RF Test Data for Bluetooth LE (Conducted Measurements)

General Description of EUT	
Product Name:	SmartWatch
Test Model:	T3MAX
Sample ID:	202307-0081-1-2#
Environmental Conditions	
Temperature:	25℃
Relative Humidity:	55%
Test Voltage:	DC 3.7V
Test Engineer:	Huang jian ping
Note: For a more detailed features description, please refer to the report TBR-C-202307-0081-3 The report only show the worst case data.	

Contents

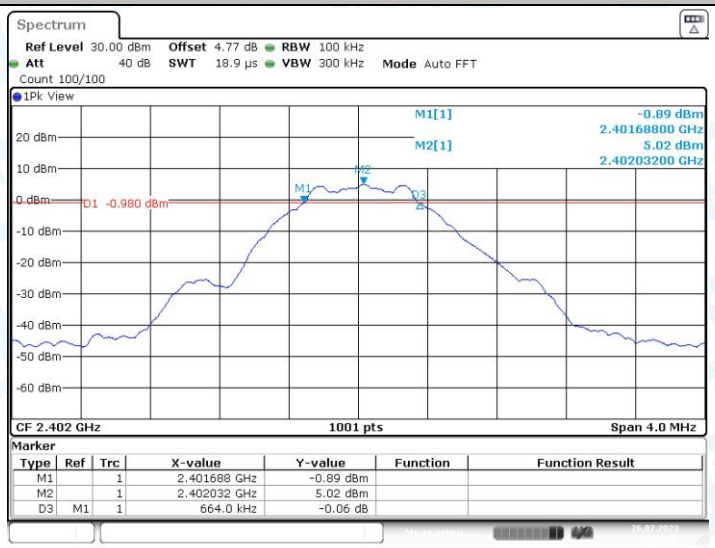
1. -6dB Bandwidth

1.1.Test Result

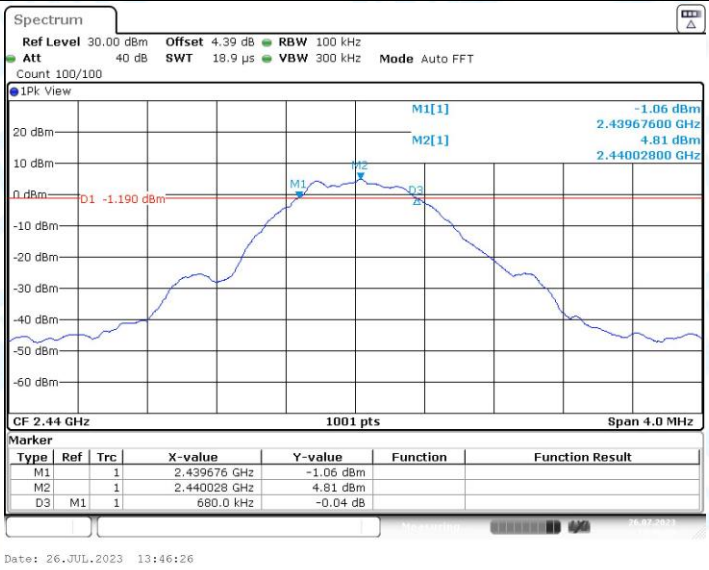
Test Mode	Antenna	Channel	-6dB BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.66	2401.69	2402.35	0.5	PASS
		2440	0.68	2439.68	2440.36	0.5	PASS
		2480	0.66	2479.69	2480.35	0.5	PASS
BLE_2M	Ant1	2402	1.11	2401.46	2402.57	0.5	PASS
		2440	1.09	2439.49	2440.58	0.5	PASS
		2480	0.96	2479.46	2480.42	0.5	PASS

1.2.Test Graphs

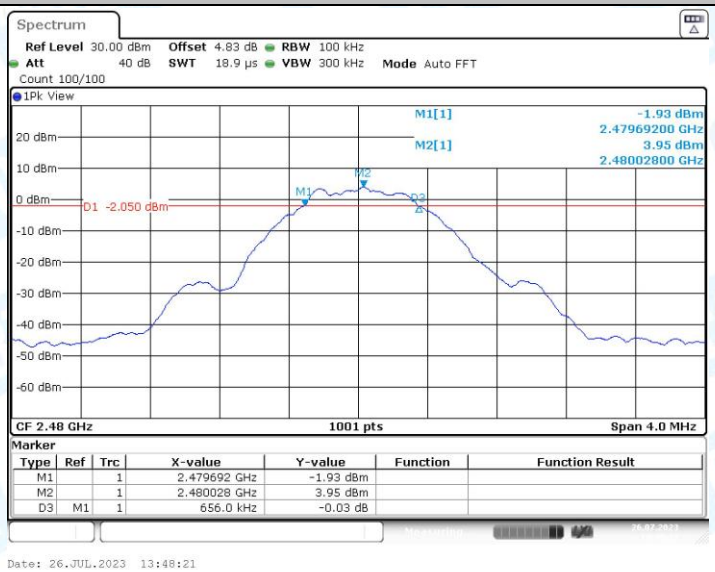
BLE_1M_Ant1_2402



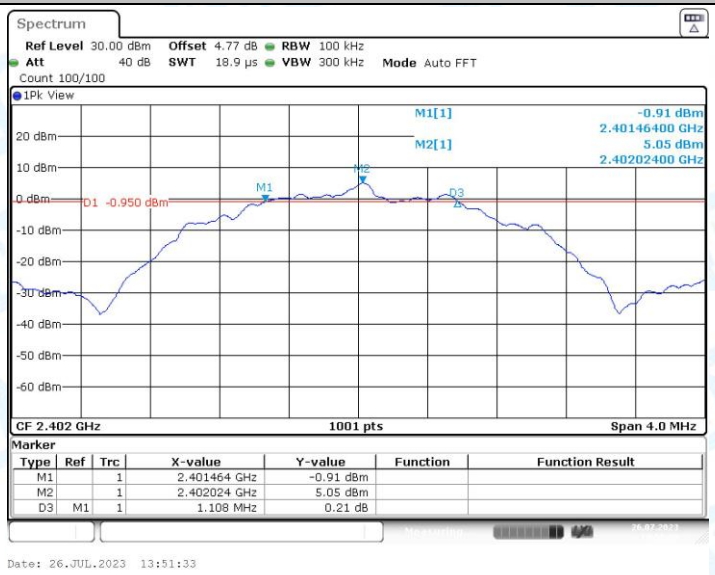
BLE_1M_Ant1_2440



BLE_1M_Ant1_2480

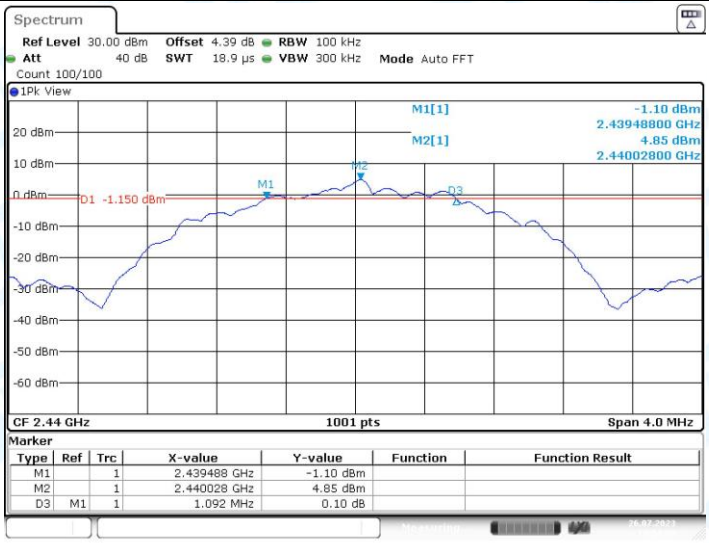


BLE_2M_Ant1_2402



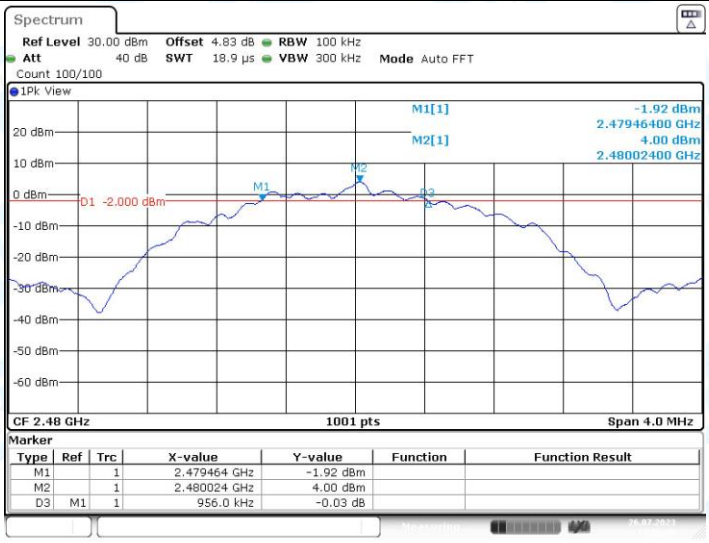
Date: 26.JUL.2023 13:51:33

BLE_2M_Ant1_2440



Date: 26.JUL.2023 13:54:39

BLE_2M_Ant1_2480



Date: 26.JUL.2023 13:56:39

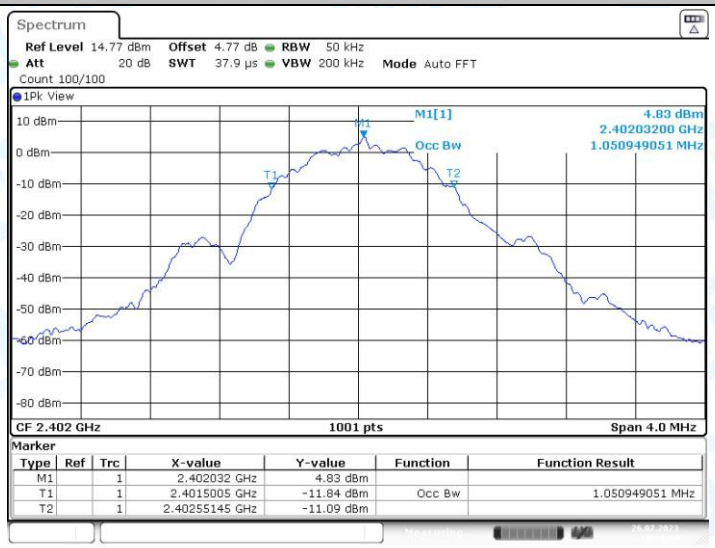
2. Occupied Channel Bandwidth

2.1.Test Result

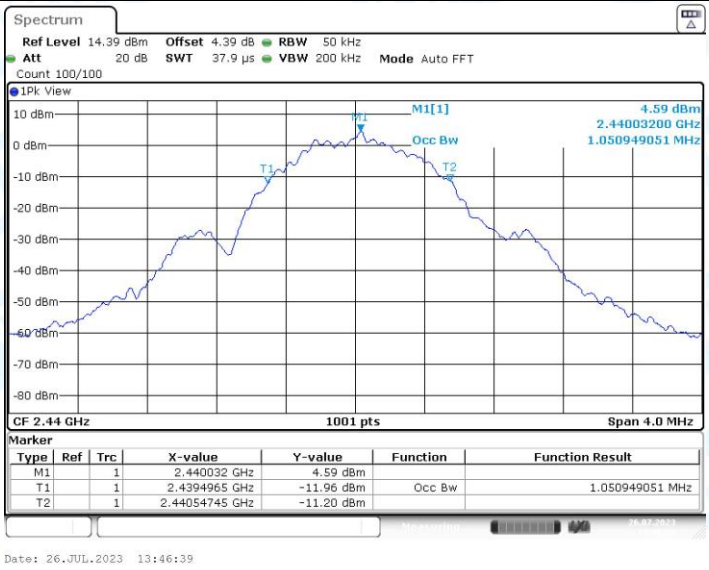
Test Mode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	1.051	2401.5005	2402.5514	---	---
		2440	1.051	2439.4965	2440.5475	---	---
		2480	1.055	2479.4965	2480.5514	---	---
BLE_2M	Ant1	2402	2.058	2401.0050	2403.0629	---	---
		2440	2.07	2438.9970	2441.0669	---	---
		2480	2.058	2479.0050	2481.0629	---	---

2.2.Test Graphs

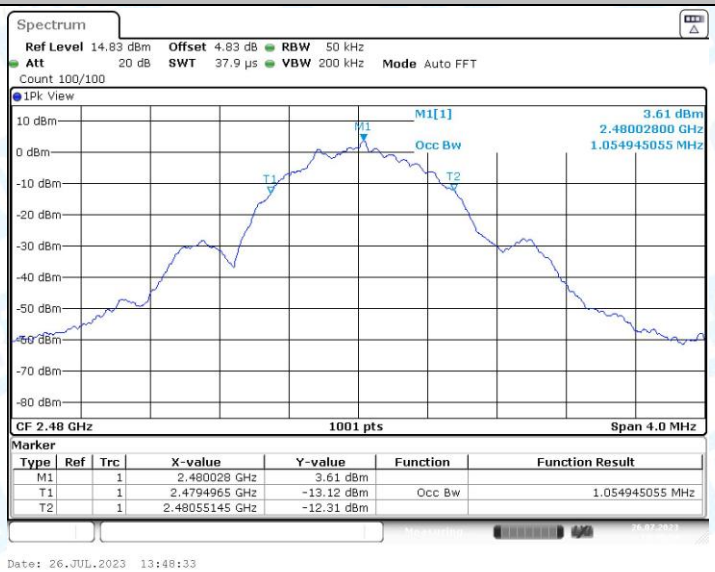
BLE_1M_Ant1_2402



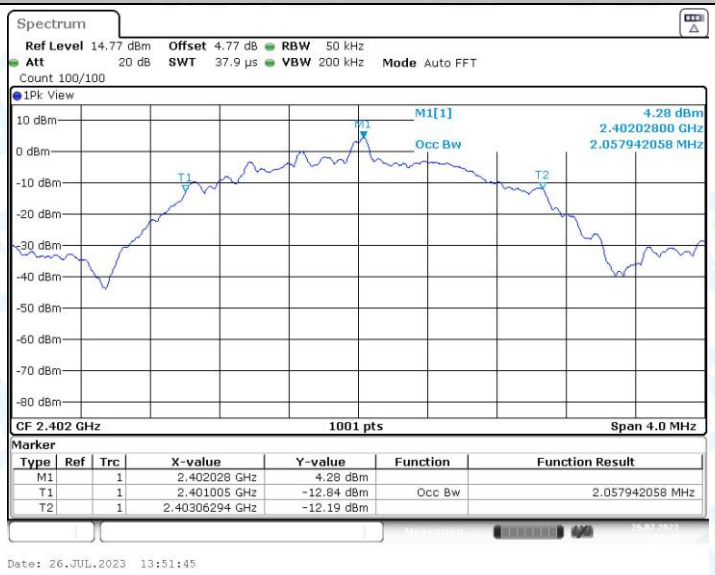
BLE_1M_Ant1_2440



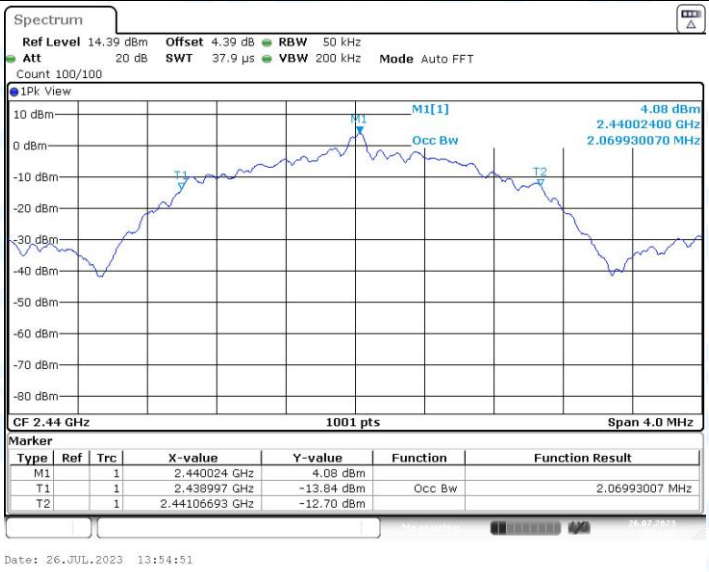
BLE_1M_Ant1_2480



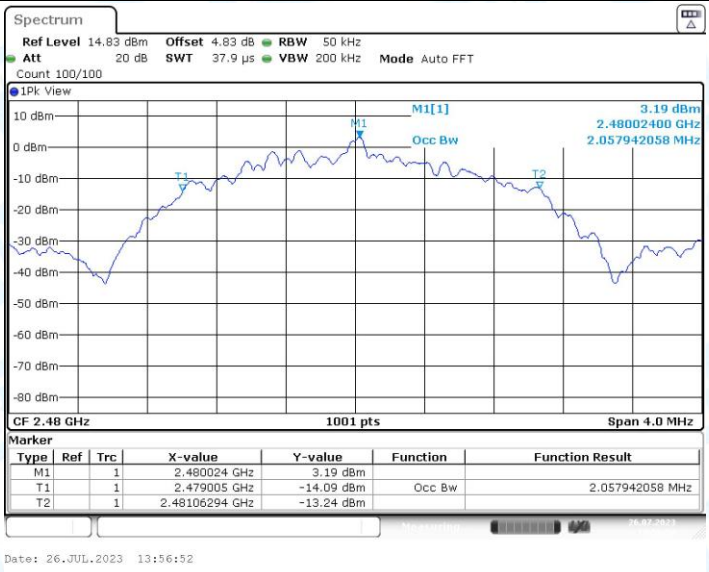
BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



BLE_2M_Ant1_2480



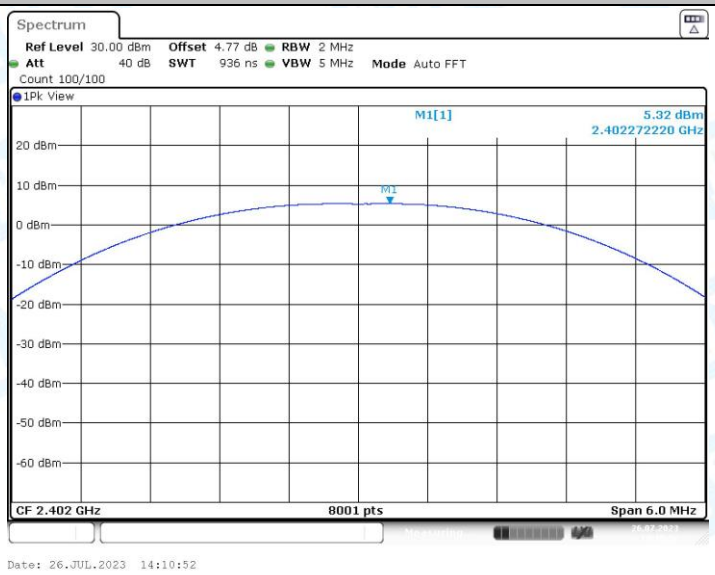
3. Maximum conducted output power

3.1.Test Result

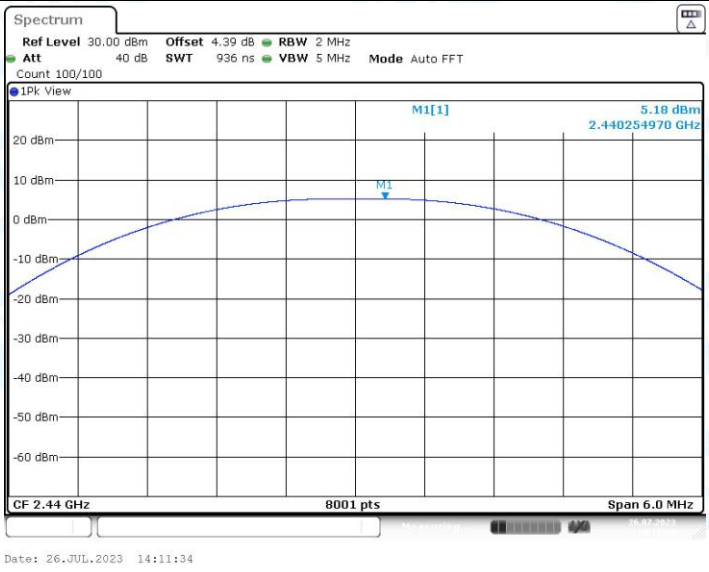
Test Mode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	5.32	≤30	PASS
		2440	5.18	≤30	PASS
		2480	4.32	≤30	PASS
BLE_2M	Ant1	2402	5.36	≤30	PASS
		2440	5.17	≤30	PASS
		2480	4.34	≤30	PASS

3.2.Test Graphs

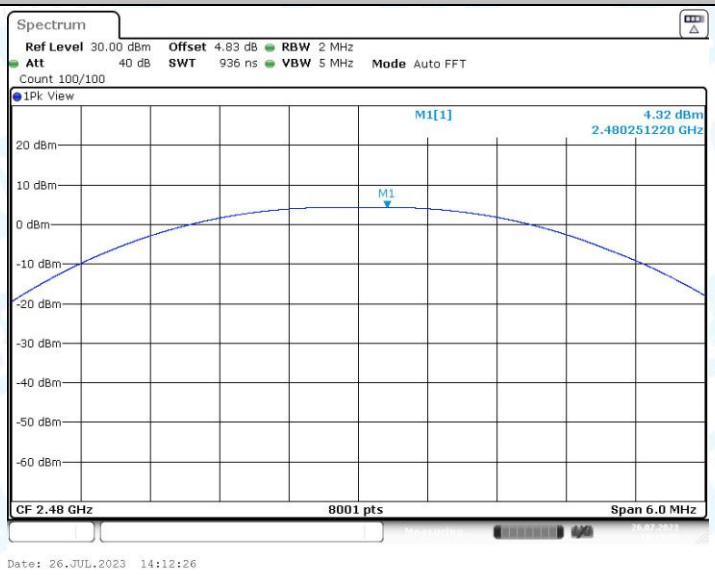
BLE_1M_Ant1_2402



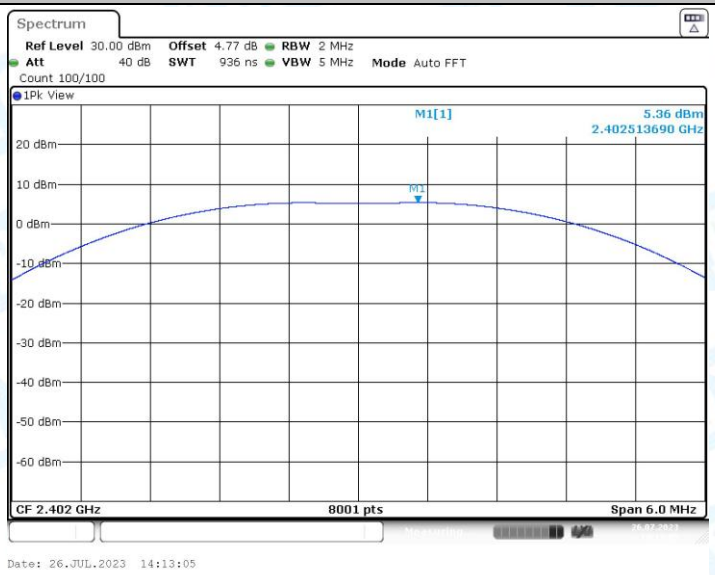
BLE_1M_Ant1_2440



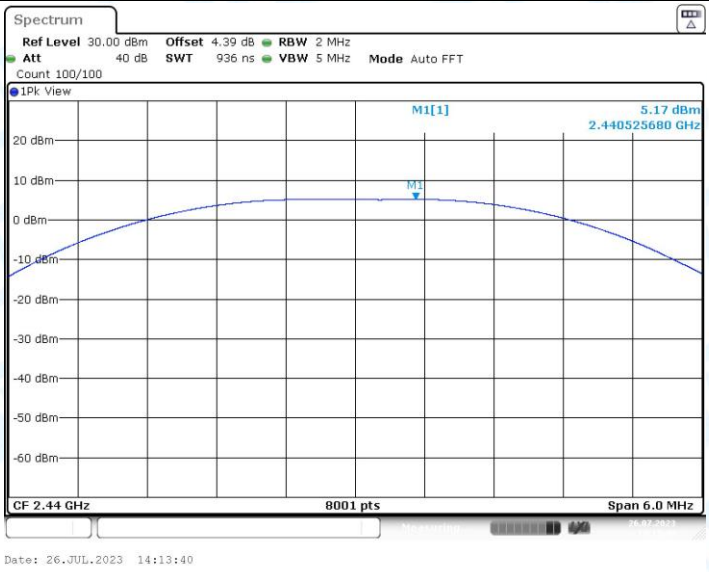
BLE_1M_Ant1_2480



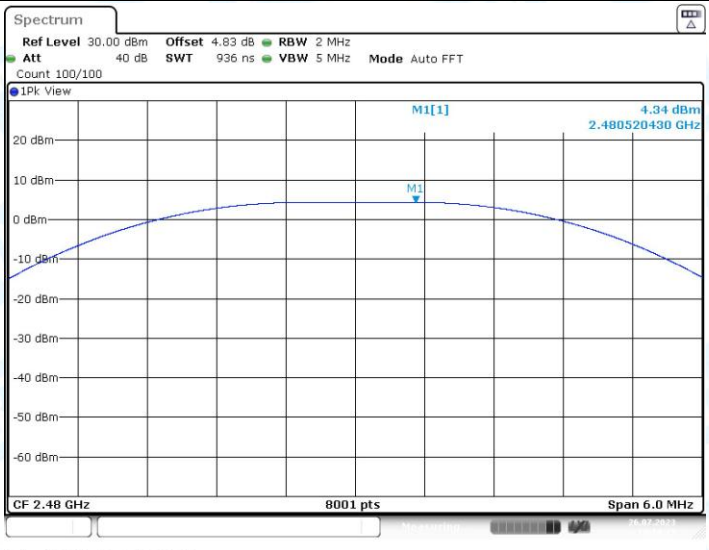
BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



BLE_2M_Ant1_2480



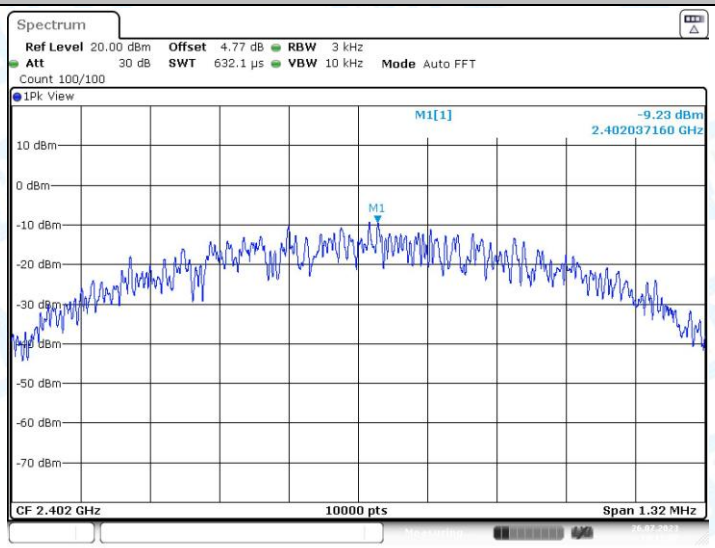
4. Maximum power spectral density

4.1.Test Result

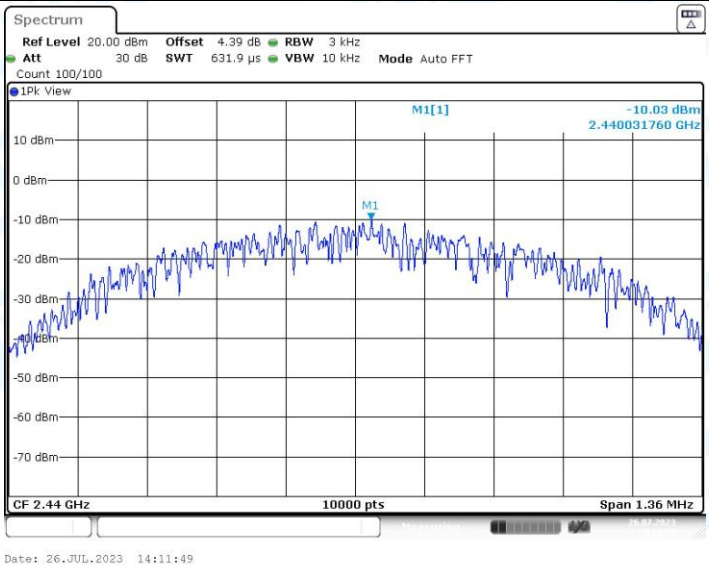
Test Mode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-9.23	≤8.00	PASS
		2440	-10.03	≤8.00	PASS
		2480	-10.78	≤8.00	PASS
BLE_2M	Ant1	2402	-12.13	≤8.00	PASS
		2440	-13.14	≤8.00	PASS
		2480	-12.91	≤8.00	PASS

4.2.Test Graphs

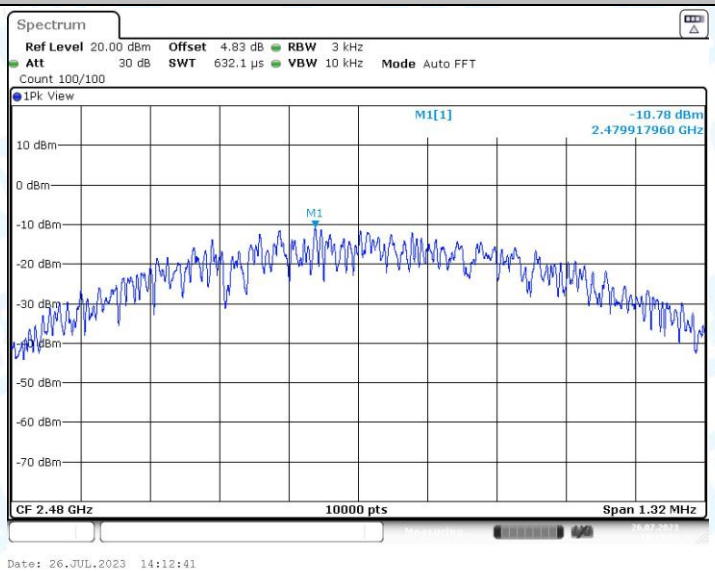
BLE_1M_Ant1_2402



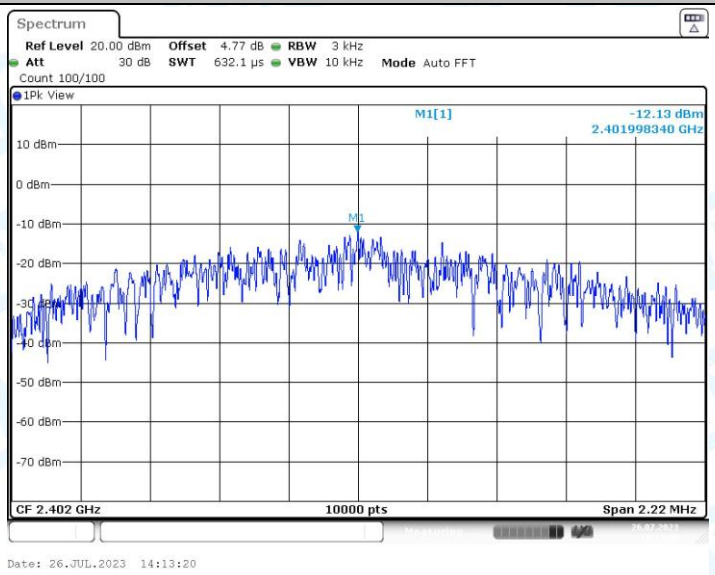
BLE_1M_Ant1_2440



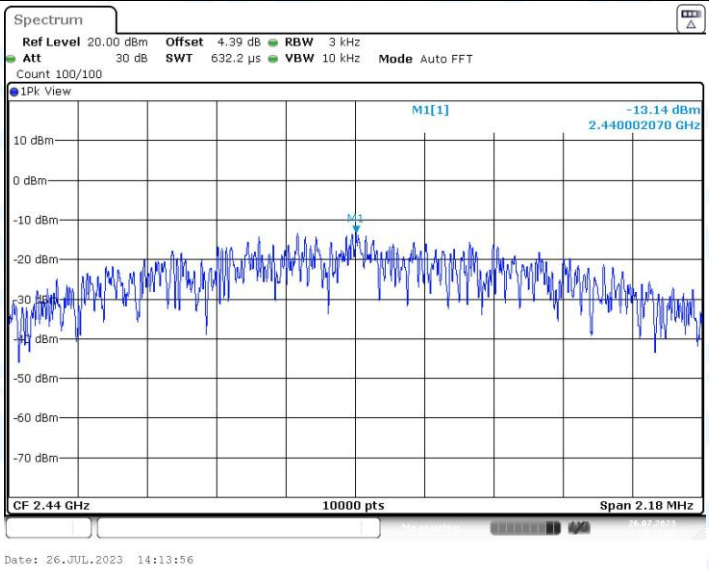
BLE_1M_Ant1_2480



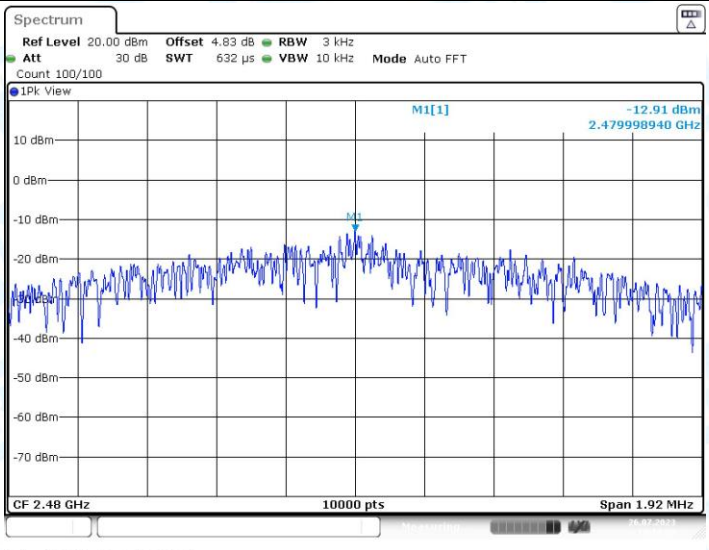
BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



BLE_2M_Ant1_2480



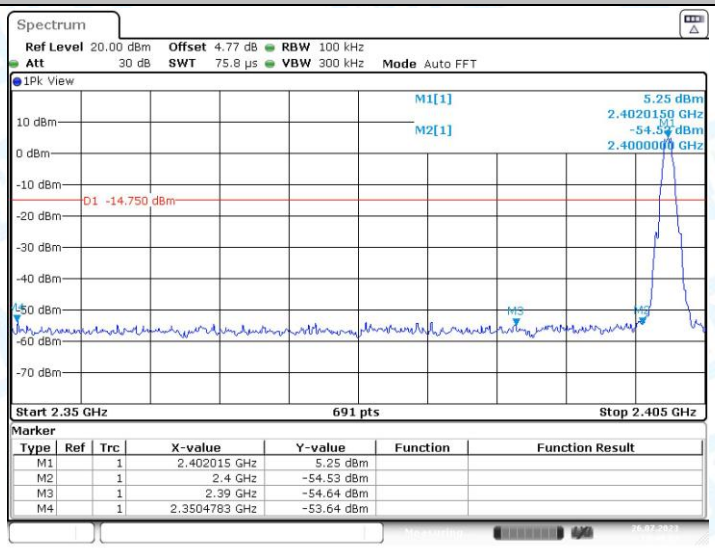
5. Band edge measurements

5.1.Test Result

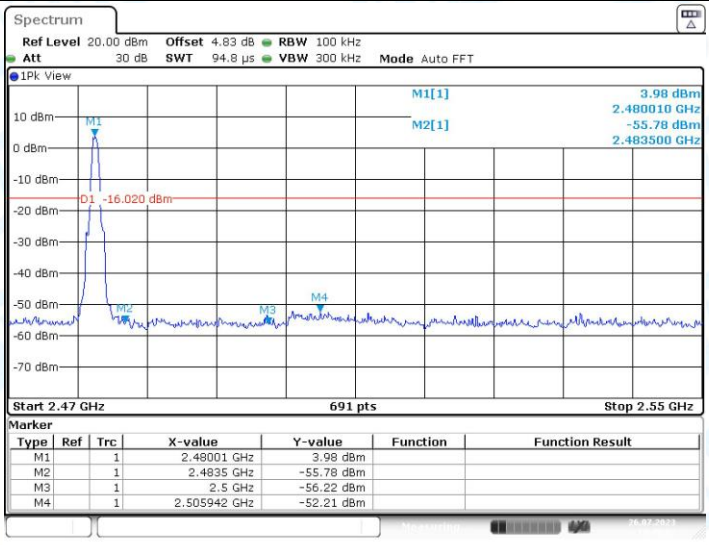
Test Mode	Antenna	ChName	Channel	Ref.Level[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	5.25	-53.64	≤-14.75	PASS
		High	2480	3.98	-52.21	≤-16.02	PASS
BLE_2M	Ant1	Low	2402	5.26	-27.22	≤-14.74	PASS
		High	2480	4.03	-51.52	≤-15.97	PASS

5.2.Test Graphs

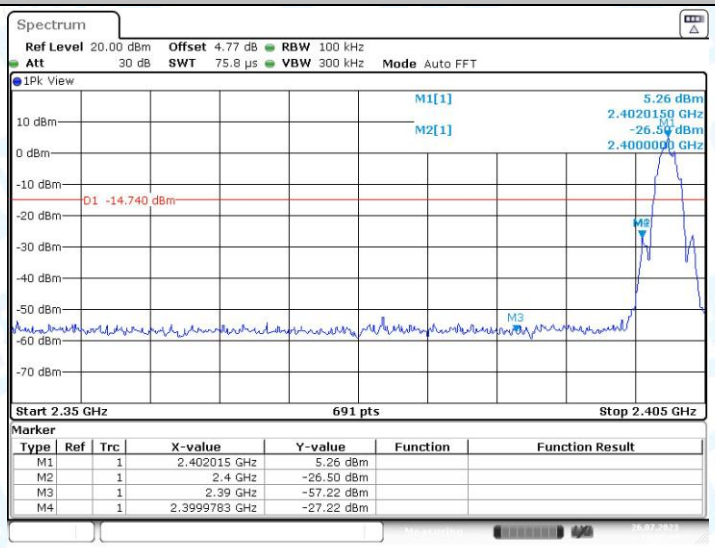
BLE_1M_Ant1_Low_2402



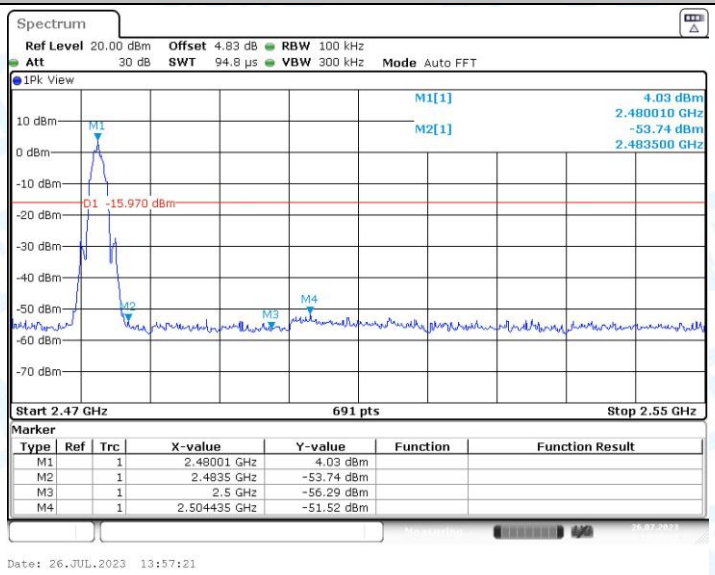
BLE_1M_Ant1_High_2480



BLE_2M_Ant1_Low_2402



BLE_2M_Ant1_High_2480



6. Conducted Spurious Emission

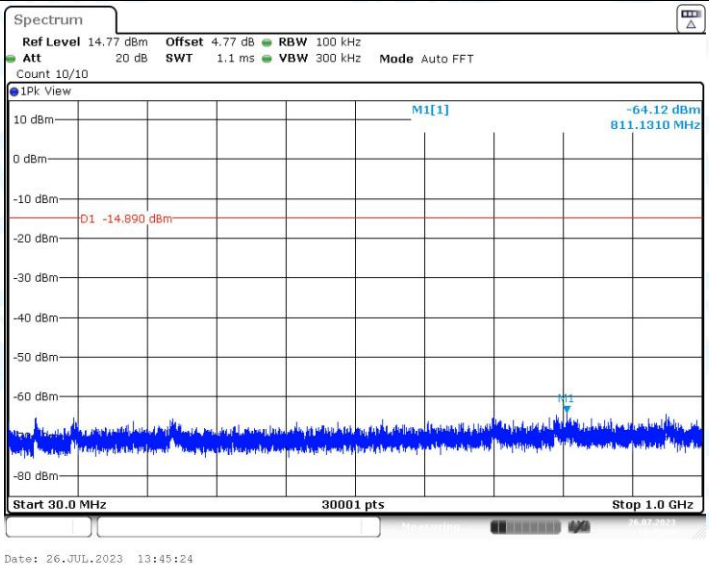
6.1.Test Result

Test Mode	Antenna	Channel	Freq. Range [MHz]	Ref. Level [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	5.11	5.11	---	PASS
			30~1000	5.11	-64.12	≤-14.89	PASS
			1000~26500	5.11	-42.87	≤-14.89	PASS
		2440	Reference	4.85	4.85	---	PASS
			30~1000	4.85	-64.79	≤-15.15	PASS
			1000~26500	4.85	-42.51	≤-15.15	PASS
		2480	Reference	3.91	3.91	---	PASS
			30~1000	3.91	-63.69	≤-16.09	PASS
			1000~26500	3.91	-42.34	≤-16.09	PASS
BLE_2M	Ant1	2402	Reference	5.16	5.16	---	PASS
			30~1000	5.16	-64.1	≤-14.84	PASS
			1000~26500	5.16	-42.97	≤-14.84	PASS
		2440	Reference	4.89	4.89	---	PASS
			30~1000	4.89	-63.63	≤-15.11	PASS
			1000~26500	4.89	-42.88	≤-15.11	PASS
		2480	Reference	3.95	3.95	---	PASS
			30~1000	3.95	-63.11	≤-16.05	PASS
			1000~26500	3.95	-43.01	≤-16.05	PASS

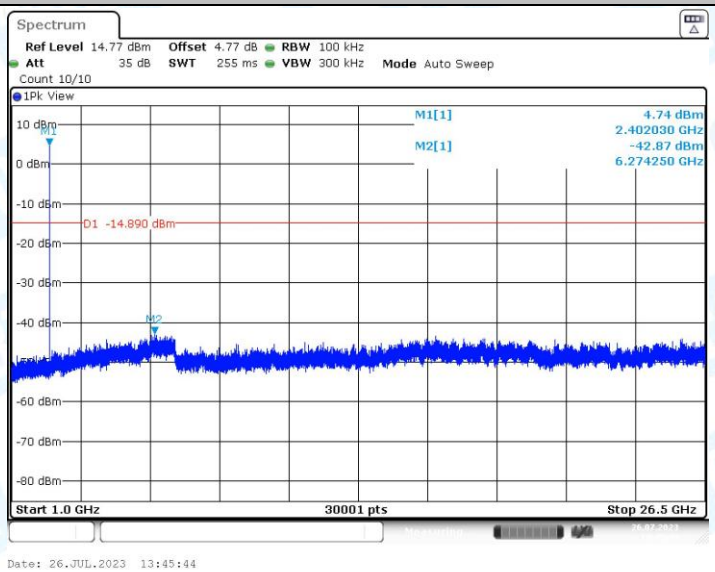
6.2.Test Graphs

BLE_1M_Ant1_2402_0~Reference

BLE_1M_Ant1_2402_30~1000

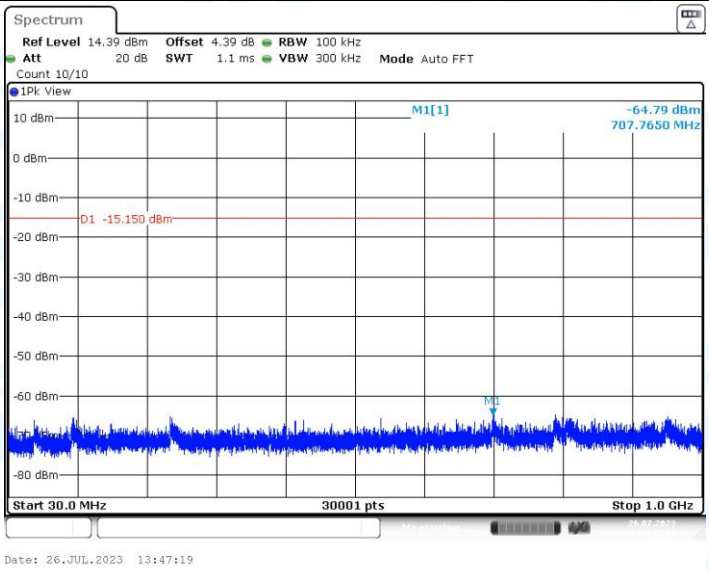


BLE_1M_Ant1_2402_1000~26500

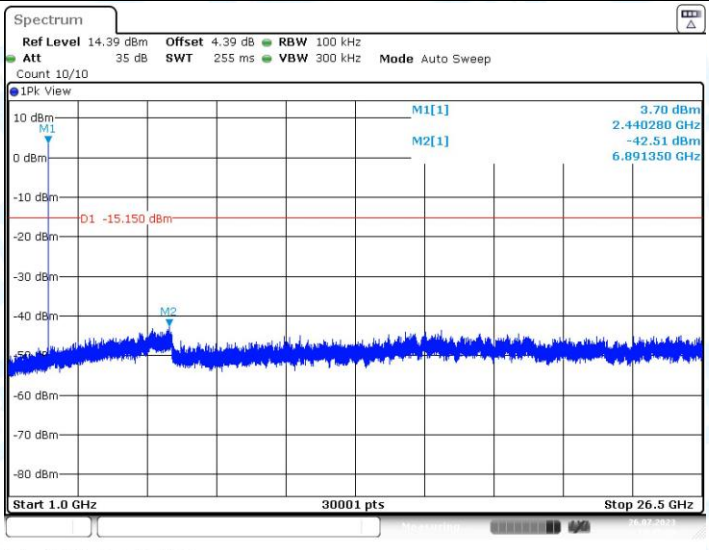


BLE_1M_Ant1_2440_0~Reference

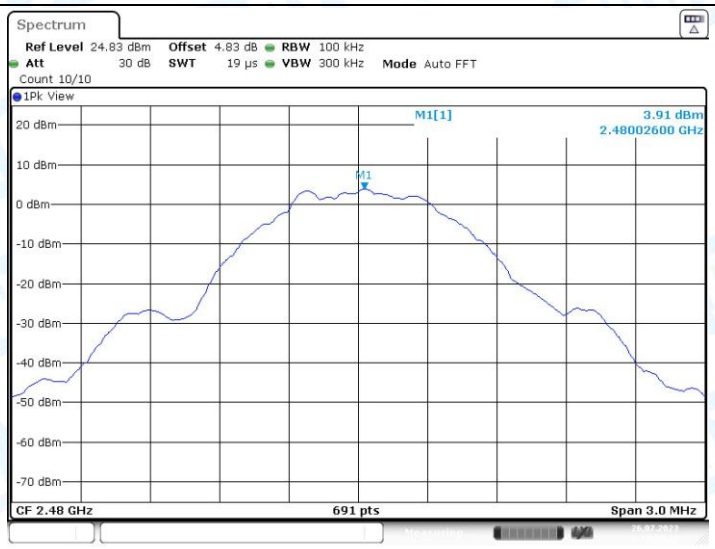
BLE_1M_Ant1_2440_30~1000



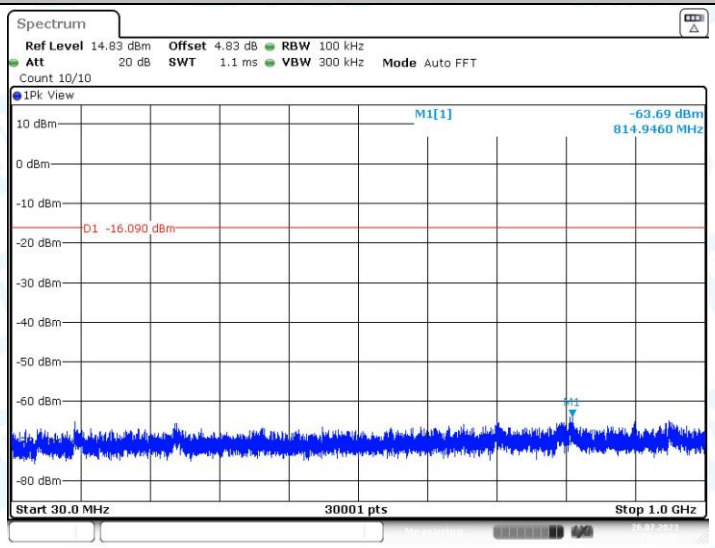
BLE_1M_Ant1_2440_1000~26500



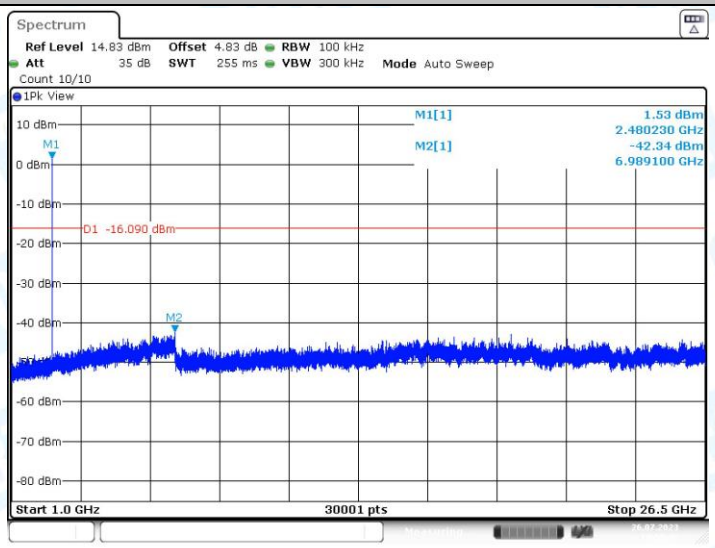
BLE_1M_Ant1_2480_0~Reference



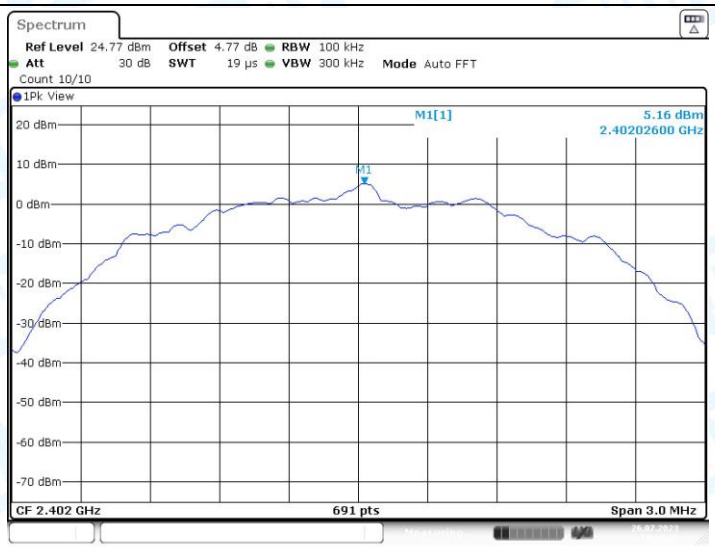
BLE_1M_Ant1_2480_30~1000



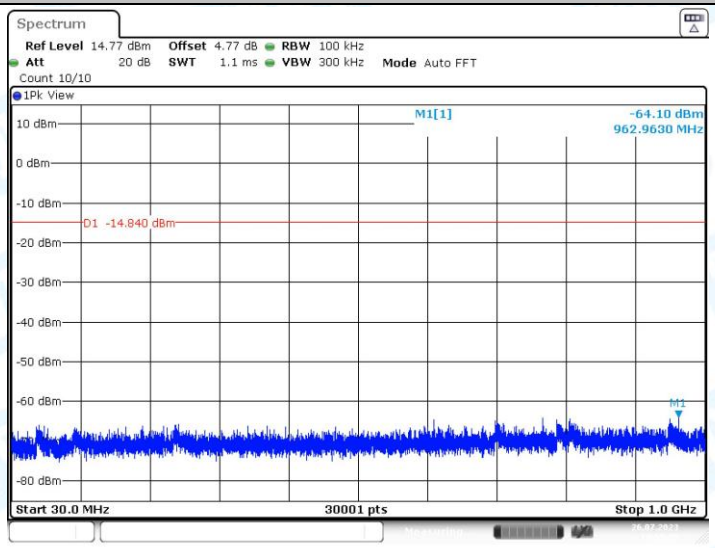
BLE_1M_Ant1_2480_1000~26500



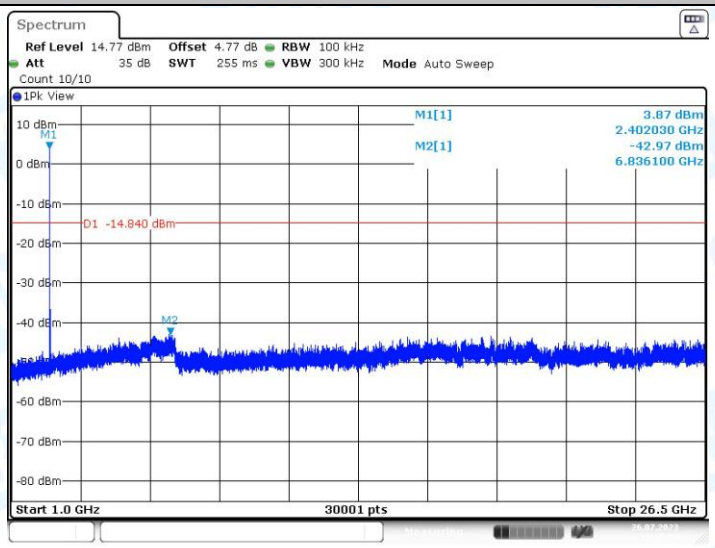
BLE_2M_Ant1_2402_0~Reference



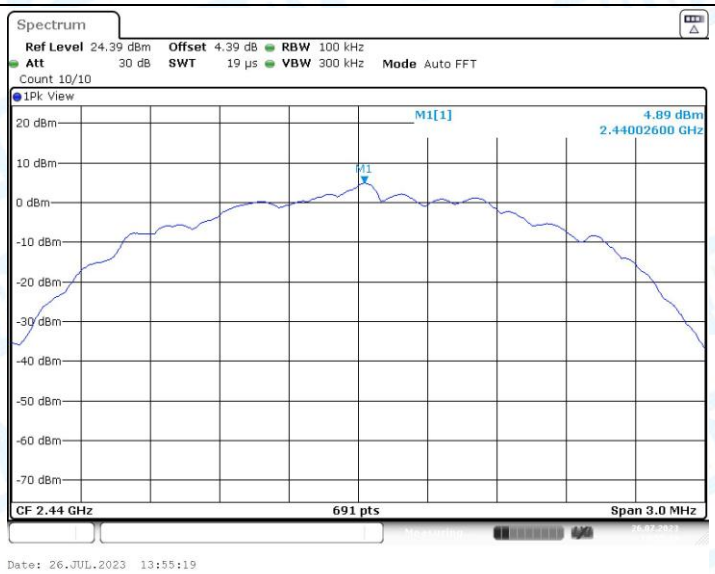
BLE_2M_Ant1_2402_30~1000



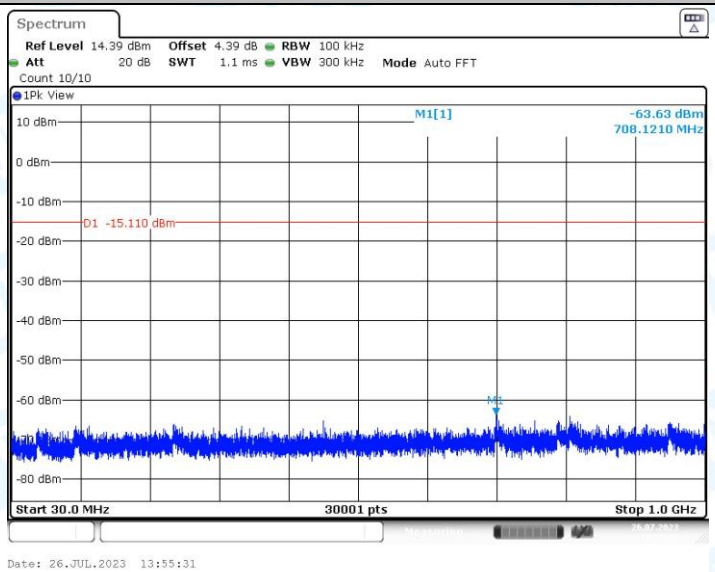
BLE_2M_Ant1_2402_1000~26500



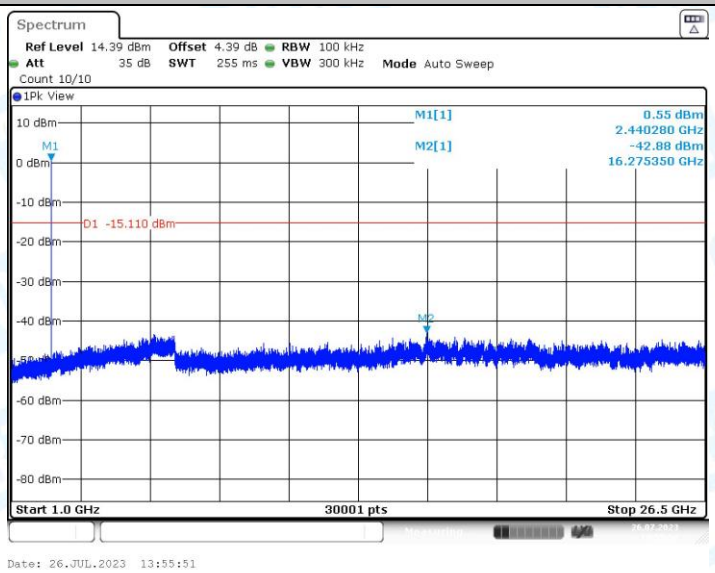
BLE_2M_Ant1_2440_0~Reference



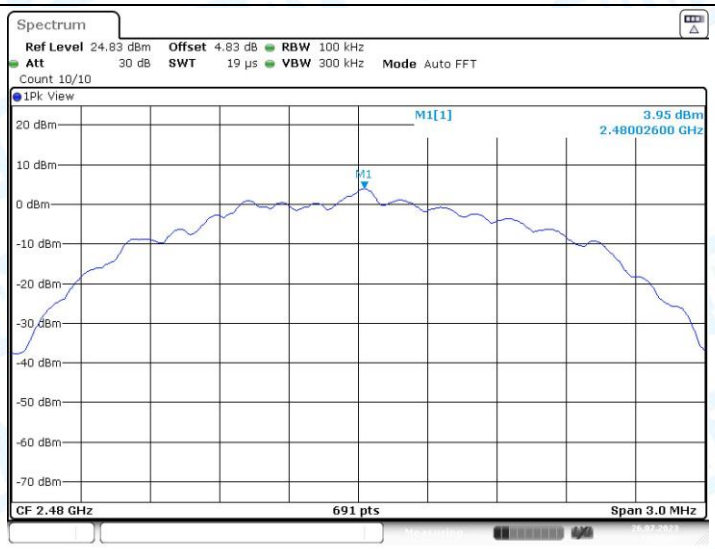
BLE_2M_Ant1_2440_30~1000



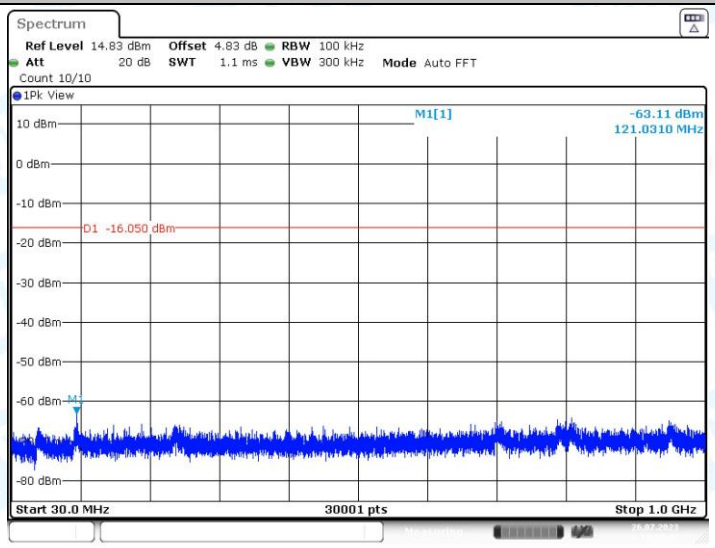
BLE_2M_Ant1_2440_1000~26500



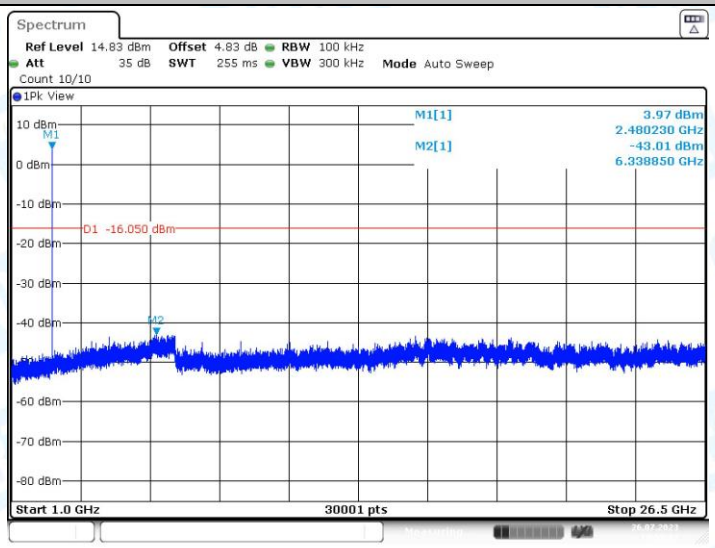
BLE_2M_Ant1_2480_0~Reference



BLE_2M_Ant1_2480_30~1000



BLE_2M_Ant1_2480_1000~26500



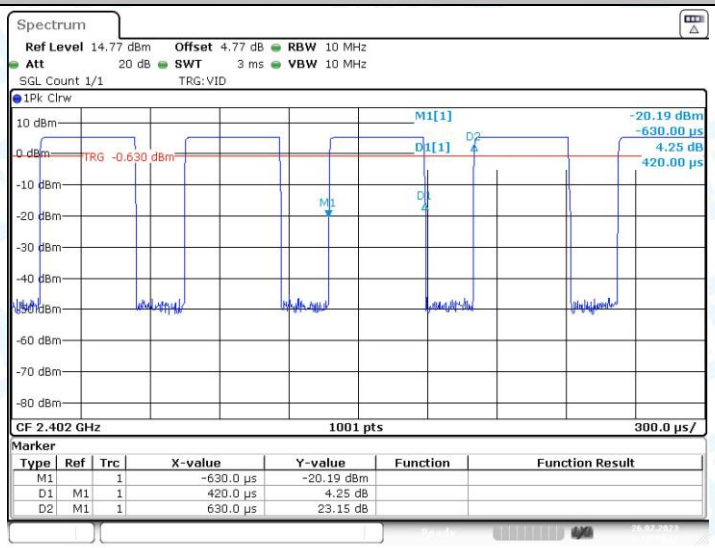
7. Duty Cycle

7.1.Test Result

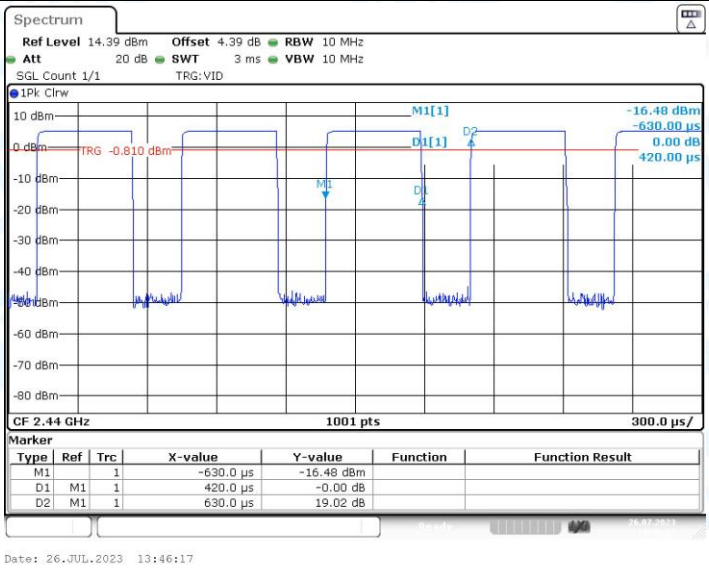
Test Mode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	1/T [KHz]	Limit	Verdict
BLE_1M	Ant1	2402	0.42	0.63	66.67	2.38	---	---
		2440	0.42	0.63	66.67	2.38	---	---
		2480	0.42	0.63	66.67	2.38	---	---
BLE_2M	Ant1	2402	0.23	0.62	37.10	4.35	---	---
		2440	0.23	0.62	37.10	4.35	---	---
		2480	0.23	0.63	36.51	4.35	---	---
Note:1/T=1/ Transmission Duration								

7.2.Test Graphs

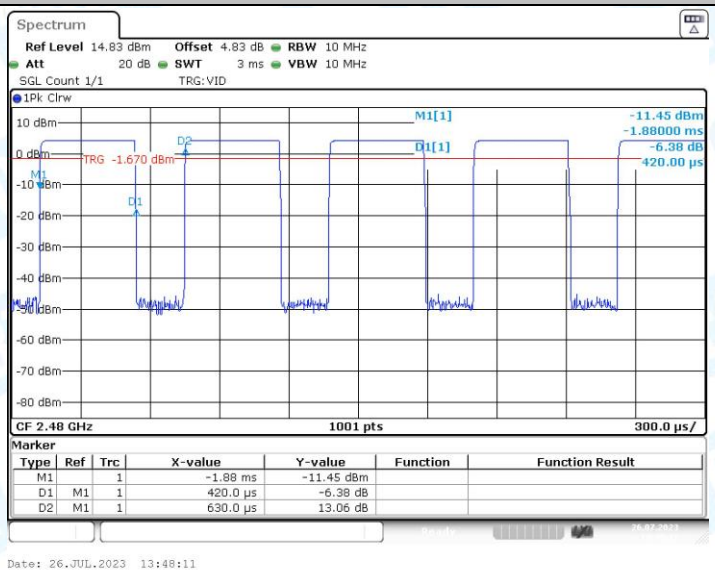
BLE_1M_Ant1_2402



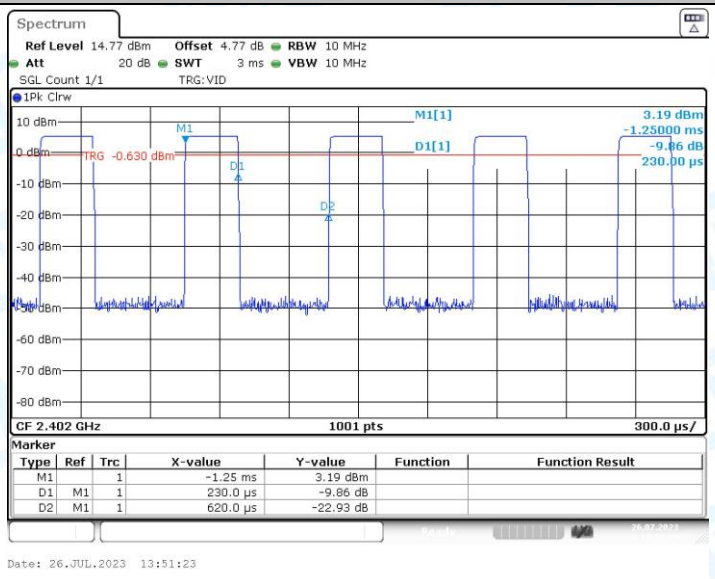
BLE_1M_Ant1_2440



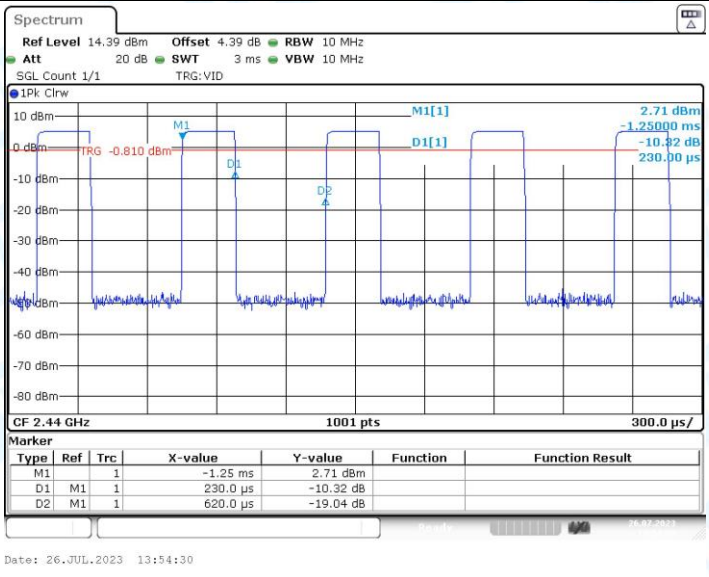
BLE_1M_Ant1_2480



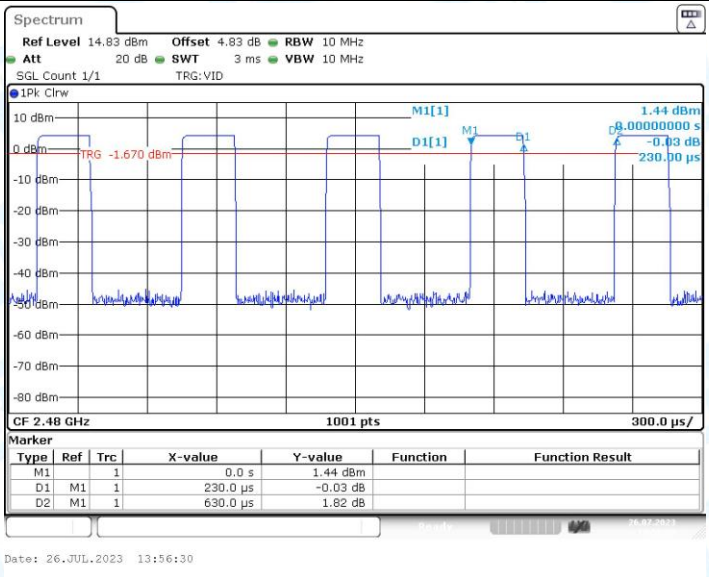
BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



BLE_2M_Ant1_2480



8. Emissions in Restricted Bands

8.1.Test Result

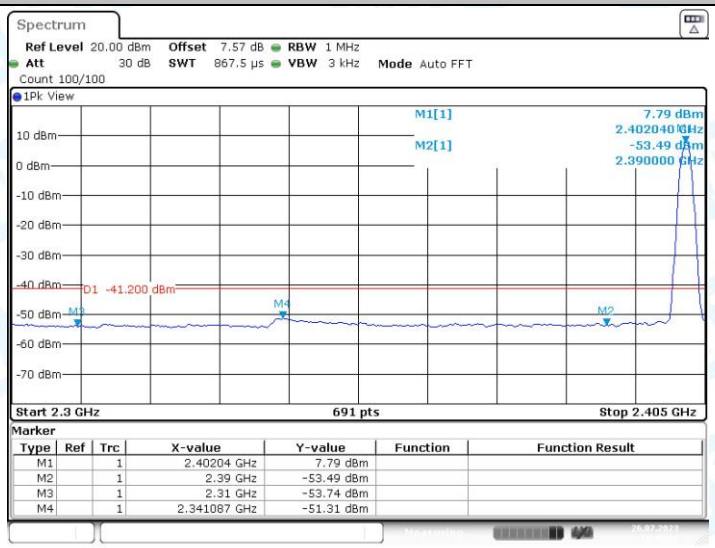
Test Mode	Antenna	ChName	Channel	Detector	Freq. [MHz]	Result [dBm]	Limit [dBm]	Verdict
BLE_1M	Ant1	Low	2402	AV	2310.000	-53.74	≤-41.20	PASS
				AV	2341.087	-51.31	≤-41.20	PASS
				AV	2390.000	-53.49	≤-41.20	PASS
				Peak	2310.000	-45.17	≤-21.20	PASS
				Peak	2359.804	-40.85	≤-21.20	PASS
				Peak	2390.000	-44.62	≤-21.20	PASS
		High	2480	AV	2483.500	-52.52	≤-41.20	PASS
				AV	2486.696	-52.02	≤-41.20	PASS
				AV	2500.000	-52.69	≤-41.20	PASS
				Peak	2483.500	-42.51	≤-21.20	PASS
				Peak	2484.609	-39.19	≤-21.20	PASS
				Peak	2500.000	-43.05	≤-21.20	PASS
BLE_2M	Ant1	Low	2402	AV	2310.000	-53.27	≤-41.20	PASS
				AV	2342.000	-51.06	≤-41.20	PASS
				AV	2390.000	-53.34	≤-41.20	PASS
				Peak	2310.000	-43.83	≤-21.20	PASS
				Peak	2380.348	-40.35	≤-21.20	PASS
				Peak	2390.000	-43.47	≤-21.20	PASS
		High	2480	AV	2483.500	-49.39	≤-41.20	PASS
				AV	2483.565	-50.53	≤-41.20	PASS
				AV	2500.000	-52.46	≤-41.20	PASS
				Peak	2483.500	-41.81	≤-21.20	PASS
				Peak	2484.145	-40.1	≤-21.20	PASS
				Peak	2500.000	-41.81	≤-21.20	PASS

Note：

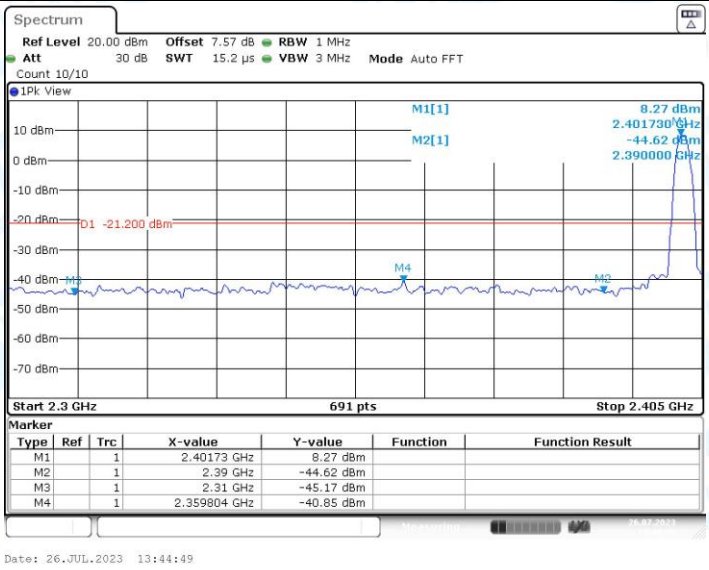
1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

8.2.Test Graphs

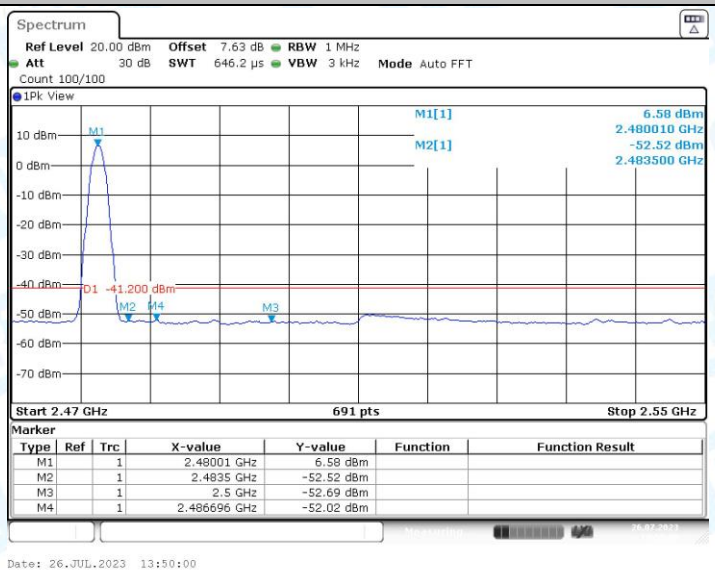
BLE_1M_Ant1_Low_2402_AV



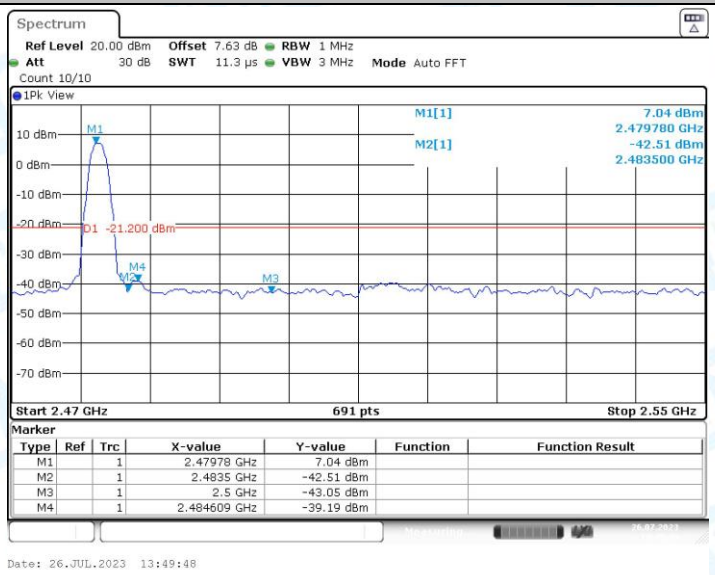
BLE_1M_Ant1_Low_2402_Peak



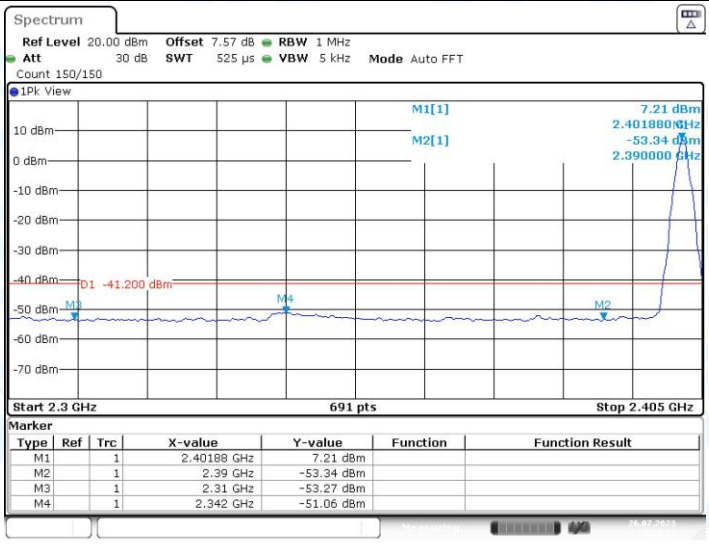
BLE_1M_Ant1_High_2480_AV



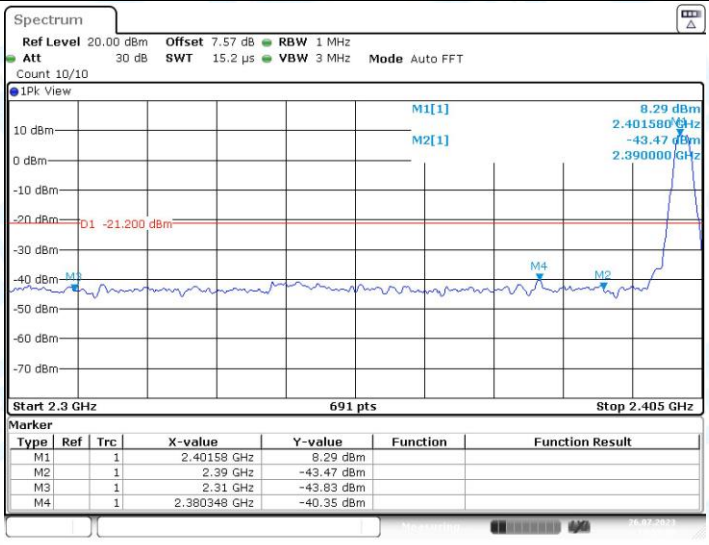
BLE_1M_Ant1_High_2480_Peak



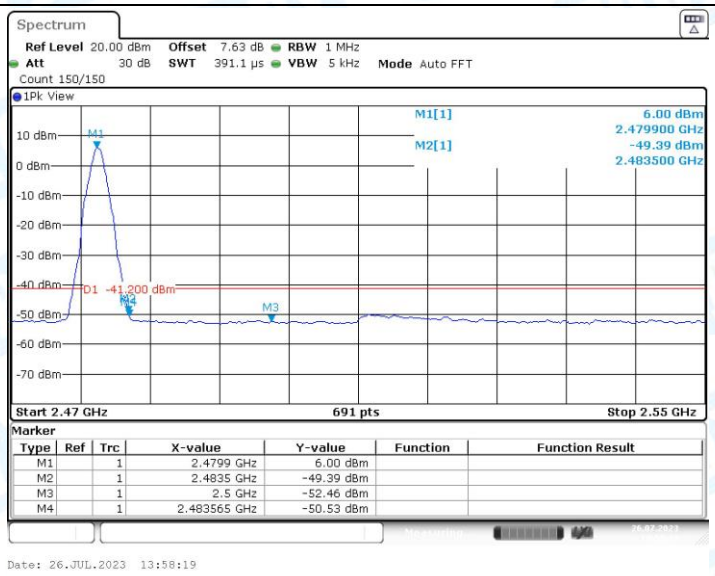
BLE_2M_Ant1_Low_2402_AV



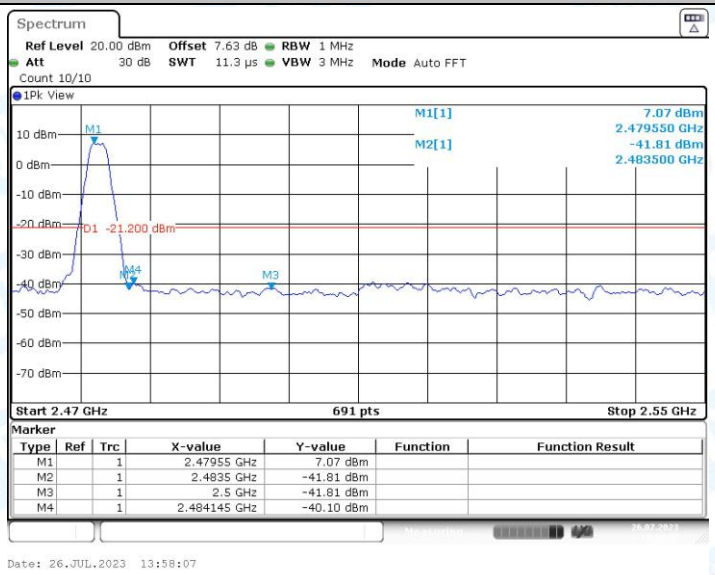
BLE_2M_Ant1_Low_2402_Peak



BLE_2M_Ant1_High_2480_AV



BLE_2M_Ant1_High_2480_Peak



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