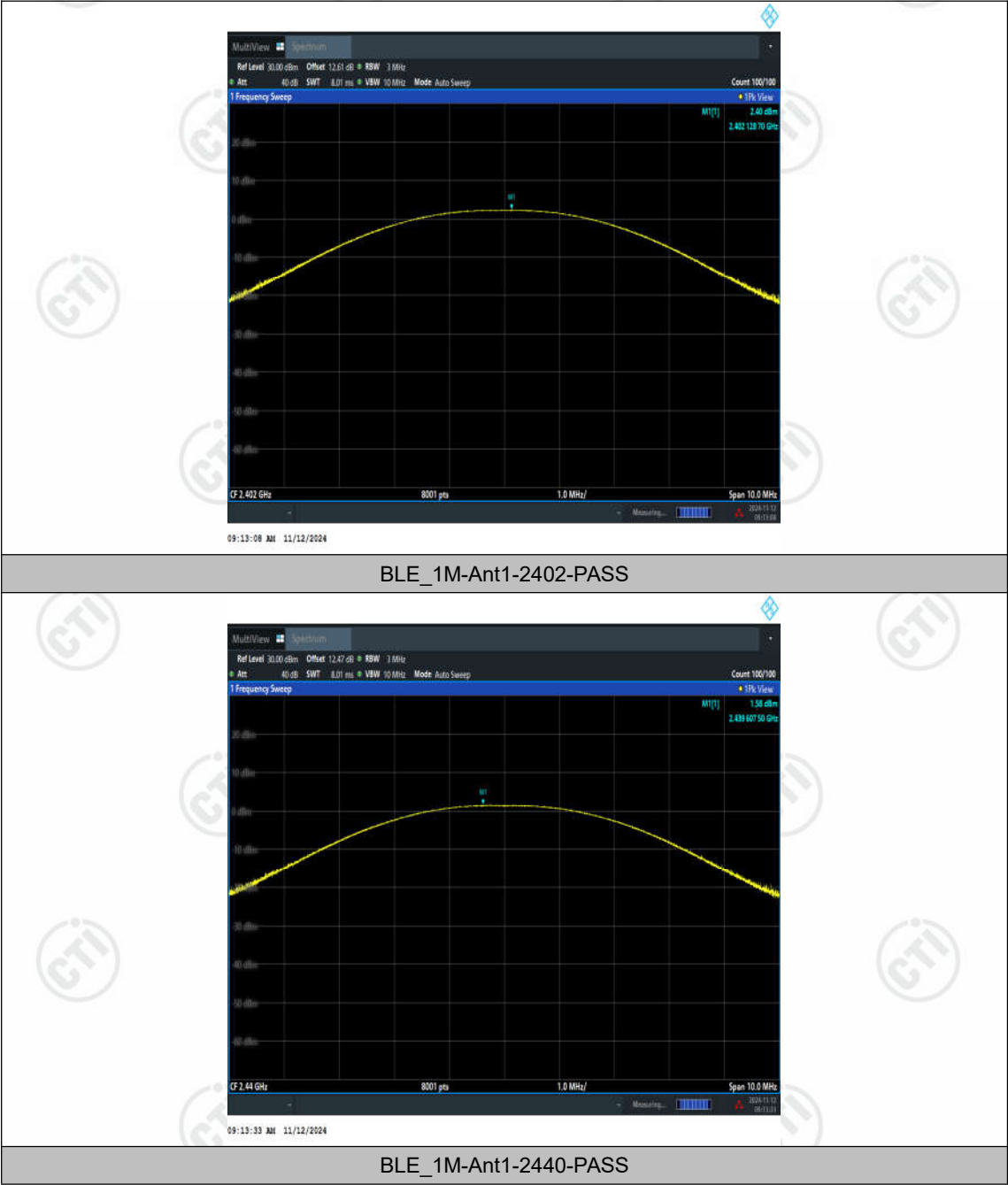


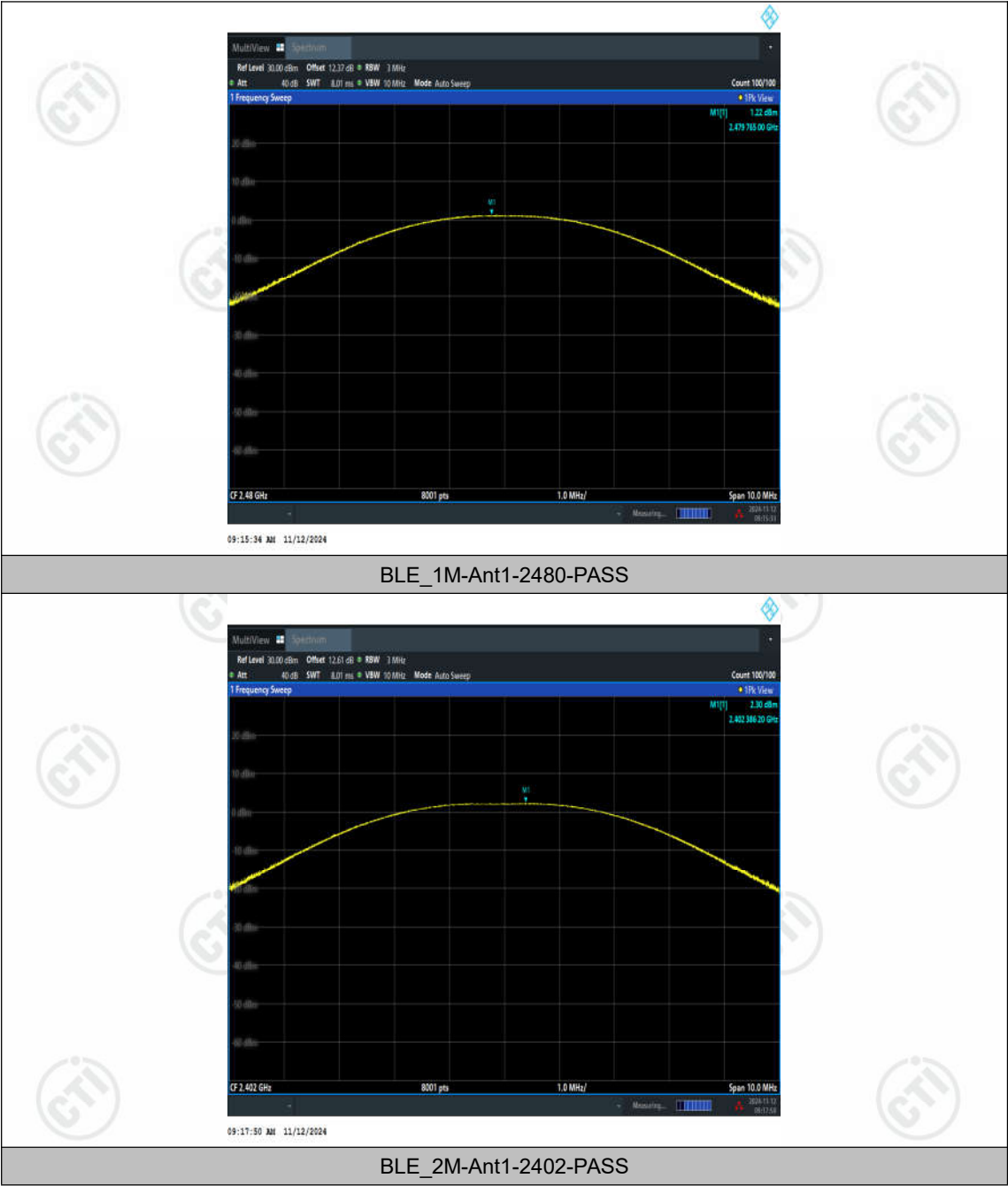
Appendix C: Maximum conducted output power

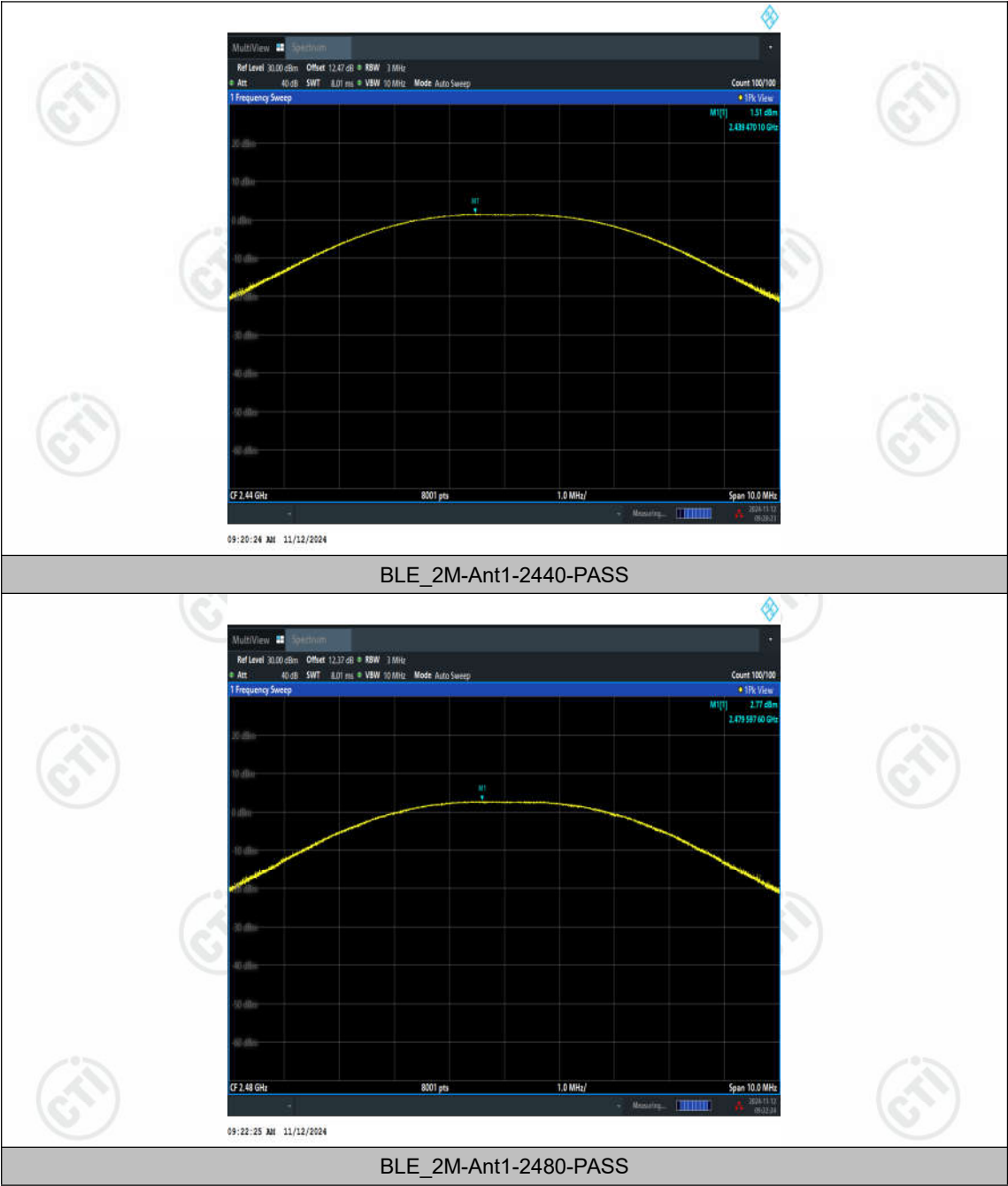
Test Result Peak

Test Mode	Antenna	Frequency [MHz]	Conducted Peak Power [dBm]	Conducted Limit [dBm]	Verdict
BLE_1M	Ant1	2402	2.40	≤30	PASS
BLE_1M	Ant1	2440	1.58	≤30	PASS
BLE_1M	Ant1	2480	1.22	≤30	PASS
BLE_2M	Ant1	2402	2.30	≤30	PASS
BLE_2M	Ant1	2440	1.51	≤30	PASS
BLE_2M	Ant1	2480	2.77	≤30	PASS

Test Graphs Peak





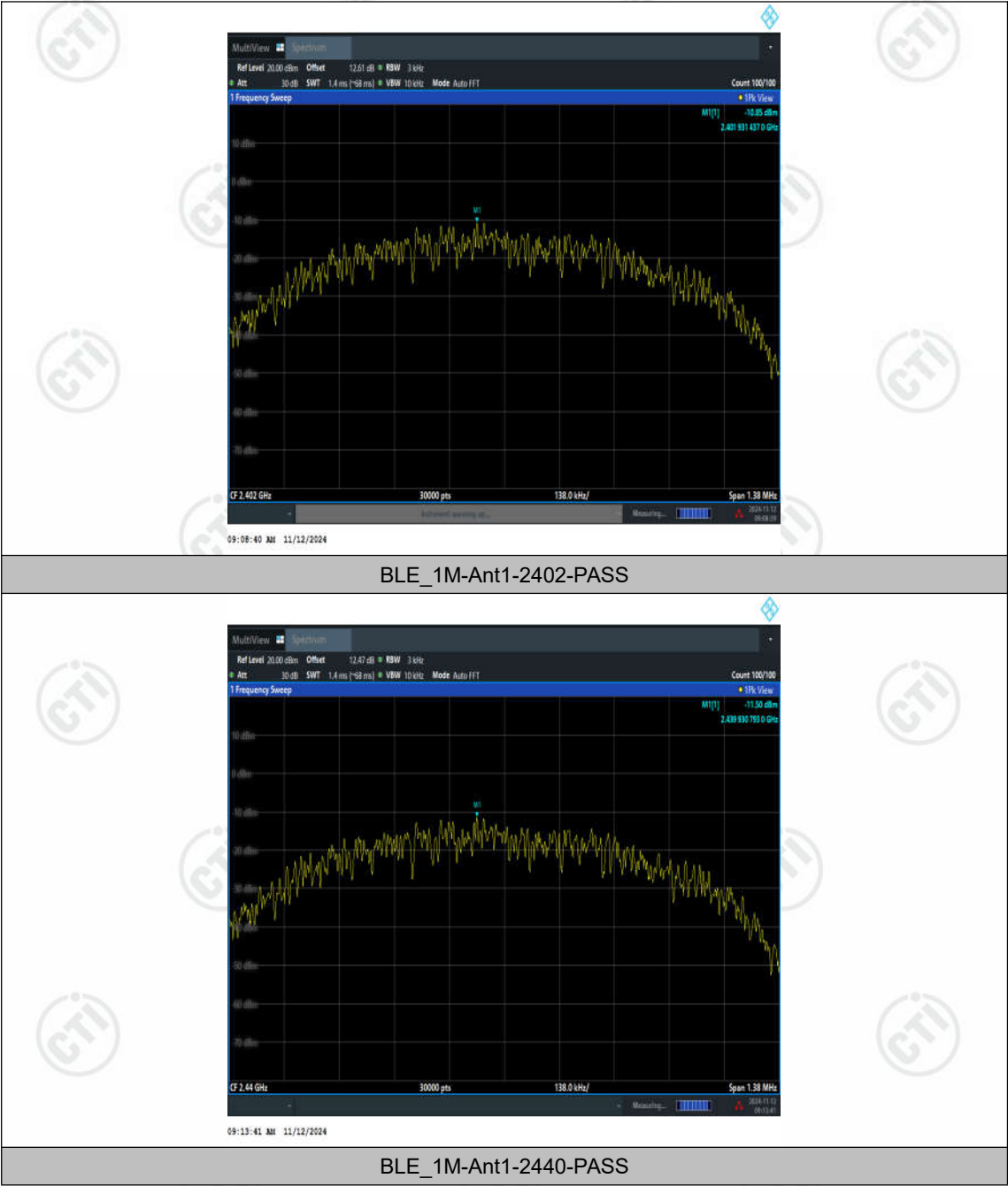


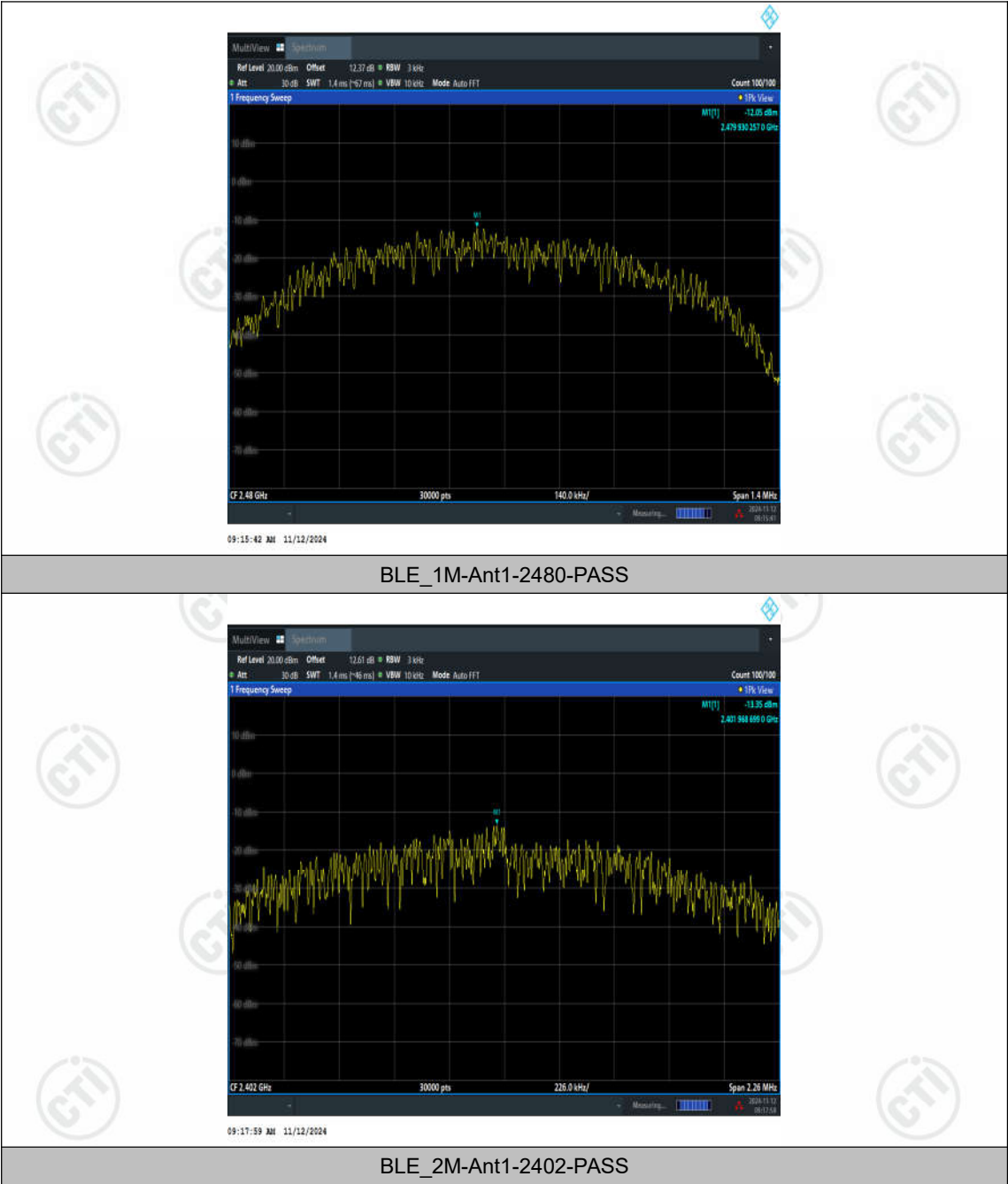
Appendix D: Maximum power spectral density

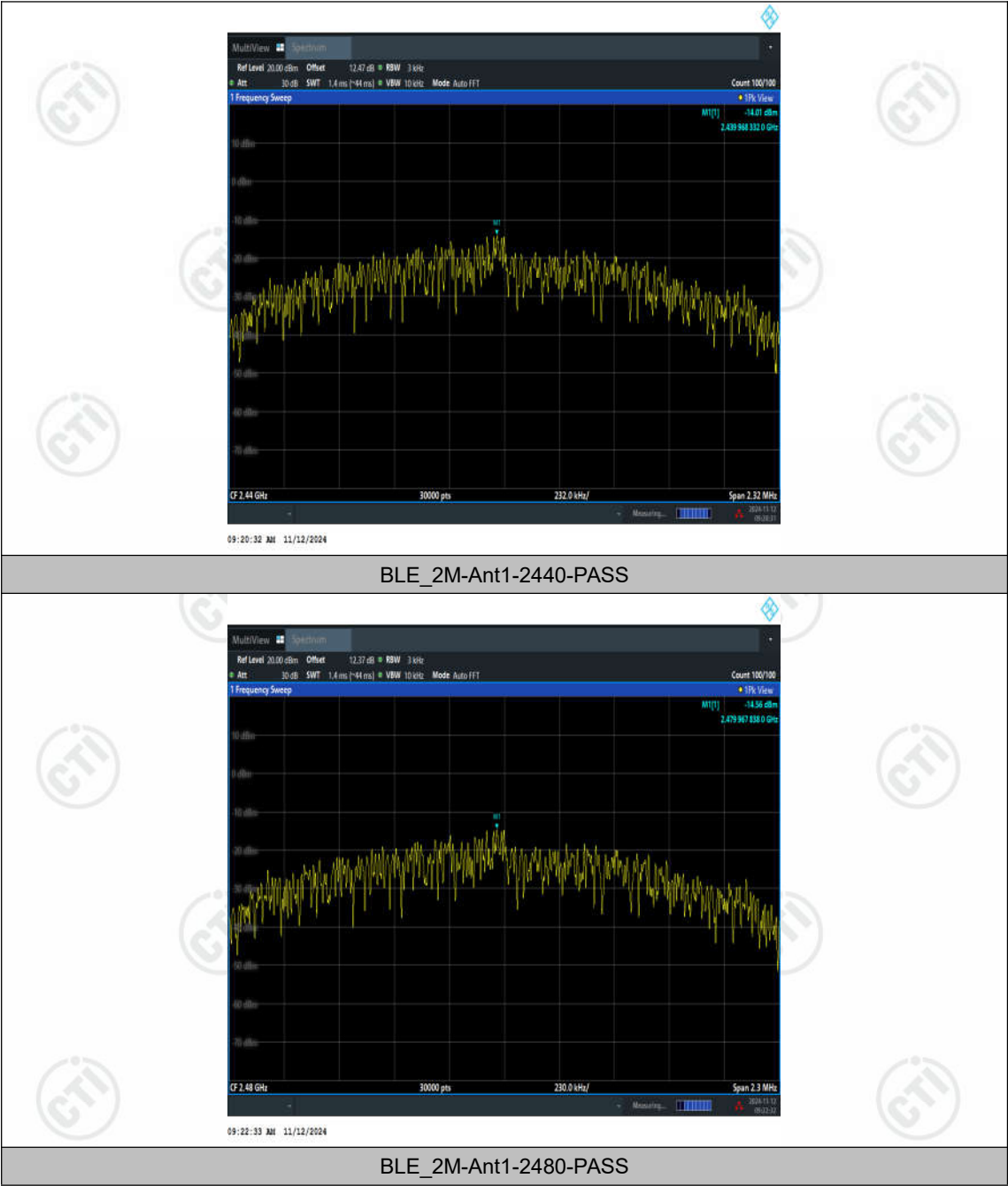
Test Result

Test Mode	Antenna	Frequency [MHz]	Result [dBm/3kHz]	Limit [dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-10.85	≤8.00	PASS
BLE_1M	Ant1	2440	-11.50	≤8.00	PASS
BLE_1M	Ant1	2480	-12.05	≤8.00	PASS
BLE_2M	Ant1	2402	-13.35	≤8.00	PASS
BLE_2M	Ant1	2440	-14.01	≤8.00	PASS
BLE_2M	Ant1	2480	-14.56	≤8.00	PASS

Test Graphs







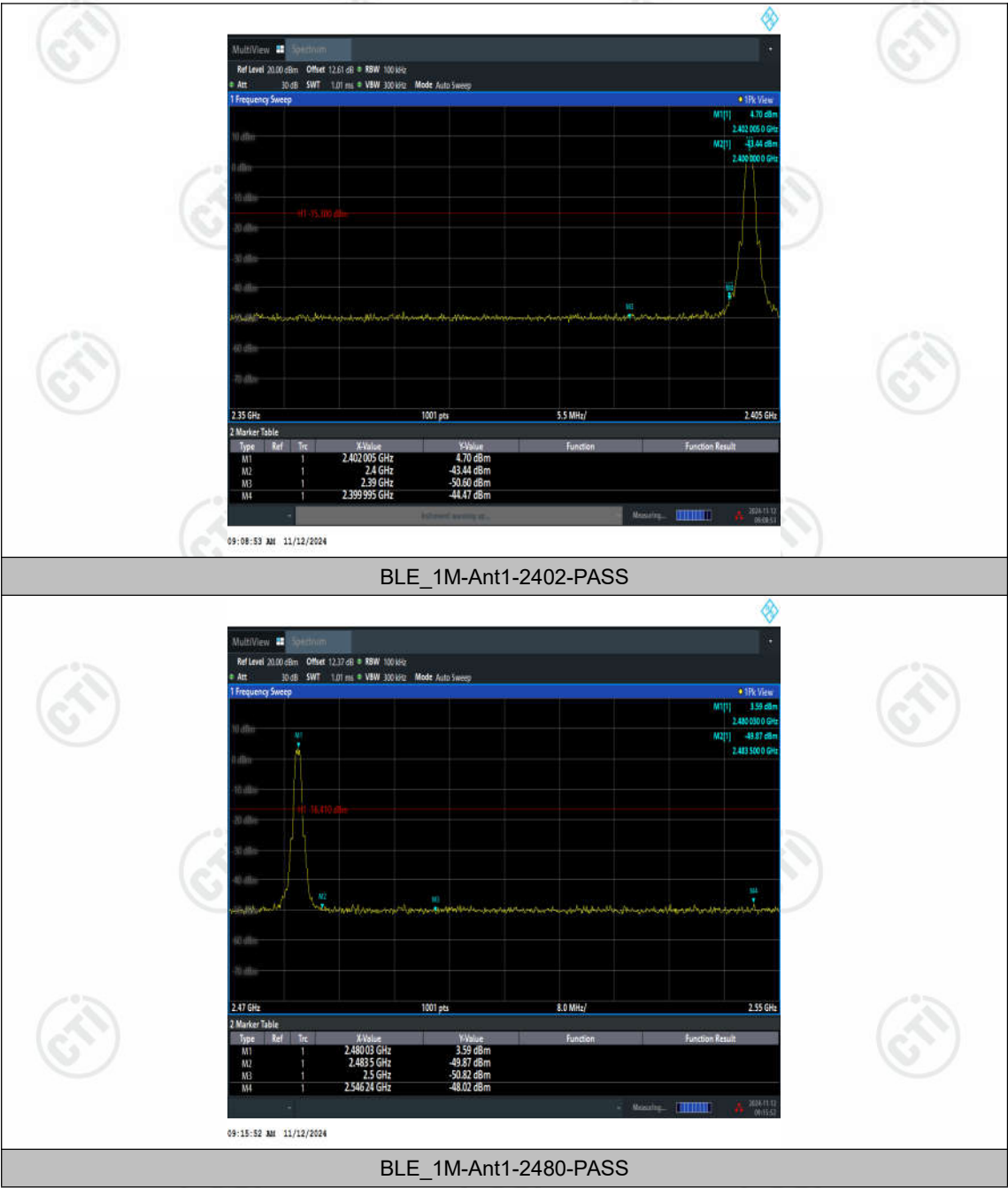
Appendix E: Band edge measurements

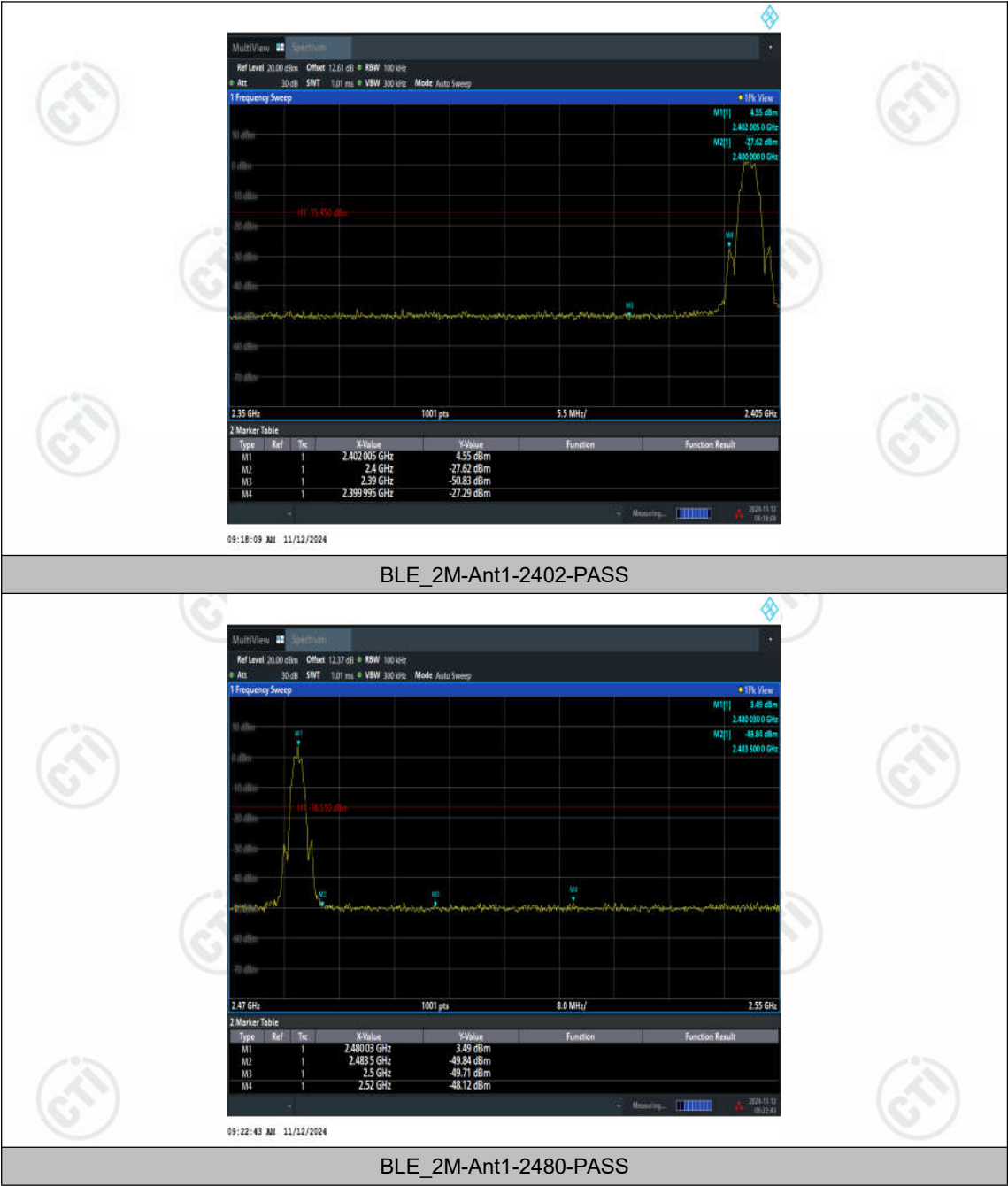
Test Result

Test Mode	Antenna	ChName	Frequency [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
BLE_1M	Ant1	Low	2402	4.70	-44.47	≤-15.30	PASS
BLE_1M	Ant1	High	2480	3.59	-48.02	≤-16.41	PASS
BLE_2M	Ant1	Low	2402	4.55	-27.29	≤-15.45	PASS
BLE_2M	Ant1	High	2480	3.49	-48.12	≤-16.51	PASS

Note:Limit[dBm]=RefLevel[dBm]-20;

Test Graphs





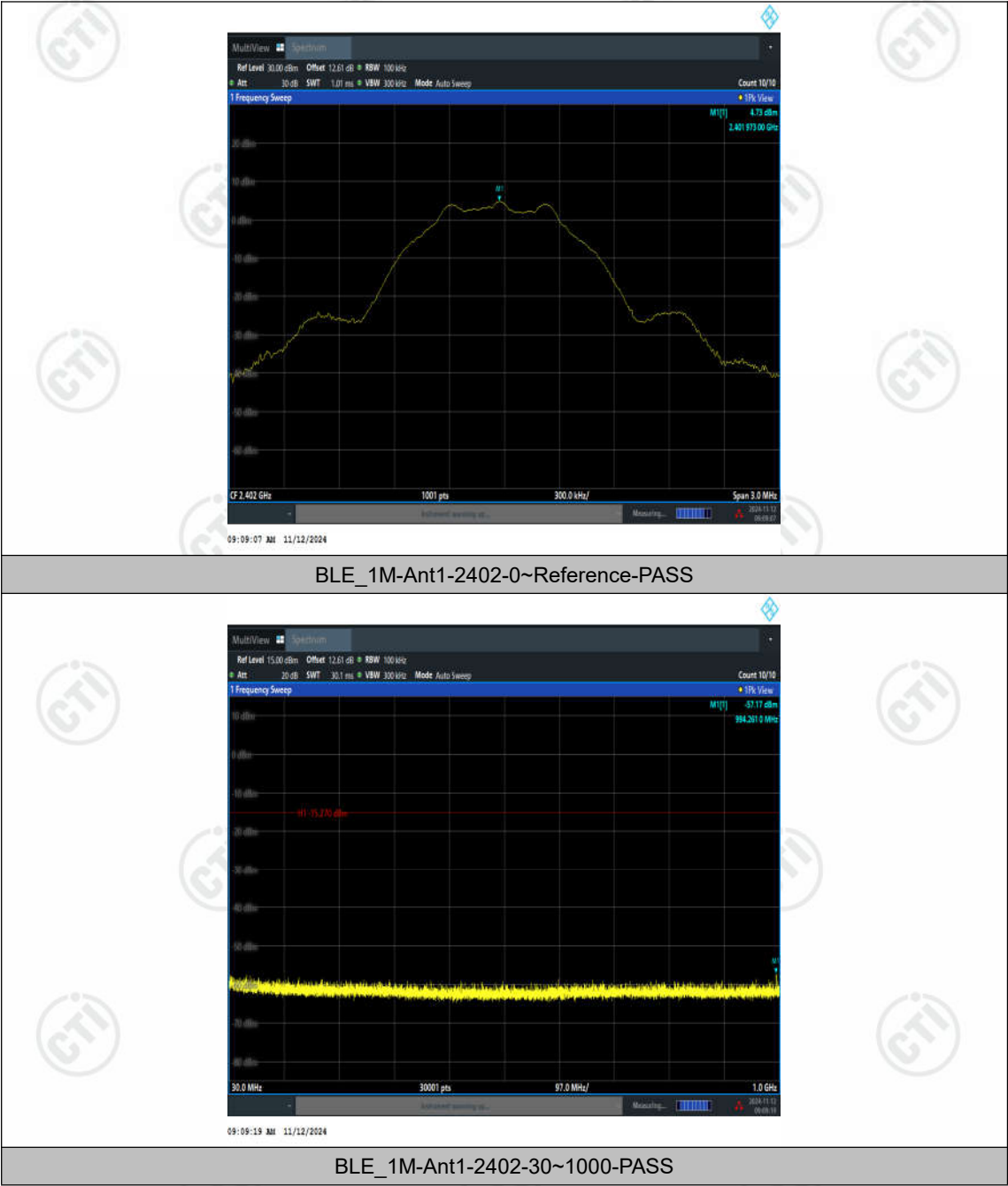
Appendix F: Conducted Spurious Emission

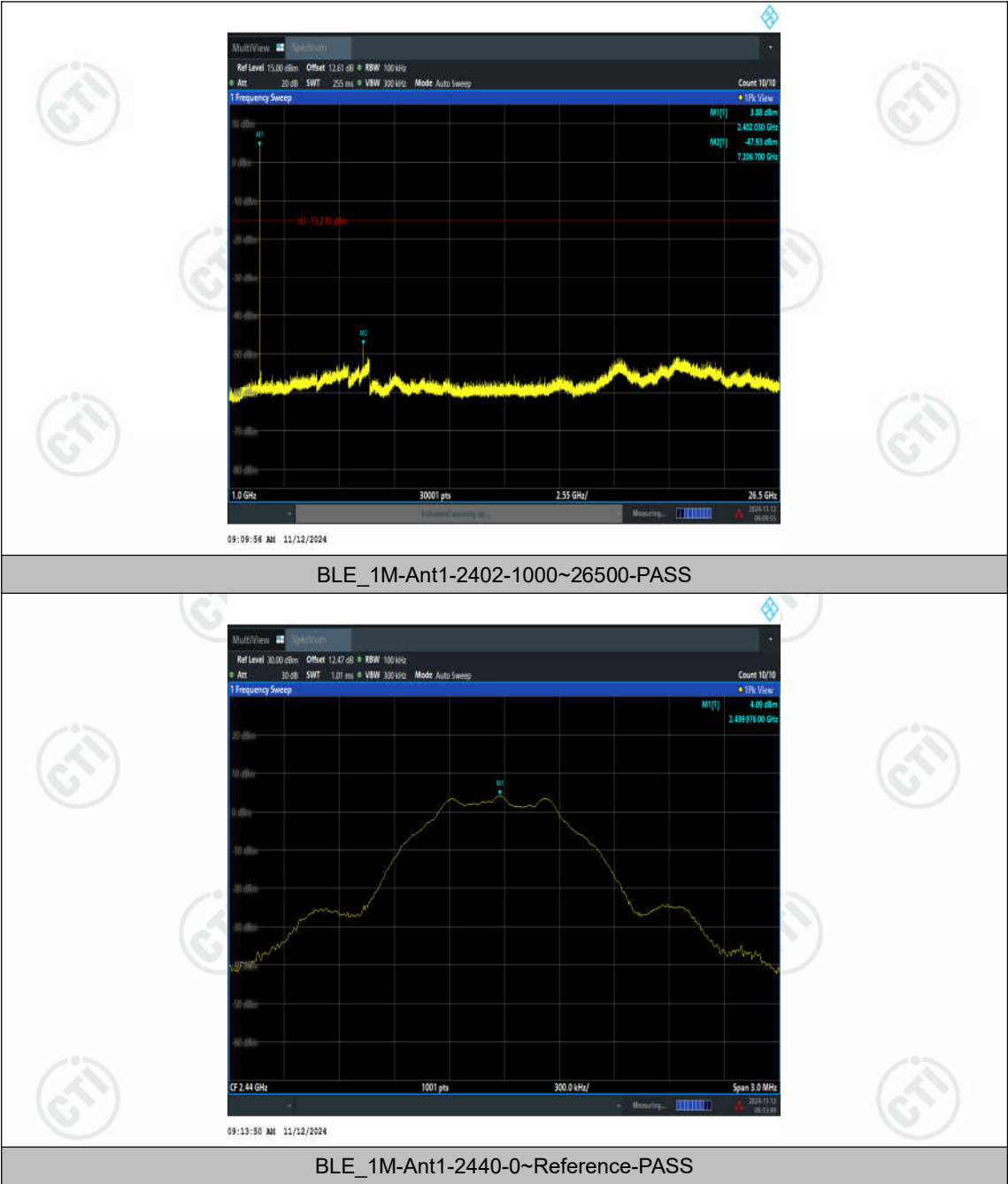
Test Result

Test Mode	Antenna	Frequency [MHz]	FreqRange [MHz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
BLE_1M	Ant1	2402	0~Reference	4.73	4.73	---	PASS
BLE_1M	Ant1	2402	30~1000	4.73	-57.17	≤-15.27	PASS
BLE_1M	Ant1	2402	1000~26500	4.73	-47.93	≤-15.27	PASS
BLE_1M	Ant1	2440	0~Reference	4.09	4.09	---	PASS
BLE_1M	Ant1	2440	30~1000	4.09	-55.99	≤-15.91	PASS
BLE_1M	Ant1	2440	1000~26500	4.09	-46.01	≤-15.91	PASS
BLE_1M	Ant1	2480	0~Reference	3.62	3.62	---	PASS
BLE_1M	Ant1	2480	30~1000	3.62	-56.71	≤-16.38	PASS
BLE_1M	Ant1	2480	1000~26500	3.62	-40.39	≤-16.38	PASS
BLE_2M	Ant1	2402	0~Reference	4.58	4.58	---	PASS
BLE_2M	Ant1	2402	30~1000	4.58	-56.7	≤-15.42	PASS
BLE_2M	Ant1	2402	1000~26500	4.58	-46.71	≤-15.42	PASS
BLE_2M	Ant1	2440	0~Reference	4.03	4.03	---	PASS
BLE_2M	Ant1	2440	30~1000	4.03	-56.52	≤-15.97	PASS
BLE_2M	Ant1	2440	1000~26500	4.03	-45.72	≤-15.97	PASS
BLE_2M	Ant1	2480	0~Reference	3.56	3.56	---	PASS
BLE_2M	Ant1	2480	30~1000	3.56	-55.93	≤-16.44	PASS
BLE_2M	Ant1	2480	1000~26500	3.56	-44.83	≤-16.44	PASS

Note: Limit[dBm]=RefLevel[dBm]-20;

Test Graphs



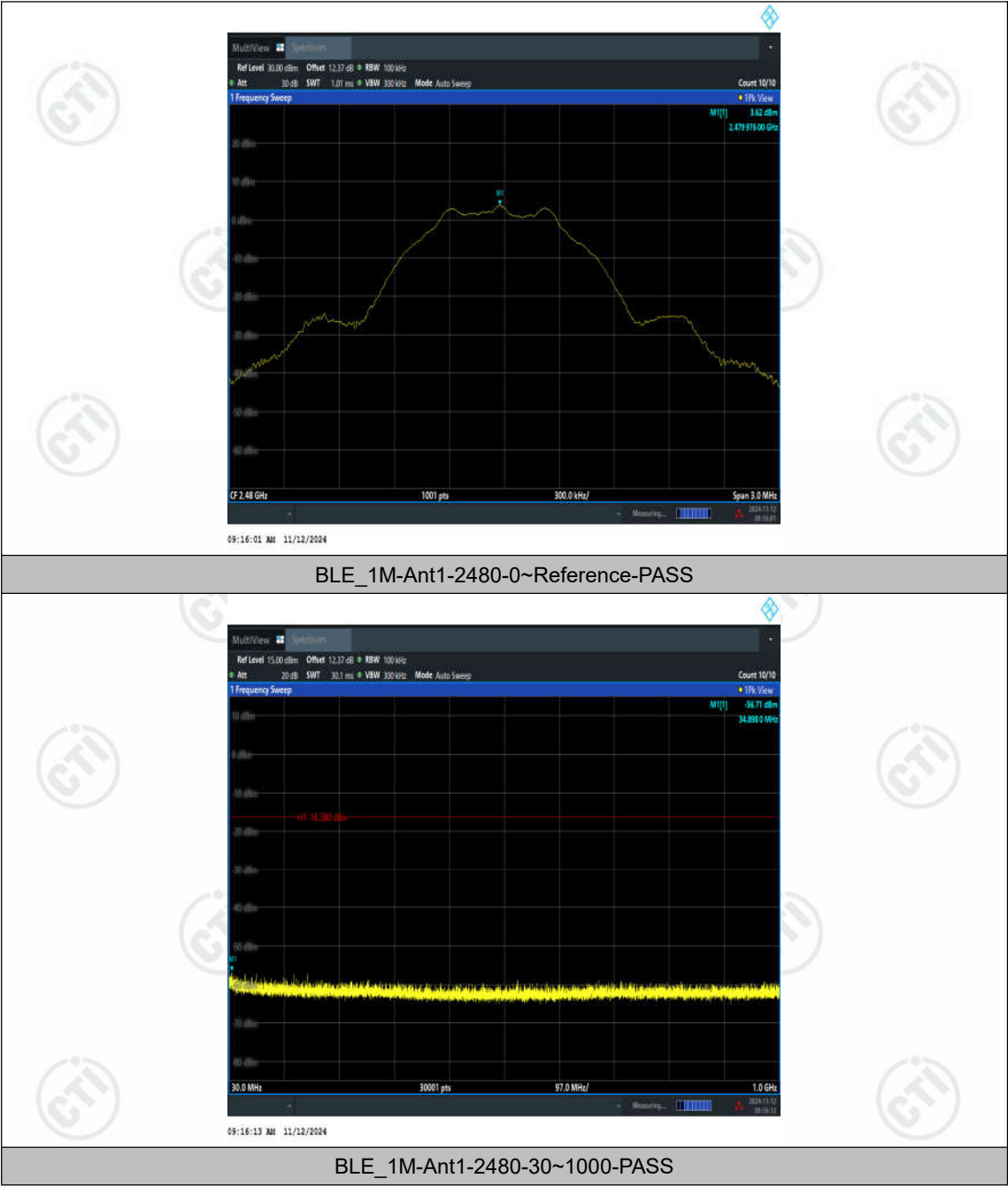


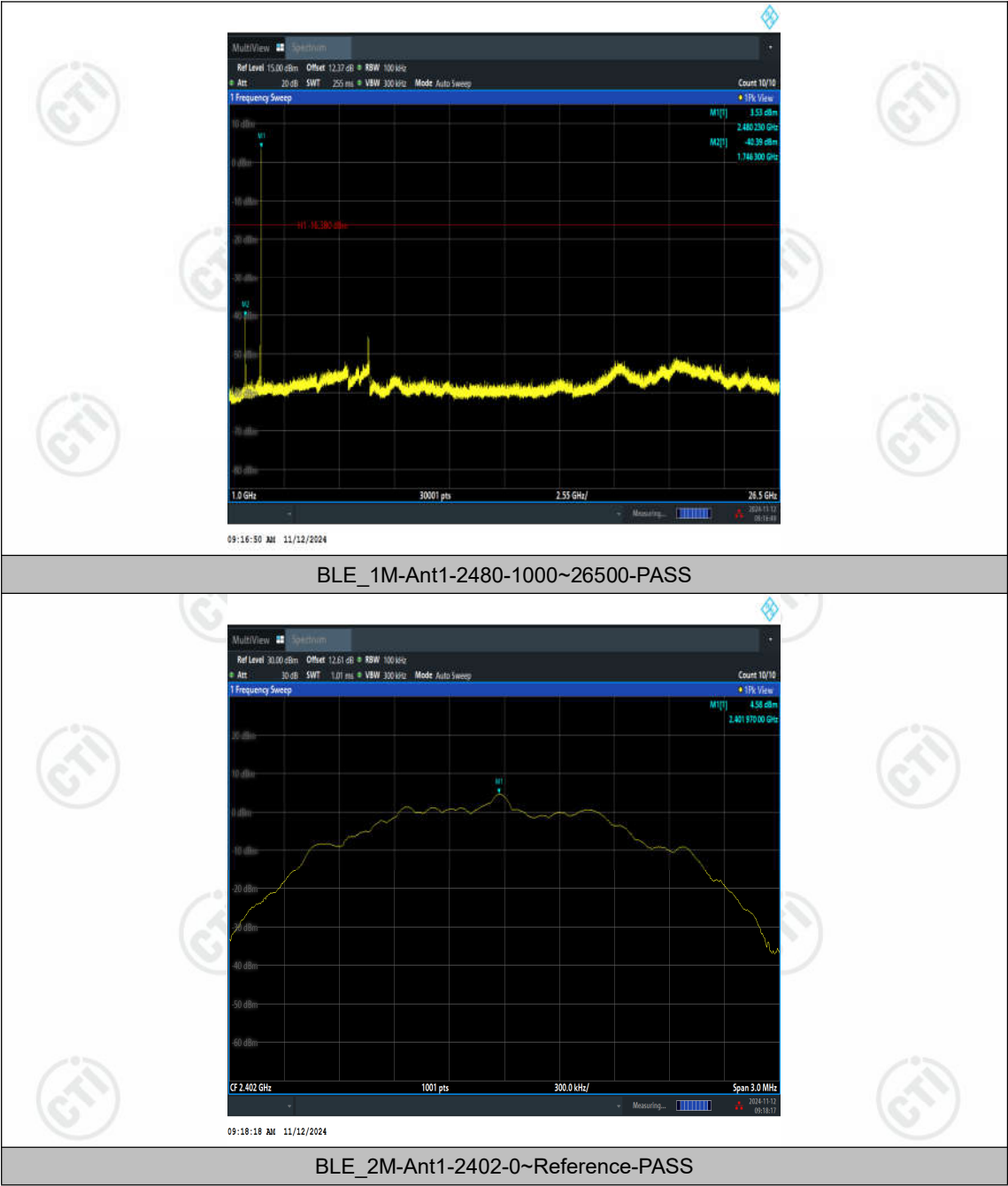


BLE_1M-Ant1-2440-30~1000-PASS



BLE_1M-Ant1-2440-1000~26500-PASS



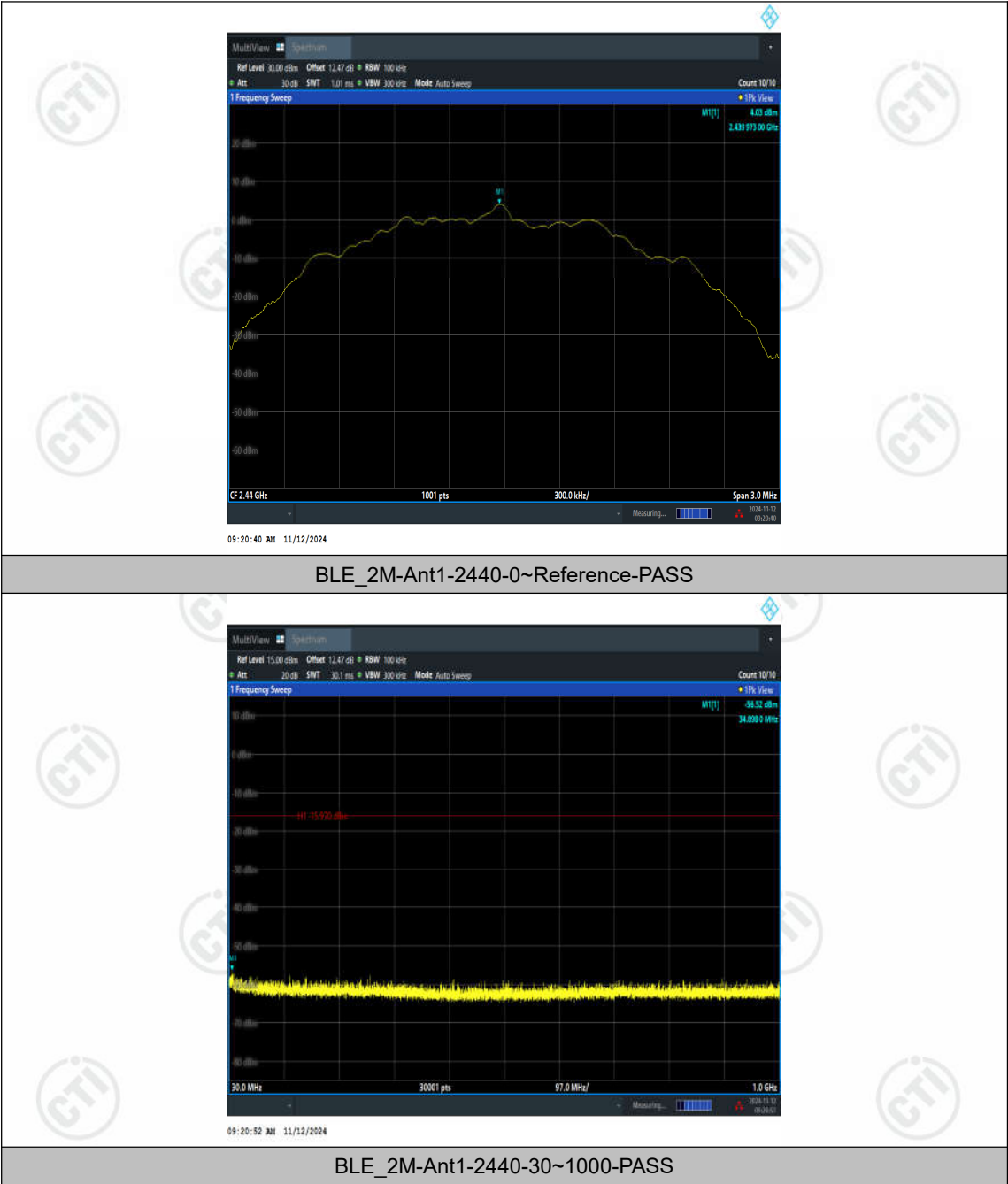




BLE_2M-Ant1-2402-30~1000-PASS

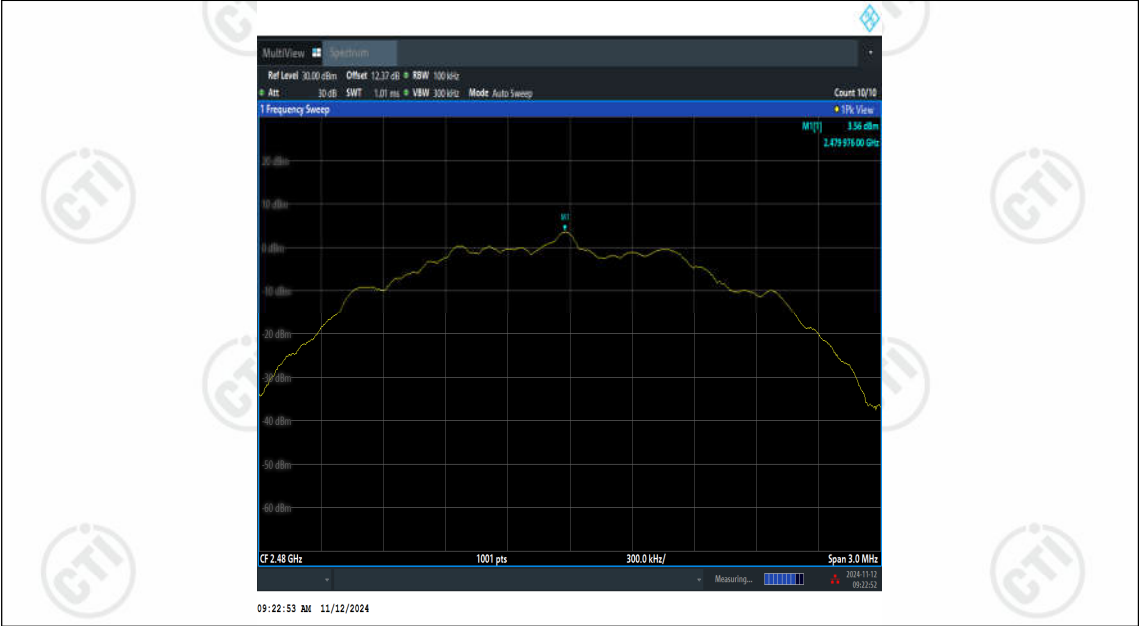


BLE_2M-Ant1-2402-1000~26500-PASS

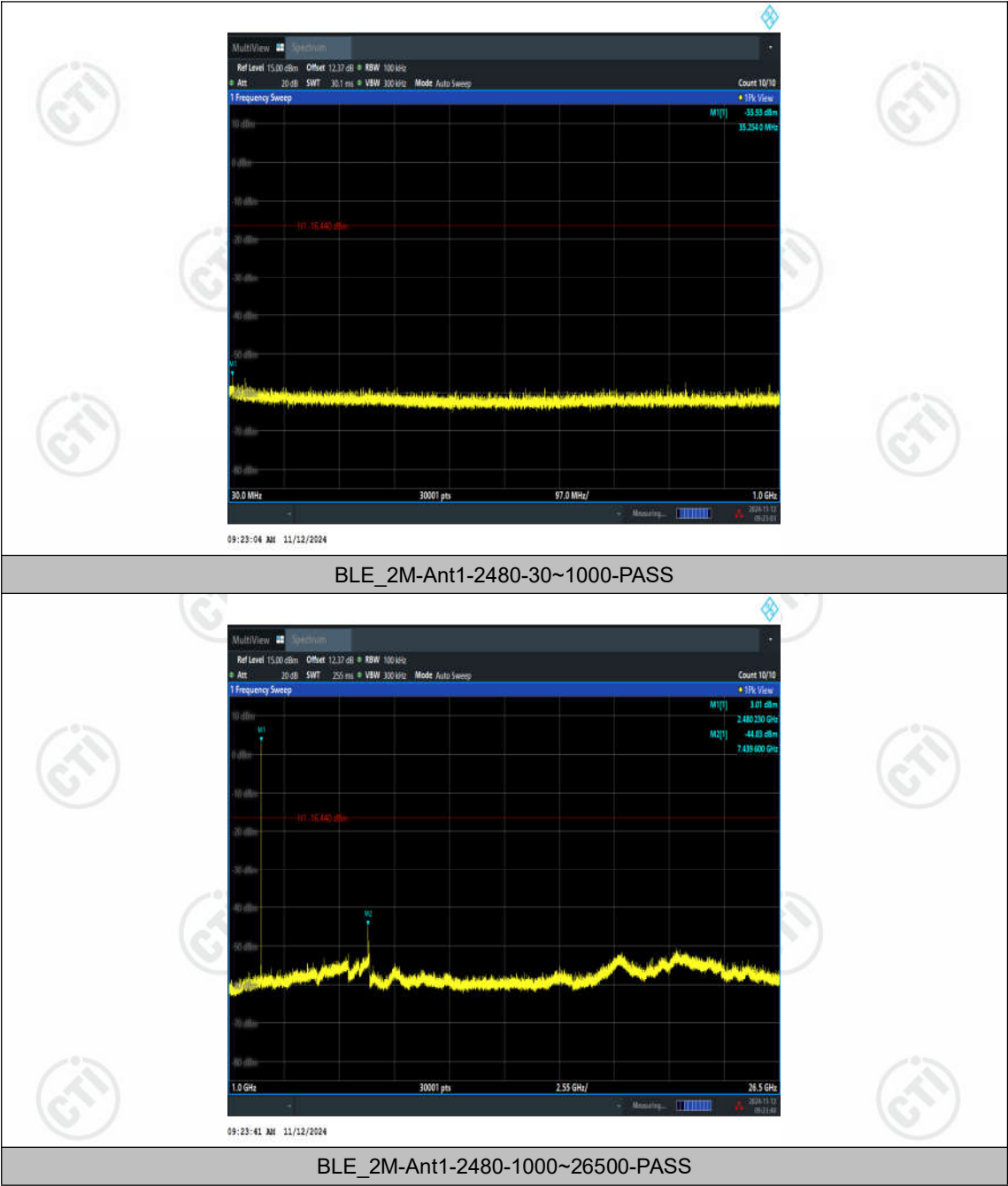




BLE_2M-Ant1-2440-1000~26500-PASS



BLE_2M-Ant1-2480-0~Reference-PASS



Appendix G: Duty Cycle

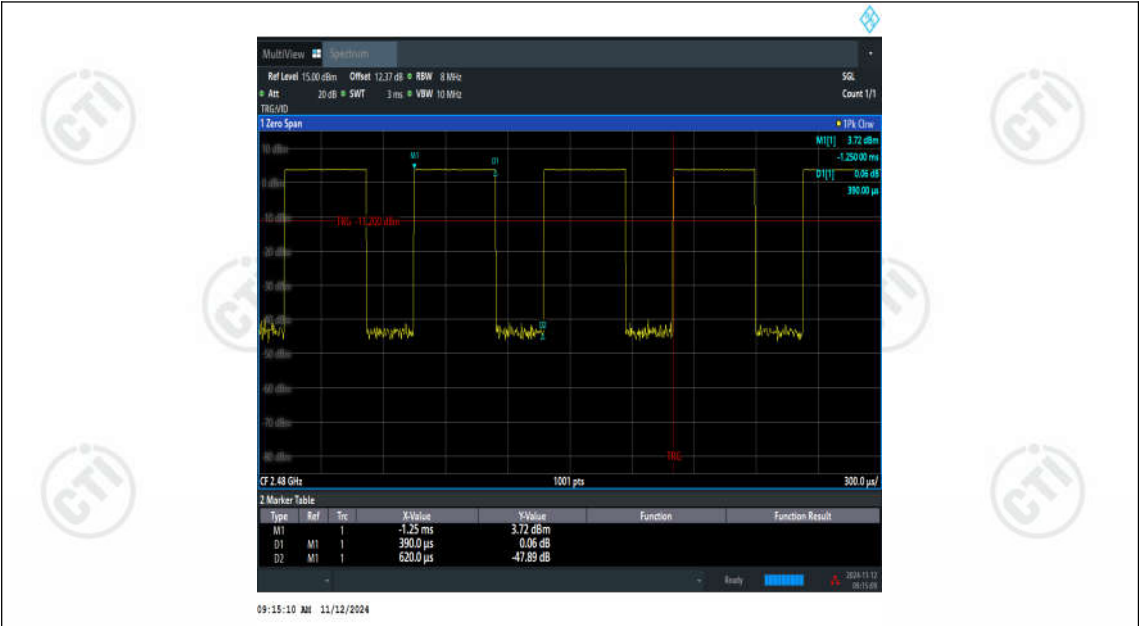
Test Result

Test Mode	Antenna	Frequency [MHz]	ON Time [ms]	Period [ms]	Duty Cycle [%]	Duty Cycle Factor [dB]
BLE_1M	Ant1	2402	0.40	0.63	63.49	1.97
BLE_1M	Ant1	2440	0.39	0.62	62.90	2.01
BLE_1M	Ant1	2480	0.39	0.62	62.90	2.01
BLE_2M	Ant1	2402	0.21	0.63	33.33	4.77
BLE_2M	Ant1	2440	0.21	0.63	33.33	4.77
BLE_2M	Ant1	2480	0.21	0.63	33.33	4.77

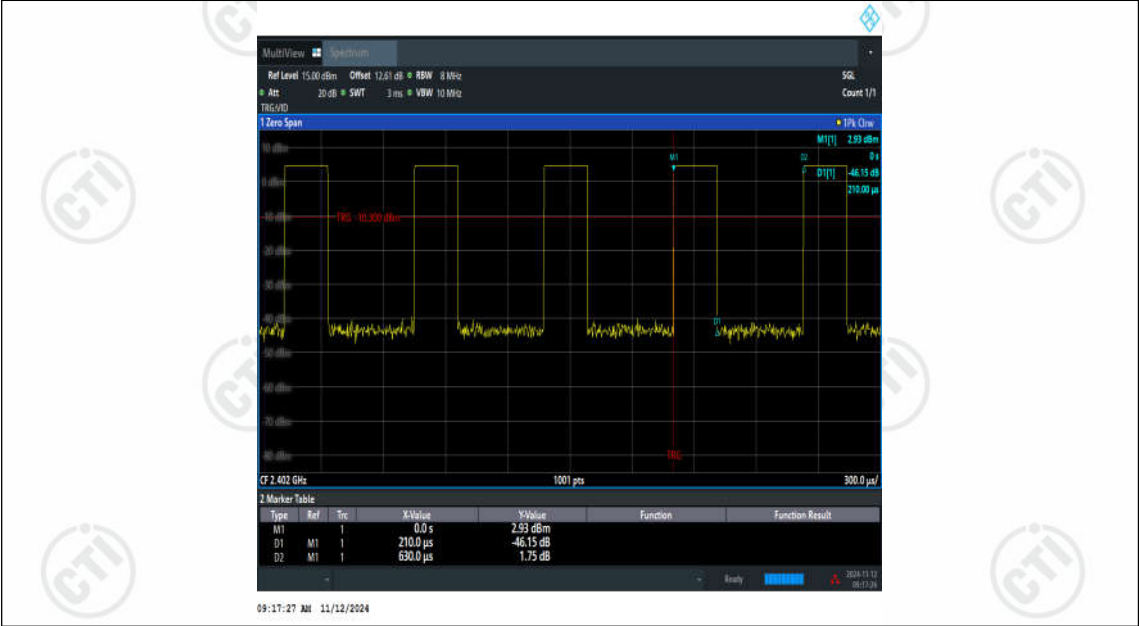
Note:Duty Cycle Factor[dB]=-10*Ig(Duty Cycle);

Test Graphs





NTNV-BLE_1M-Ant1-2480



NTNV-BLE_2M-Ant1-2402



END OF REPORT