Appendix: Bluetooth LE

Contents

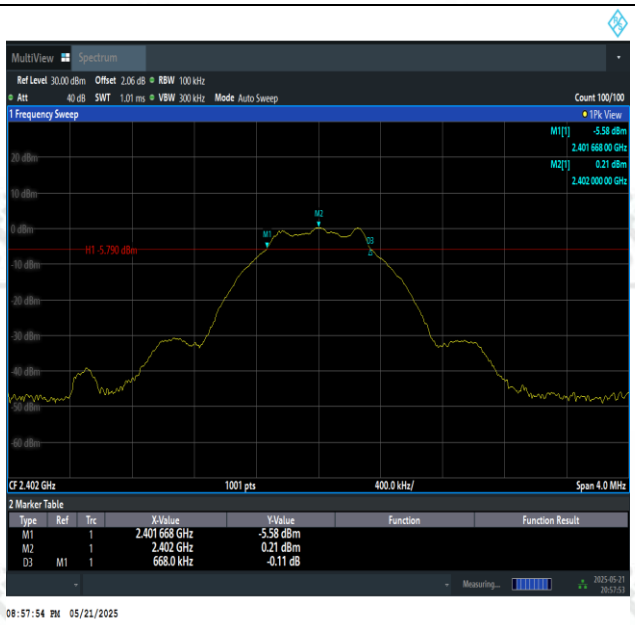
Appendix A: DTS Bandwidth 3
Test Result 3
Test Graphs 4
Appendix B: Occupied Channel Bandwidth 7
Test Result 7
Test Graphs 8
Appendix C: Maximum conducted output power 11
Test Result Peak 11
Test Graphs Peak 12
Appendix D: Maximum power spectral density 15
Test Result 15
Test Graphs 16
Appendix E: Band 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

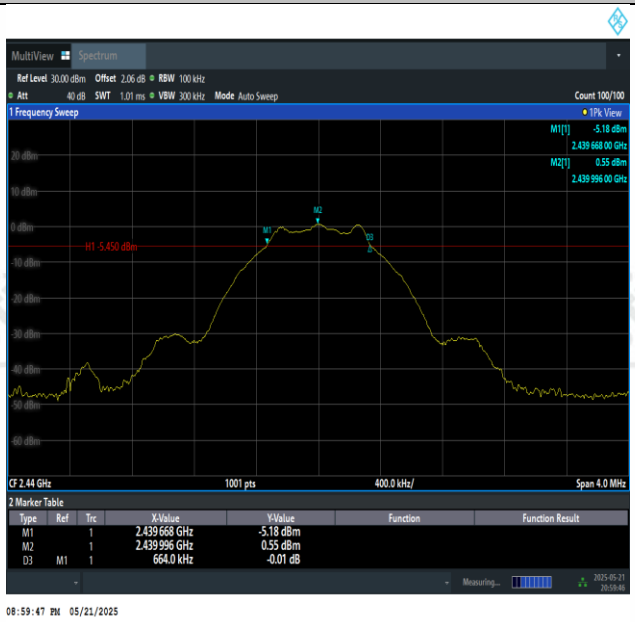
Test Result

TestMode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.67	2401.67	2402.34	0.5	PASS
BLE_1M	Ant1	2440	0.66	2439.67	2440.33	0.5	PASS
BLE_1M	Ant1	2480	0.67	2479.66	2480.33	0.5	PASS
BLE_2M	Ant1	2402	1.15	2401.43	2402.58	0.5	PASS
BLE_2M	Ant1	2440	1.15	2439.44	2440.58	0.5	PASS
BLE_2M	Ant1	2480	1.14	2479.44	2480.58	0.5	PASS

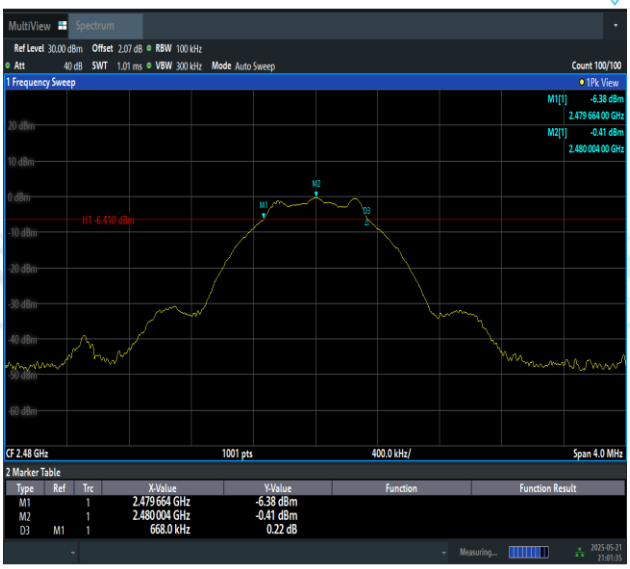
Test Graphs



BLE_1M-Ant1-2402-PASS

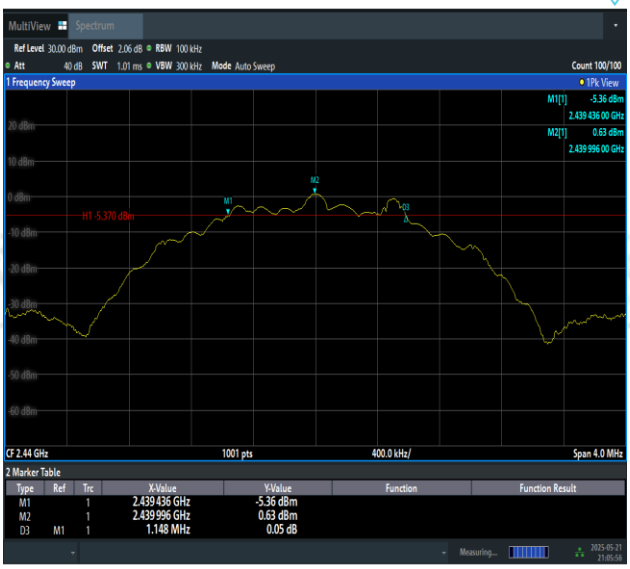


BLE_1M-Ant1-2440-PASS



BLE_1M-Ant1-2480-PASS

BLE_2M-Ant1-2402-PASS



BLE_2M-Ant1-2440-PASS

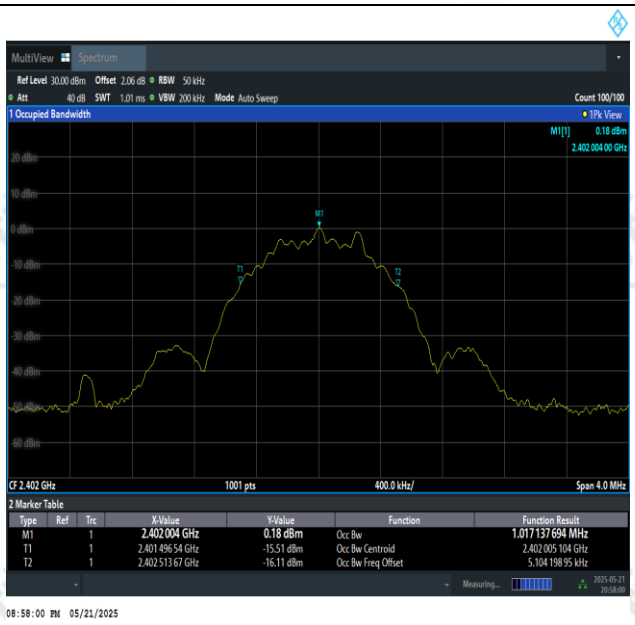
BLE_2M-Ant1-2480-PASS

Appendix B: Occupied Channel Bandwidth

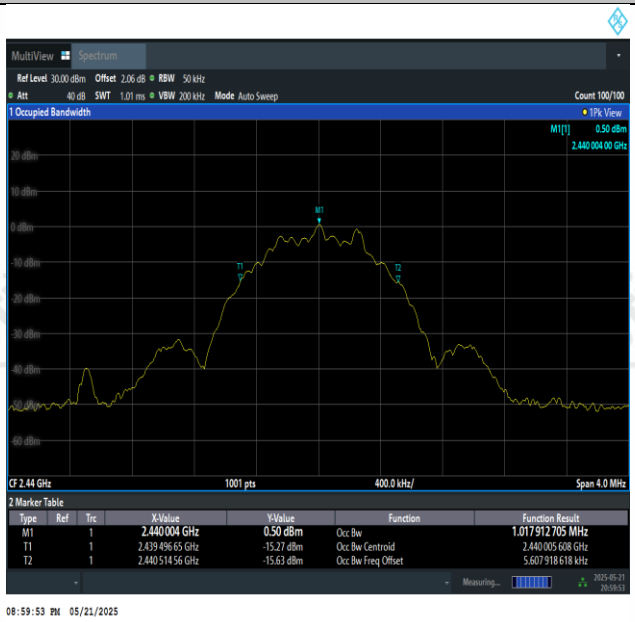
Test Result

Test Mode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit [MHz]	Verdict
BLE_1M	Ant1	2402	1.017	2401.4965	2402.5137	---	---
BLE_1M	Ant1	2440	1.018	2439.4967	2440.5146	---	---
BLE_1M	Ant1	2480	1.018	2479.4969	2480.5149	---	---
BLE_2M	Ant1	2402	2.027	2401.0007	2403.0274	---	---
BLE_2M	Ant1	2440	2.022	2439.0002	2441.0219	---	---
BLE_2M	Ant1	2480	2.025	2479.0035	2481.0281	---	---

Test Graphs



BLE_1M-Ant1-2402



BLE_1M-Ant1-2440

BLE_1M-Ant1-2480

BLE_2M-Ant1-2402

BLE_2M-Ant1-2440

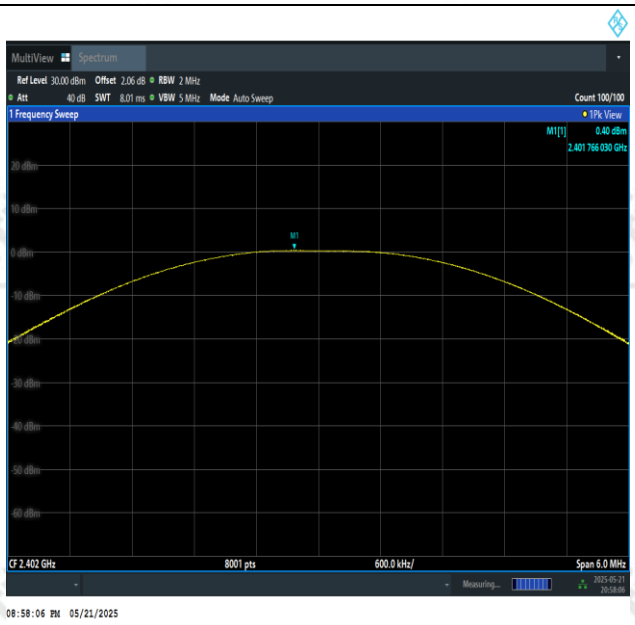
BLE_2M-Ant1-2480

Appendix C: Maximum conducted output power

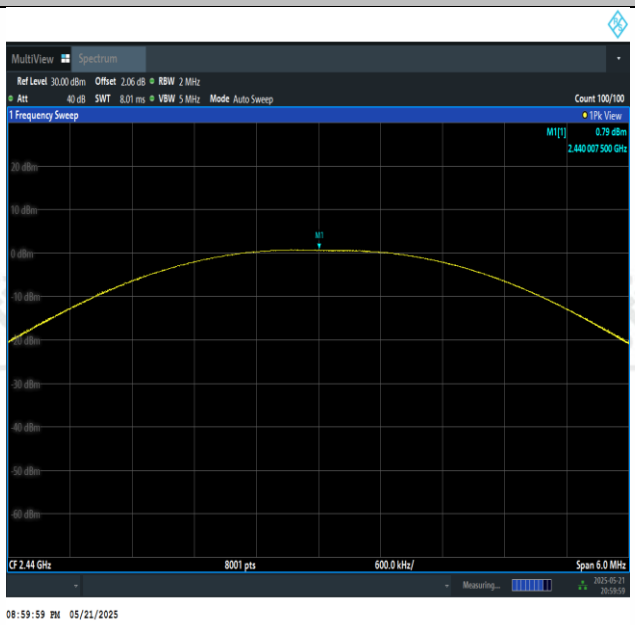
Test Result Peak

TestMode	Antenna	Frequency[MHz]	Conducted Peak Power[dBm]	Conducted Limit[dBm]	Verdict
BLE_1M	Ant1	2402	0.40	≤30	PASS
BLE_1M	Ant1	2440	0.79	≤30	PASS
BLE_1M	Ant1	2480	-0.11	≤30	PASS
BLE_2M	Ant1	2402	0.55	≤30	PASS
BLE_2M	Ant1	2440	0.86	≤30	PASS
BLE_2M	Ant1	2480	-0.01	≤30	PASS

Test Graphs Peak



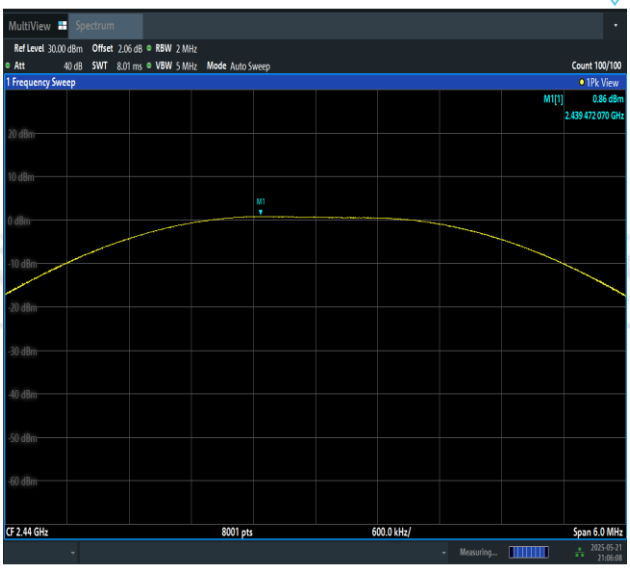
BLE_1M-Ant1-2402-PASS



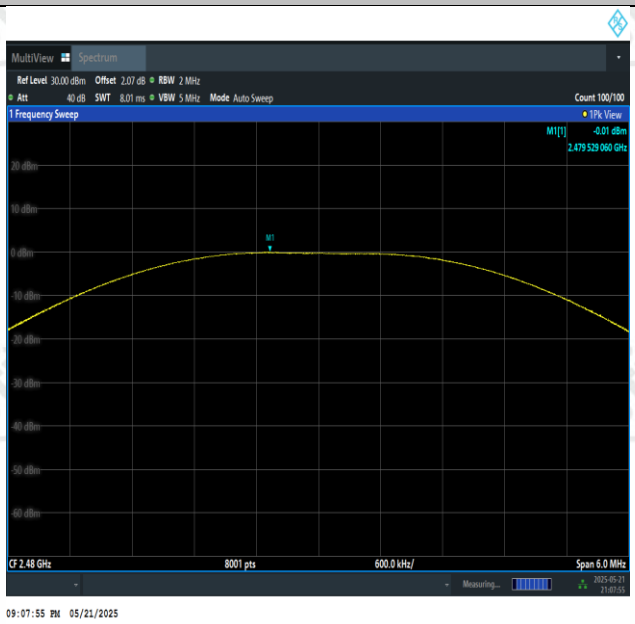
BLE_1M-Ant1-2440-PASS

BLE_1M-Ant1-2480-PASS

BLE_2M-Ant1-2402-PASS



BLE_2M-Ant1-2440-PASS



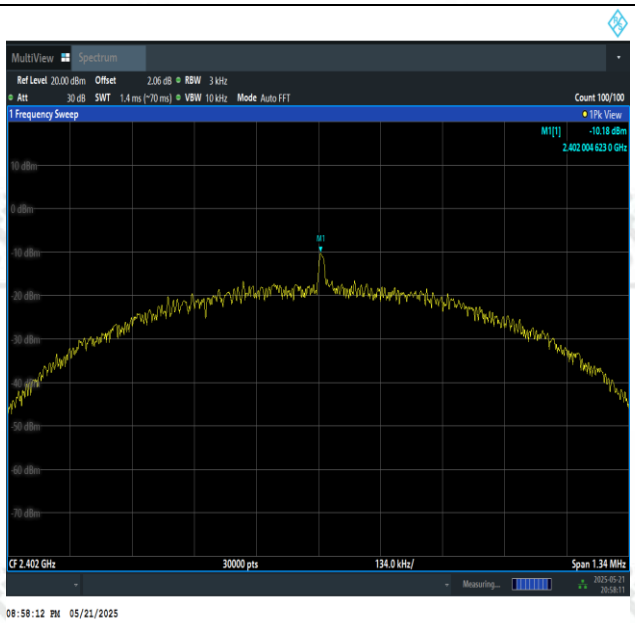
BLE_2M-Ant1-2480-PASS

Appendix D: Maximum power spectral density

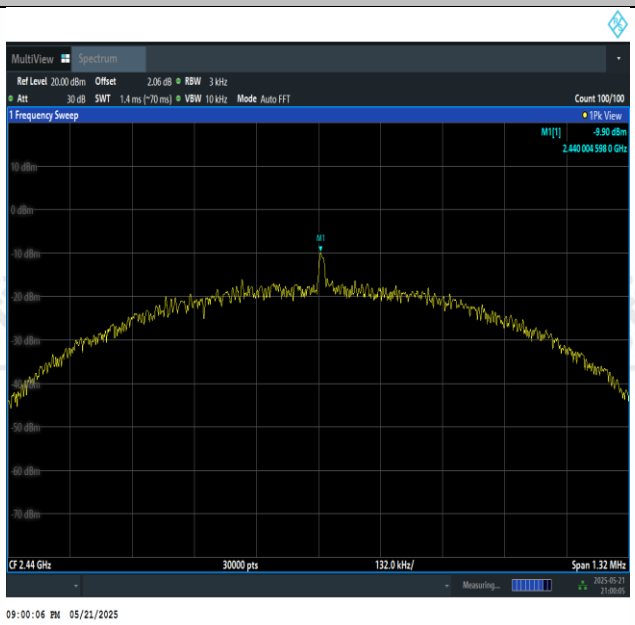
Test Result

TestMode	Antenna	Frequency[MHz]	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-10.18	≤8.00	PASS
BLE_1M	Ant1	2440	-9.90	≤8.00	PASS
BLE_1M	Ant1	2480	-10.96	≤8.00	PASS
BLE_2M	Ant1	2402	-10.87	≤8.00	PASS
BLE_2M	Ant1	2440	-10.64	≤8.00	PASS
BLE_2M	Ant1	2480	-11.55	≤8.00	PASS

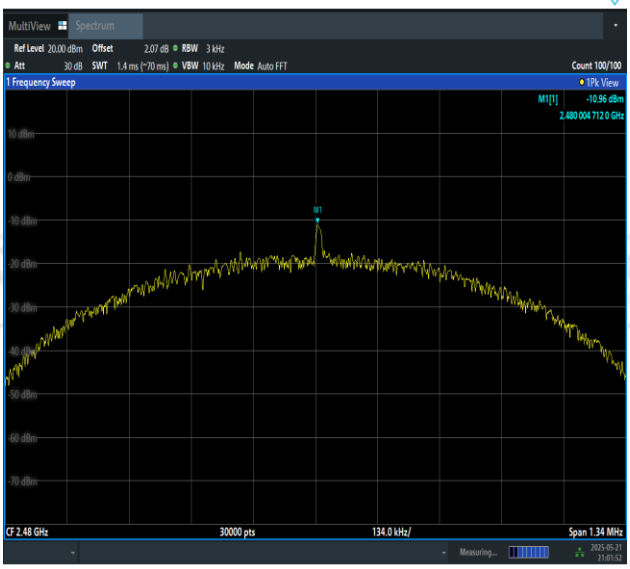
Test Graphs



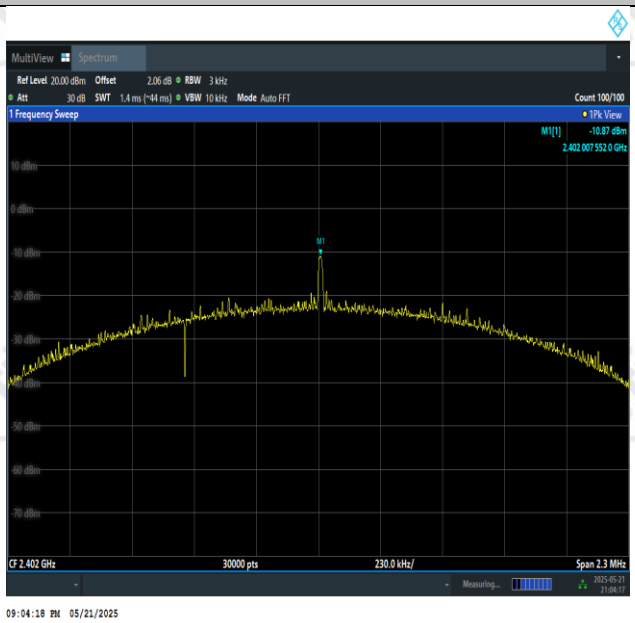
BLE_1M-Ant1-2402-PASS



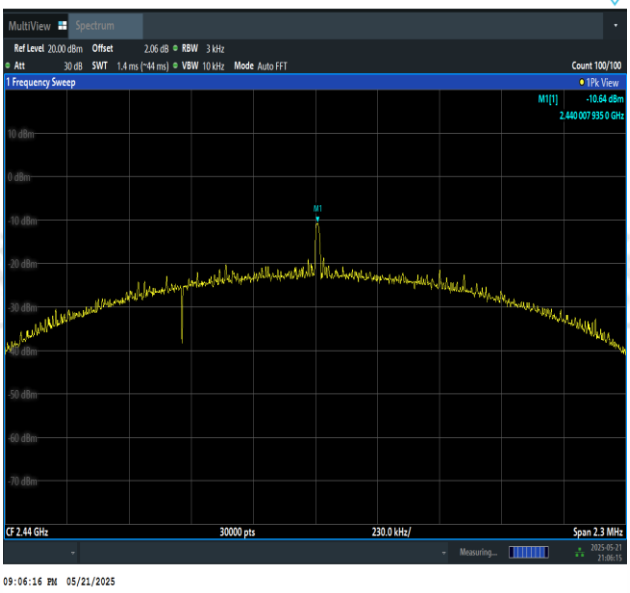
BLE_1M-Ant1-2440-PASS



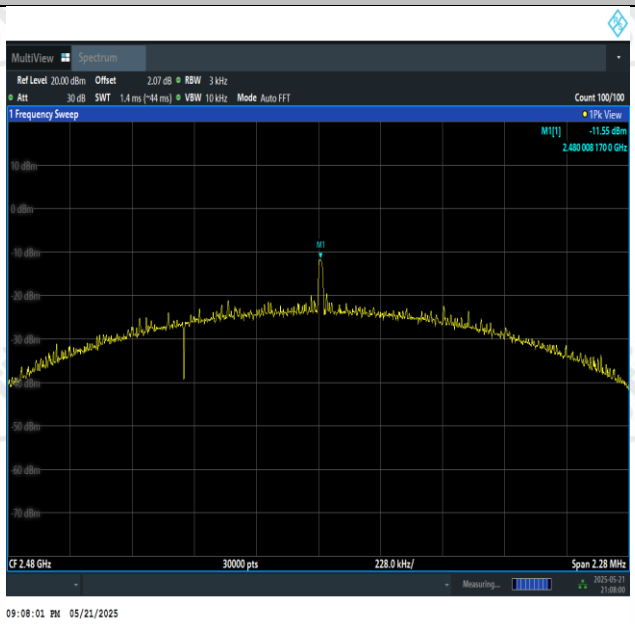
BLE_1M-Ant1-2480-PASS



BLE_2M-Ant1-2402-PASS



BLE_2M-Ant1-2440-PASS



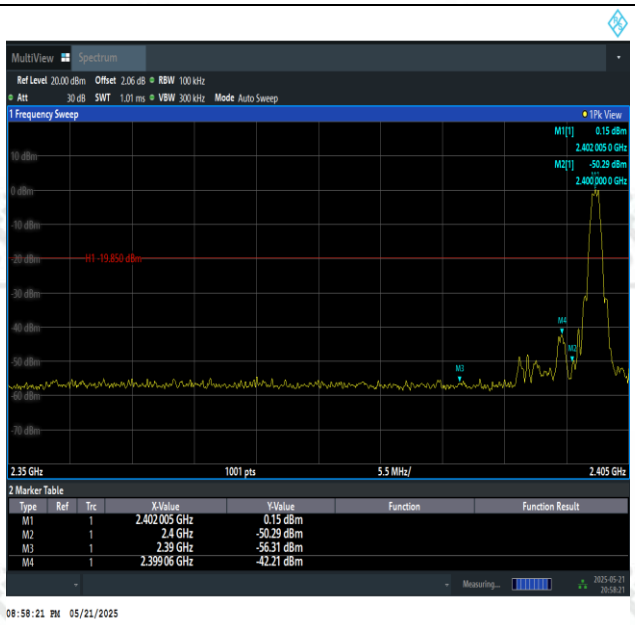
BLE_2M-Ant1-2480-PASS

Appendix E: Band edge measurements

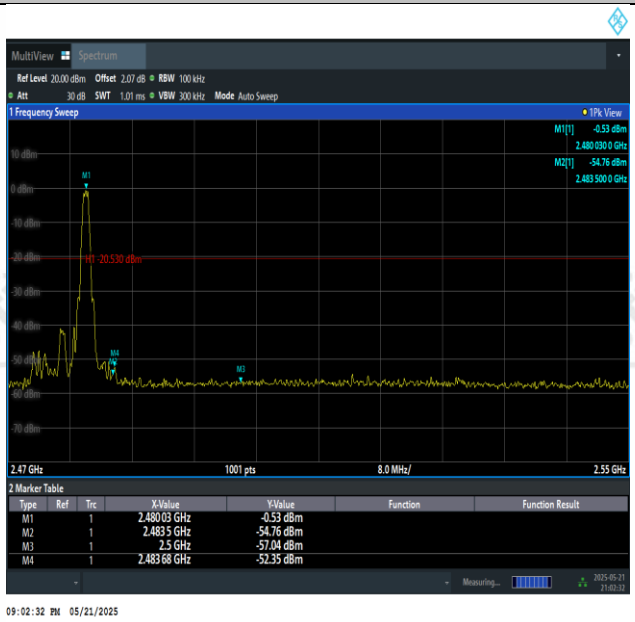
Test Result

TestMode	Antenna	ChName	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	0.15	-42.21	≤-19.85	PASS
BLE_1M	Ant1	High	2480	-0.53	-52.35	≤-20.53	PASS
BLE_2M	Ant1	Low	2402	0.24	-32.99	≤-19.76	PASS
BLE_2M	Ant1	High	2480	-0.44	-54.25	≤-20.44	PASS

Test Graphs



BLE_1M-Ant1-2402-PASS



BLE_1M-Ant1-2480-PASS

BLE_2M-Ant1-2402-PASS

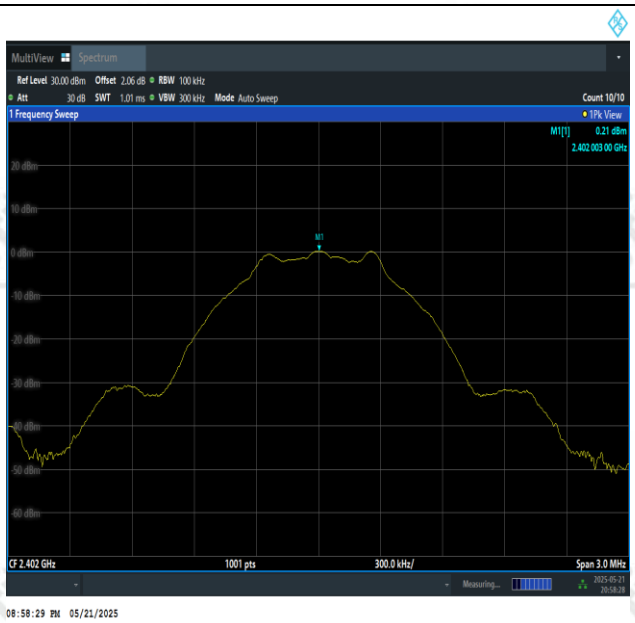
BLE_2M-Ant1-2480-PASS

Appendix F: Conducted Spurious Emission

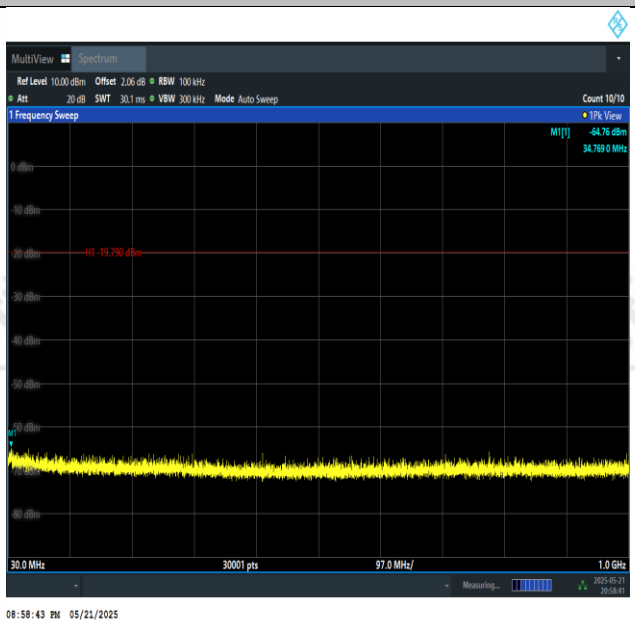
Test Result

TestMode	Antenna	Frequency [MHz]	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	0~Reference	0.21	0.21	---	PASS
BLE_1M	Ant1	2402	30~1000	0.21	-64.76	≤-19.79	PASS
BLE_1M	Ant1	2402	1000~26500	0.21	-45.84	≤-19.79	PASS
BLE_1M	Ant1	2440	0~Reference	0.49	0.49	---	PASS
BLE_1M	Ant1	2440	30~1000	0.49	-64.41	≤-19.51	PASS
BLE_1M	Ant1	2440	1000~26500	0.49	-44.54	≤-19.51	PASS
BLE_1M	Ant1	2480	0~Reference	-0.52	-0.52	---	PASS
BLE_1M	Ant1	2480	30~1000	-0.52	-64.56	≤-20.52	PASS
BLE_1M	Ant1	2480	1000~26500	-0.52	-42.03	≤-20.52	PASS
BLE_2M	Ant1	2402	0~Reference	0.27	0.27	---	PASS
BLE_2M	Ant1	2402	30~1000	0.27	-64.73	≤-19.73	PASS
BLE_2M	Ant1	2402	1000~26500	0.27	-46.05	≤-19.73	PASS
BLE_2M	Ant1	2440	0~Reference	0.56	0.56	---	PASS
BLE_2M	Ant1	2440	30~1000	0.56	-64.95	≤-19.44	PASS
BLE_2M	Ant1	2440	1000~26500	0.56	-44.52	≤-19.44	PASS
BLE_2M	Ant1	2480	0~Reference	-0.42	-0.42	---	PASS
BLE_2M	Ant1	2480	30~1000	-0.42	-64.58	≤-20.42	PASS
BLE_2M	Ant1	2480	1000~26500	-0.42	-42.27	≤-20.42	PASS

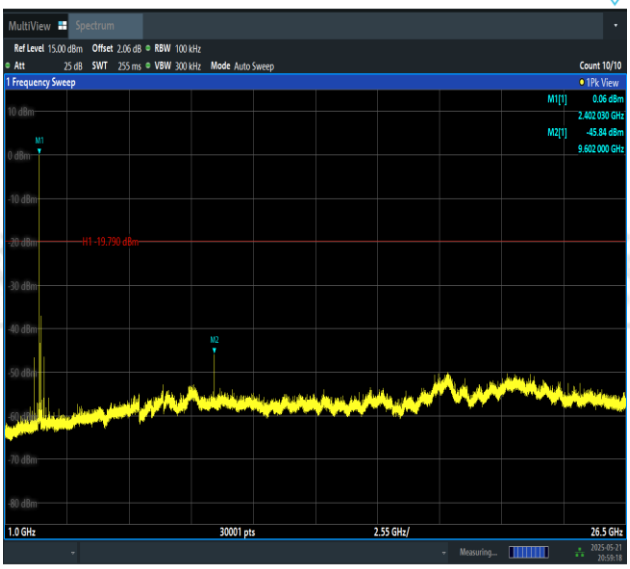
Test Graphs



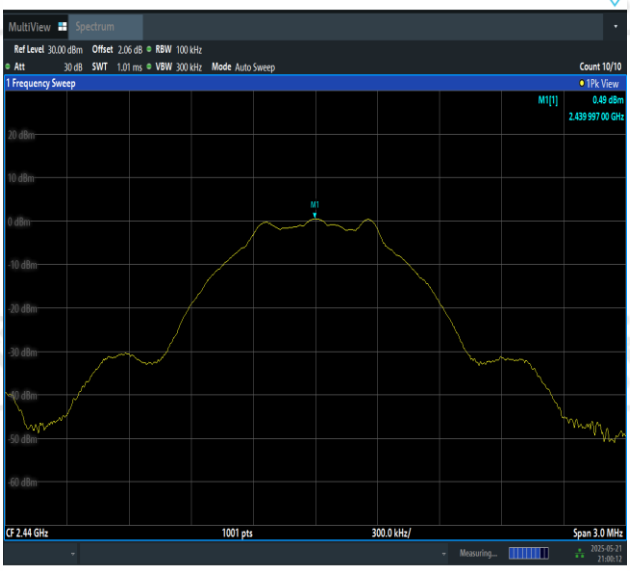
BLE_1M-Ant1-2402-0~Reference-PASS



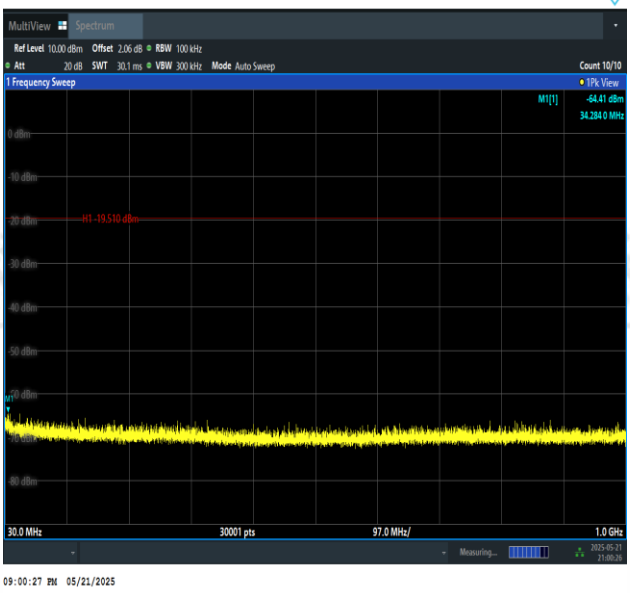
BLE_1M-Ant1-2402-30~1000-PASS



BLE_1M-Ant1-2402-1000~26500-PASS

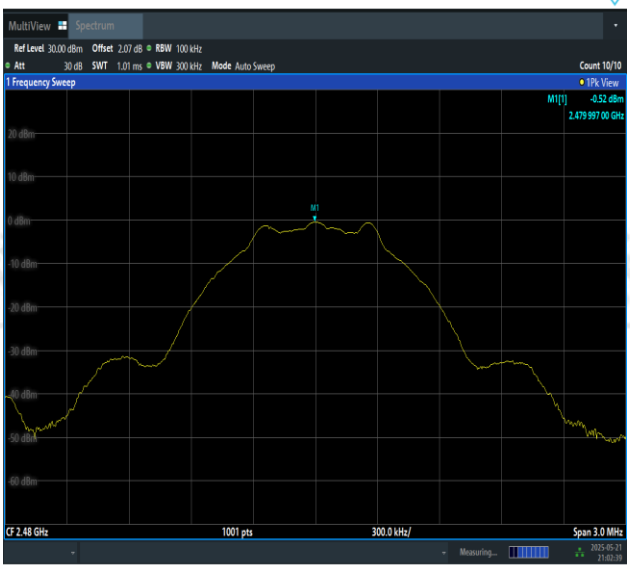


BLE_1M-Ant1-2440-0~Reference-PASS

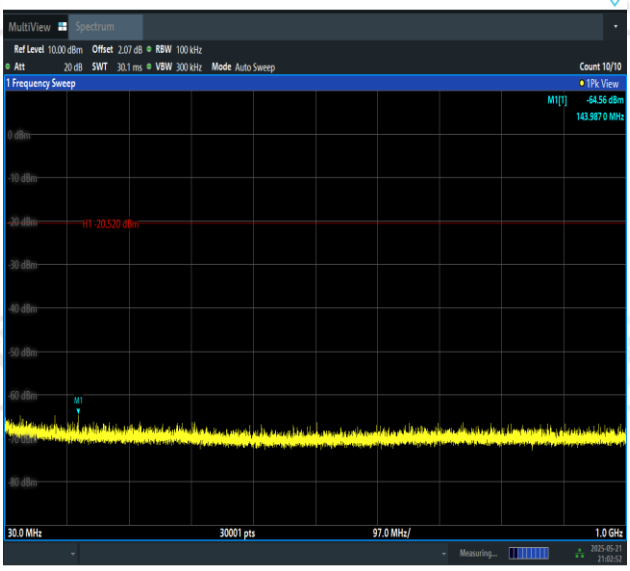


BLE_1M-Ant1-2440-30~1000-PASS

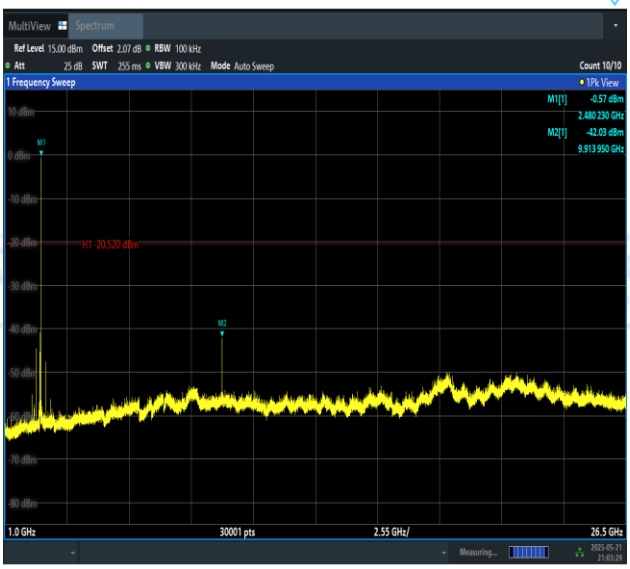
BLE_1M-Ant1-2440-1000~26500-PASS



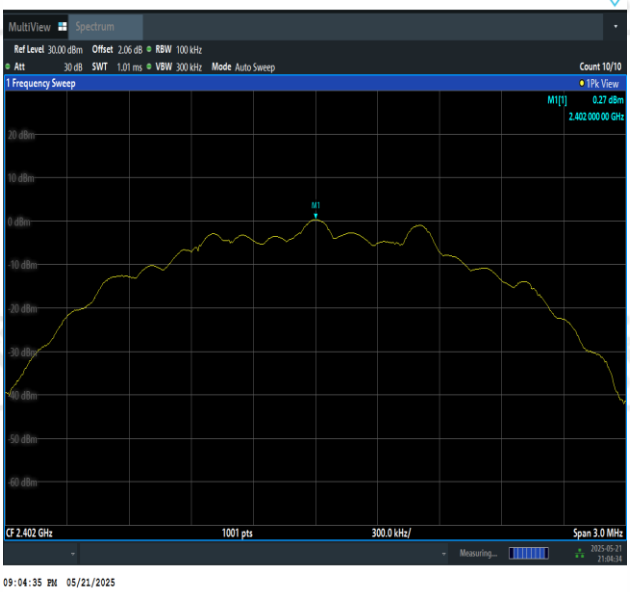
BLE_1M-Ant1-2480-0~Reference-PASS



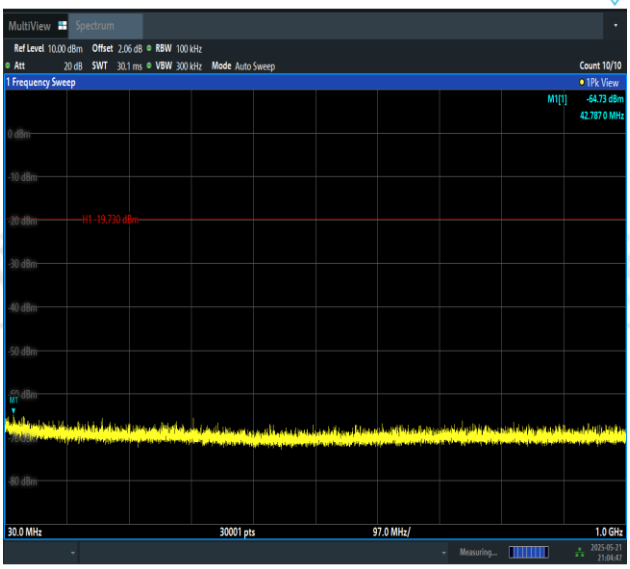
BLE_1M-Ant1-2480-30~1000-PASS



BLE_1M-Ant1-2480-1000~26500-PASS

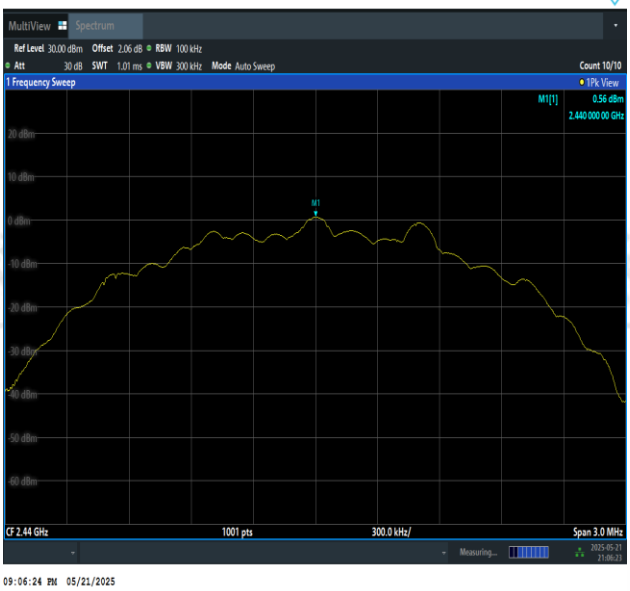


BLE_2M-Ant1-2402-0~Reference-PASS

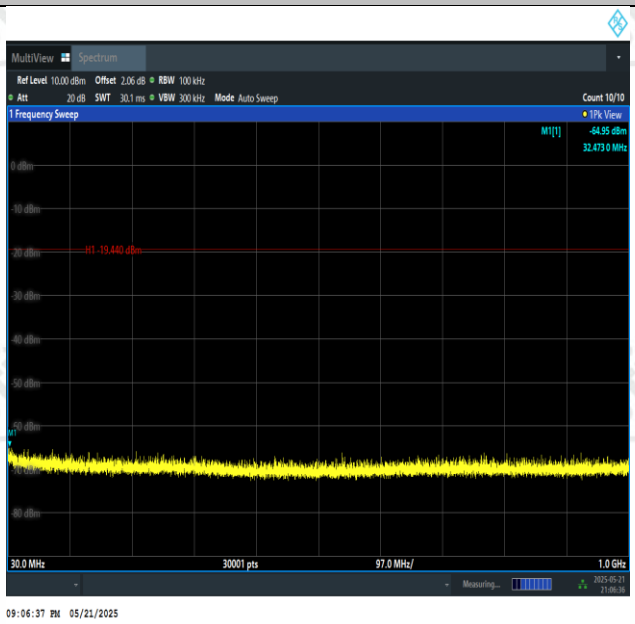


BLE_2M-Ant1-2402-30~1000-PASS

BLE_2M-Ant1-2402-1000~26500-PASS

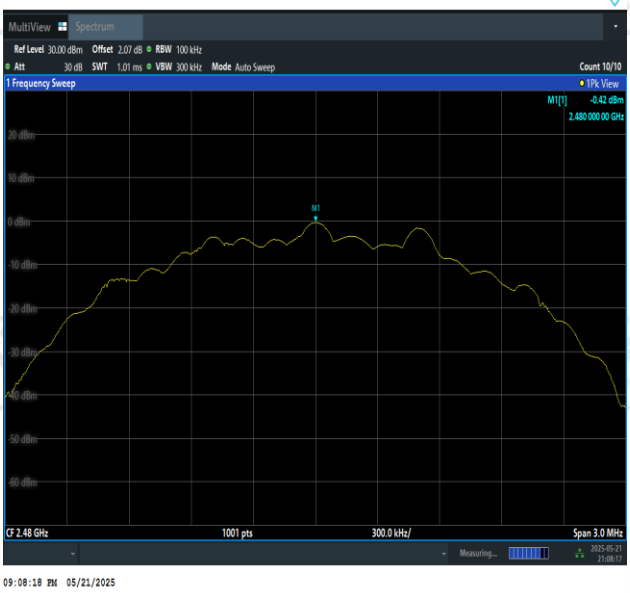


BLE_2M-Ant1-2440-0~Reference-PASS

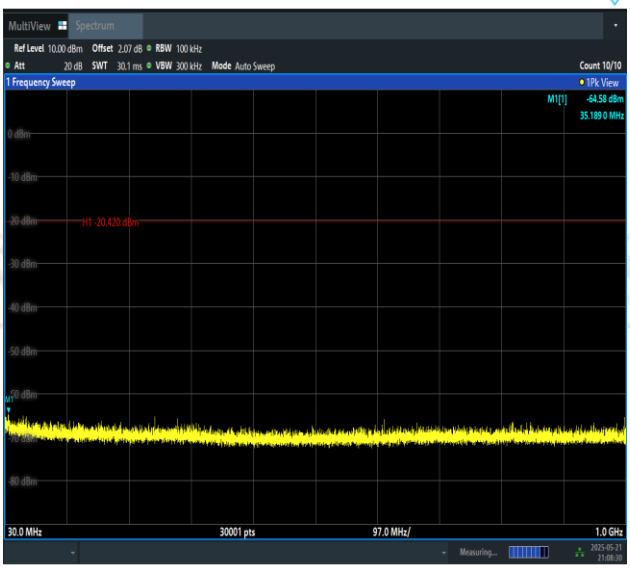


BLE_2M-Ant1-2440-30~1000-PASS

BLE_2M-Ant1-2440-1000~26500-PASS



BLE_2M-Ant1-2480-0~Reference-PASS



BLE_2M-Ant1-2480-30~1000-PASS

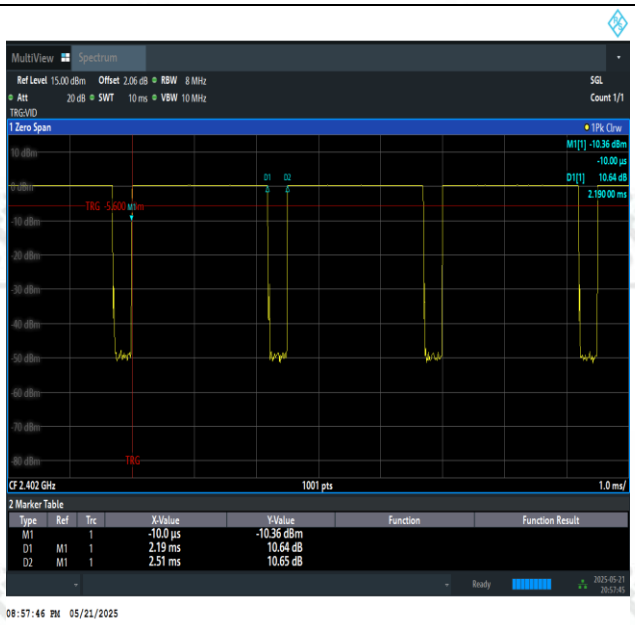
BLE_2M-Ant1-2480-1000~26500-PASS

Appendix G: Duty Cycle

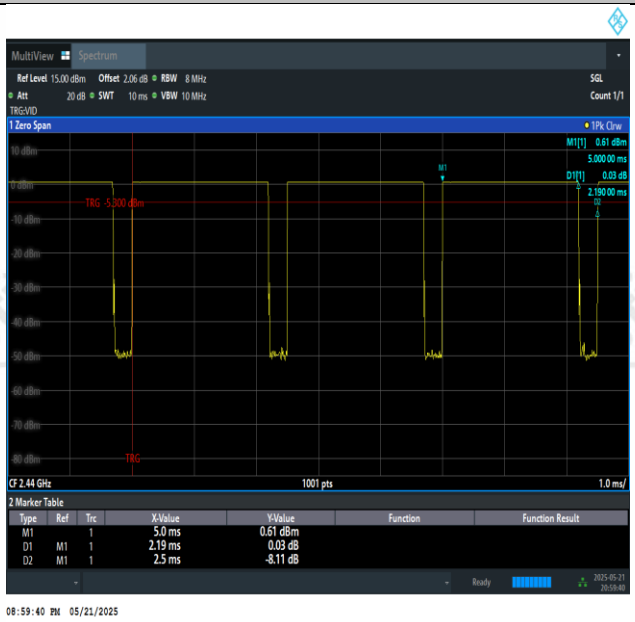
Test Result

TestMode	Antenna	Frequency[MHz]	ON Time [ms]	Period [ms]	Duty Cycle [%]	Duty Cycle Factor[dB]
BLE_1M	Ant1	2402	2.19	2.51	87.25	0.59
BLE_1M	Ant1	2440	2.19	2.50	87.60	0.57
BLE_1M	Ant1	2480	2.19	2.51	87.25	0.59
BLE_2M	Ant1	2402	1.13	2.50	45.20	3.45
BLE_2M	Ant1	2440	1.13	2.50	45.20	3.45
BLE_2M	Ant1	2480	1.13	2.50	45.20	3.45

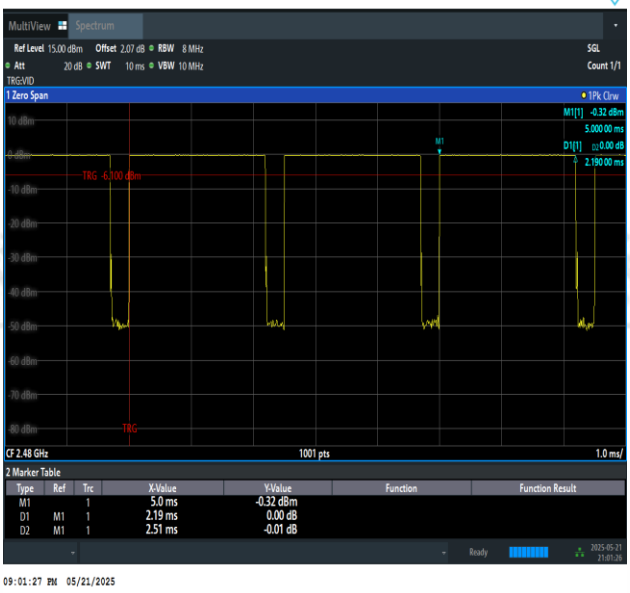
Test Graphs



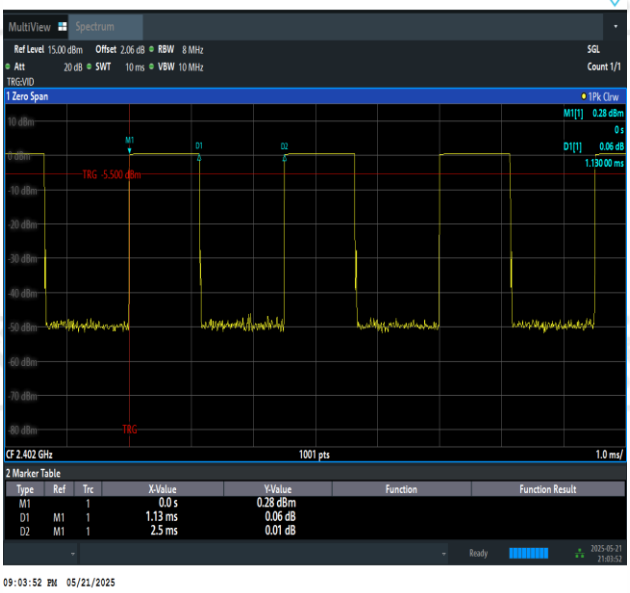
NTNV-BLE_1M-Ant1-2402



NTNV-BLE_1M-Ant1-2440

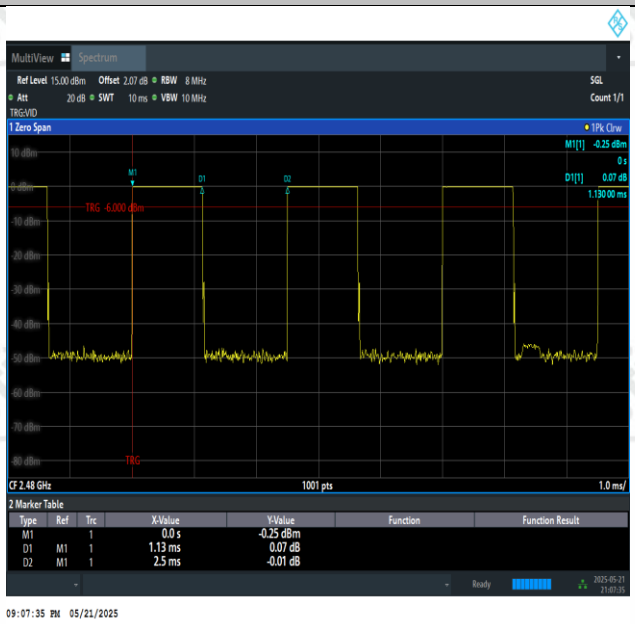


NTNV-BLE_1M-Ant1-2480



NTNV-BLE_2M-Ant1-2402

NTNV-BLE_2M-Ant1-2440



NTNV-BLE_2M-Ant1-2480

*** End of Report ***