

RF Test Data for BLE (Conducted Measurements)

General Description of EUT	
EUT Name:	Smart earphone
Model:	DK56-TWS
Sample ID:	HC-C-202502-0078-02-02-2#
Test Standard:	FCC Part 15.247
Environmental Conditions	
Ambient Temperature:	24.1℃
Ambient Humidity:	43%RH
Test Power Supply:	DC 3.7V
Test Engineer:	ZKN ZHOU
Note: For a more detailed features description, please refer to the report TBR-C-202502-0078-44	

Contents

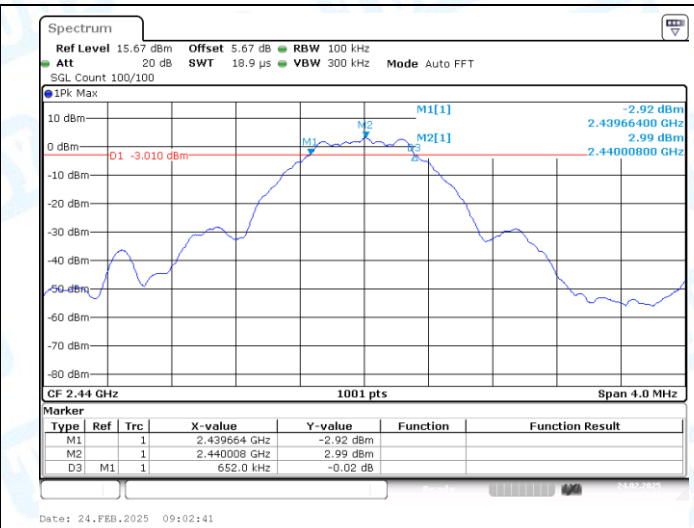
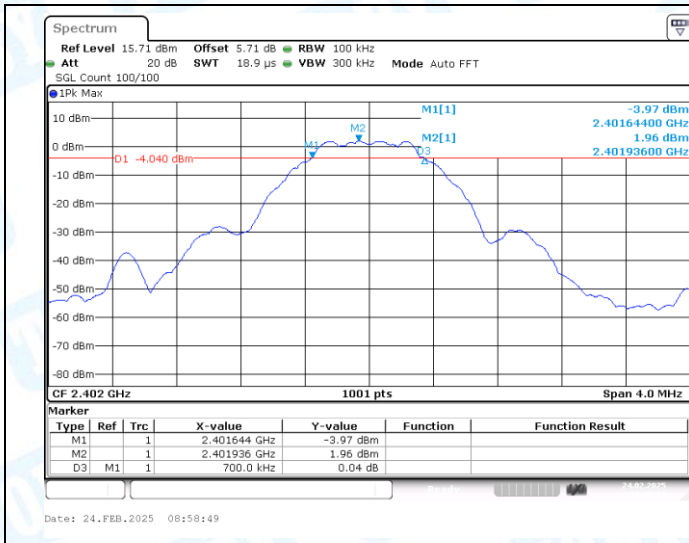
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1: DTS Bandwidth

1.1 Test Result

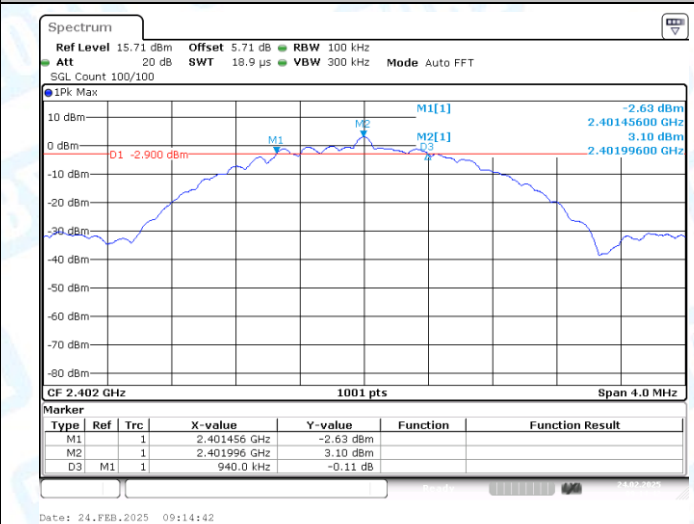
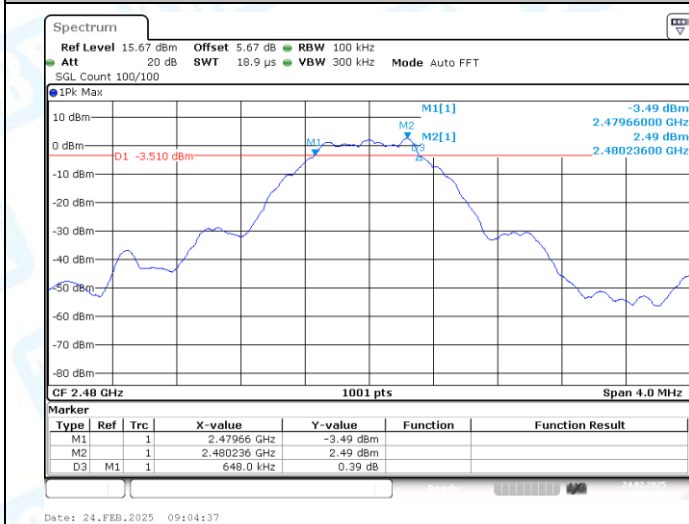
Test Mode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.70	2401.64	2402.34	0.5	PASS
BLE_1M	Ant1	2440	0.65	2439.66	2440.32	0.5	PASS
BLE_1M	Ant1	2480	0.65	2479.66	2480.31	0.5	PASS
BLE_2M	Ant1	2402	0.94	2401.46	2402.40	0.5	PASS
BLE_2M	Ant1	2440	1.23	2439.33	2440.56	0.5	PASS
BLE_2M	Ant1	2480	1.16	2479.41	2480.57	0.5	PASS

1.2 Test Graphs



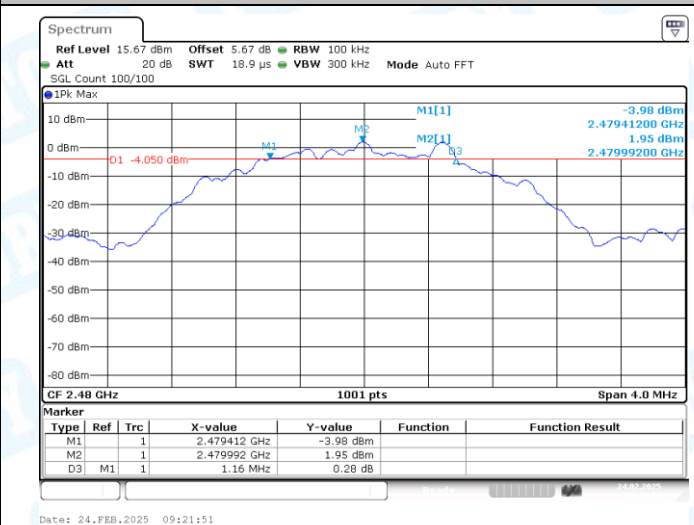
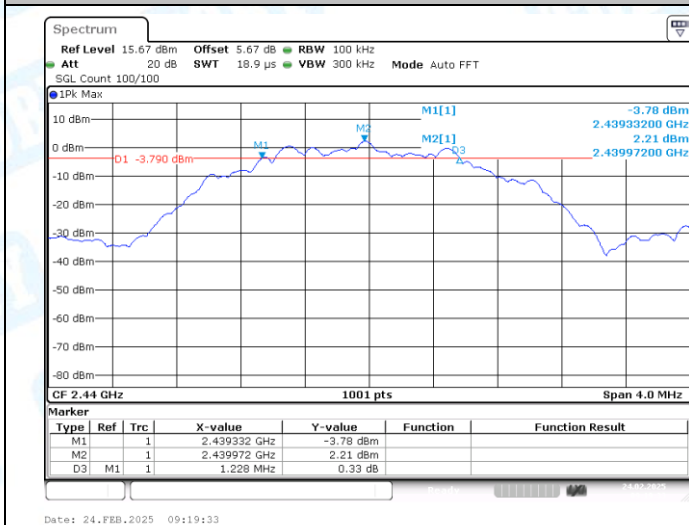
BLE_1M-Ant1-2402-PASS

BLE_1M-Ant1-2440-PASS



BLE_1M-Ant1-2480-PASS

BLE_2M-Ant1-2402-PASS



BLE_2M-Ant1-2440-PASS

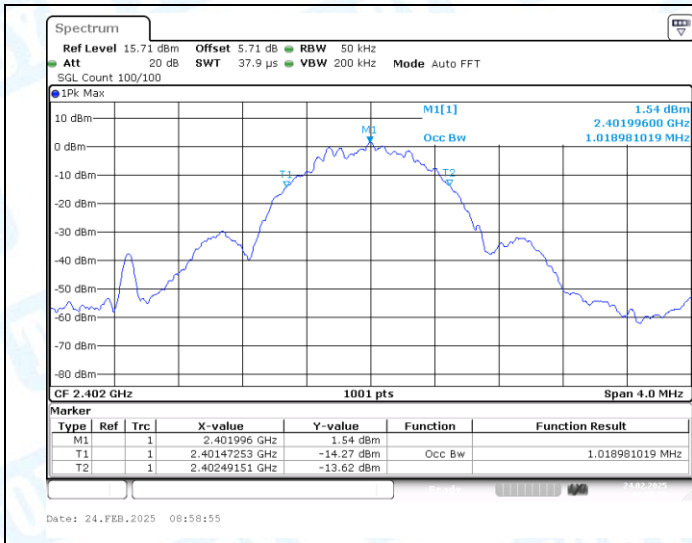
BLE_2M-Ant1-2480-PASS

2: Occupied Channel Bandwidth

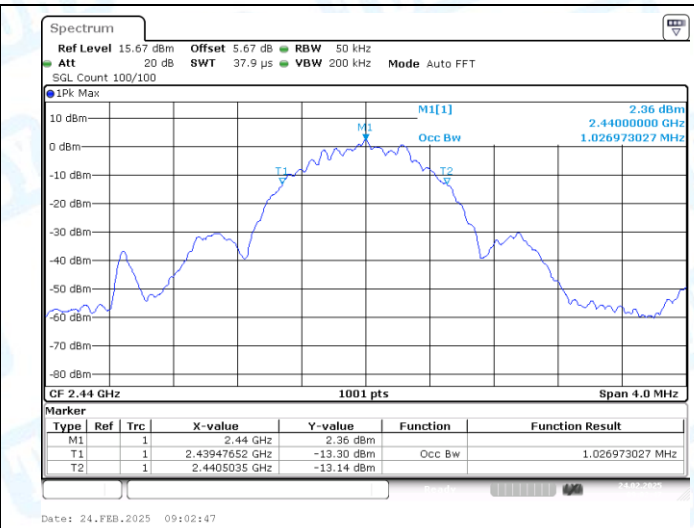
2.1 Test Result

Test Mode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	1.019	2401.4725	2402.4915	---	---
BLE_1M	Ant1	2440	1.027	2439.4765	2440.5035	---	---
BLE_1M	Ant1	2480	1.007	2479.4845	2480.4915	---	---
BLE_2M	Ant1	2402	2.058	2400.9650	2403.0230	---	---
BLE_2M	Ant1	2440	2.034	2438.9810	2441.0150	---	---
BLE_2M	Ant1	2480	2.086	2478.9570	2481.0430	---	---

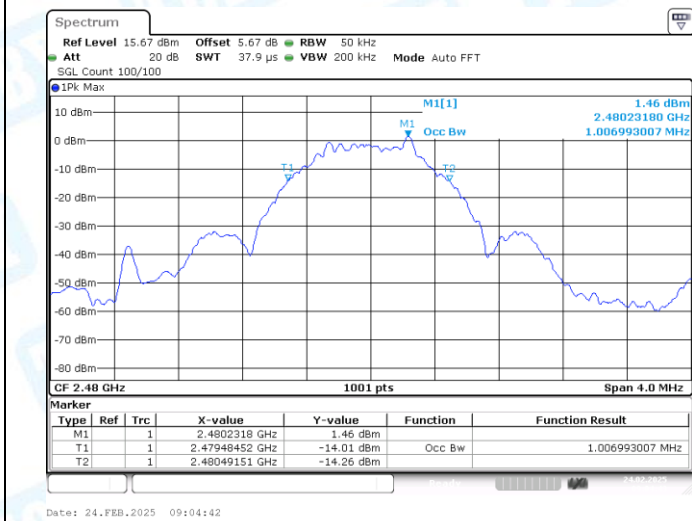
2.2 Test Graphs



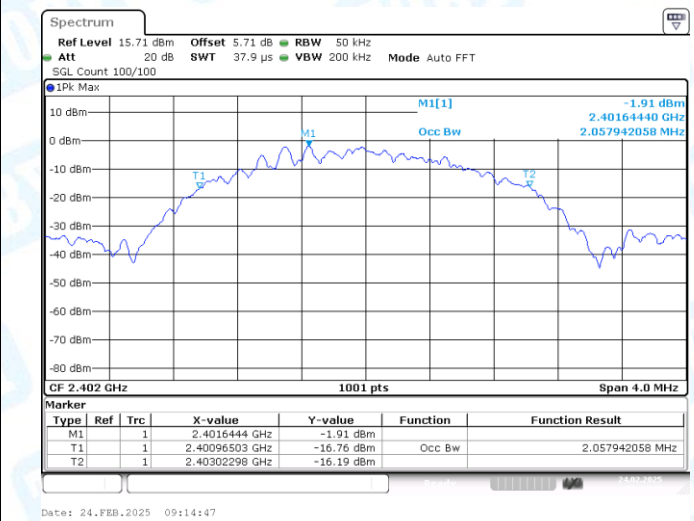
BLE_1M-Ant1-2402



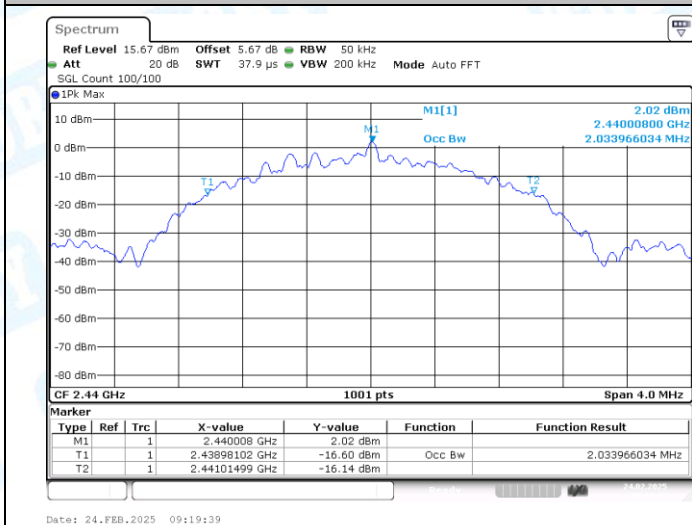
BLE_1M-Ant1-2440



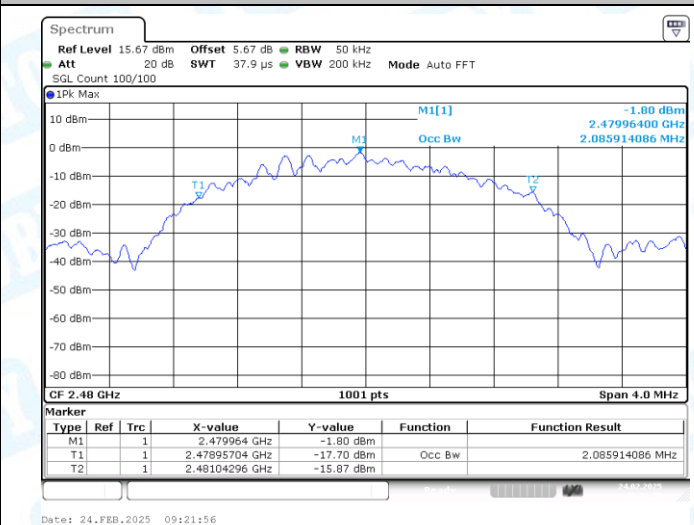
BLE_1M-Ant1-2480



BLE_2M-Ant1-2402



BLE_2M-Ant1-2440



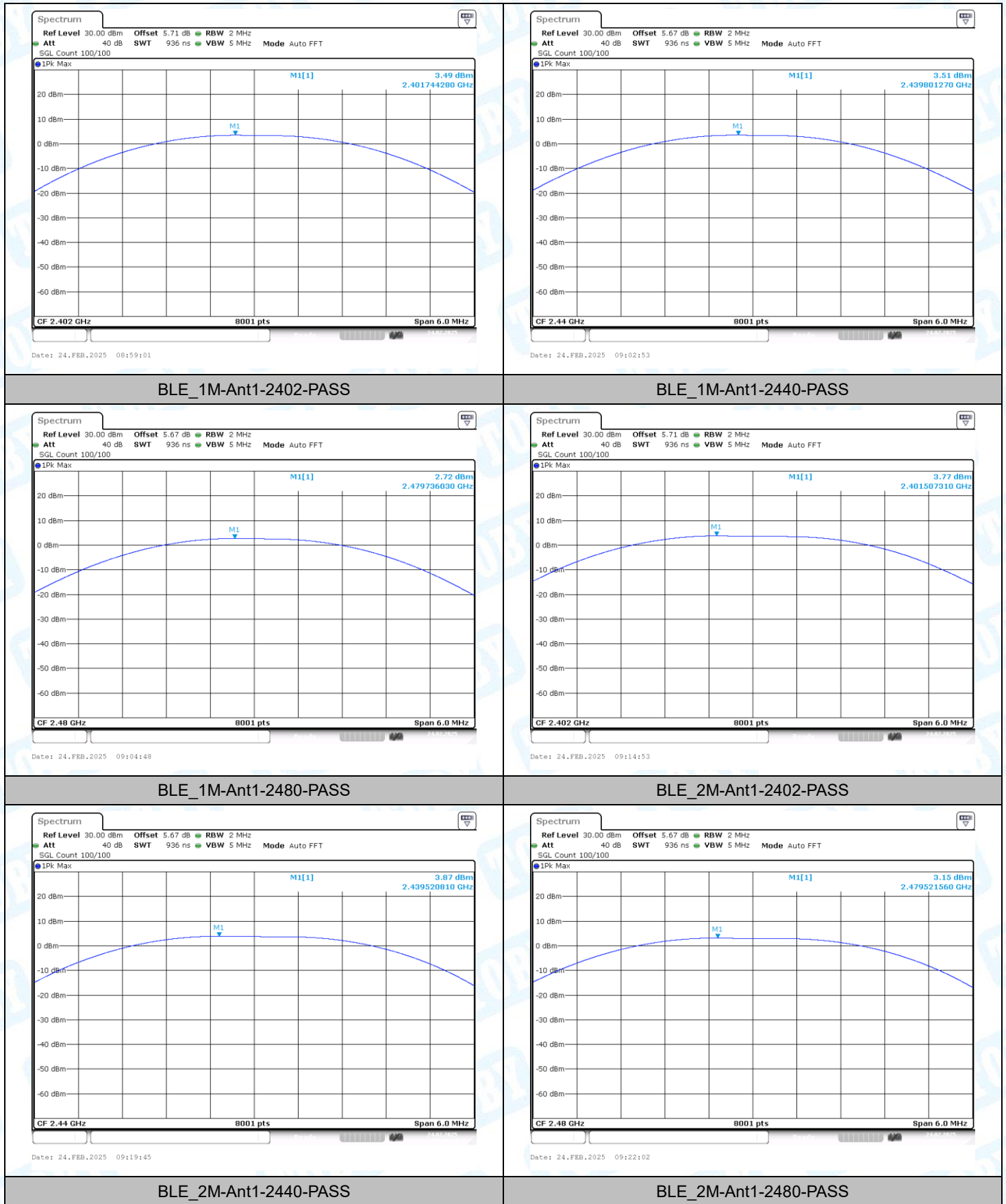
BLE_2M-Ant1-2480

3: Maximum conducted output power

3.1 Test Result Peak

Test Mode	Antenna	Frequency[MHz]	Conducted Peak Power[dBm]	Conducted Limit[dBm]	Verdict
BLE_1M	Ant1	2402	3.49	≤30	PASS
BLE_1M	Ant1	2440	3.51	≤30	PASS
BLE_1M	Ant1	2480	2.72	≤30	PASS
BLE_2M	Ant1	2402	3.77	≤30	PASS
BLE_2M	Ant1	2440	3.87	≤30	PASS
BLE_2M	Ant1	2480	3.15	≤30	PASS

3.2 Test Graphs Peak

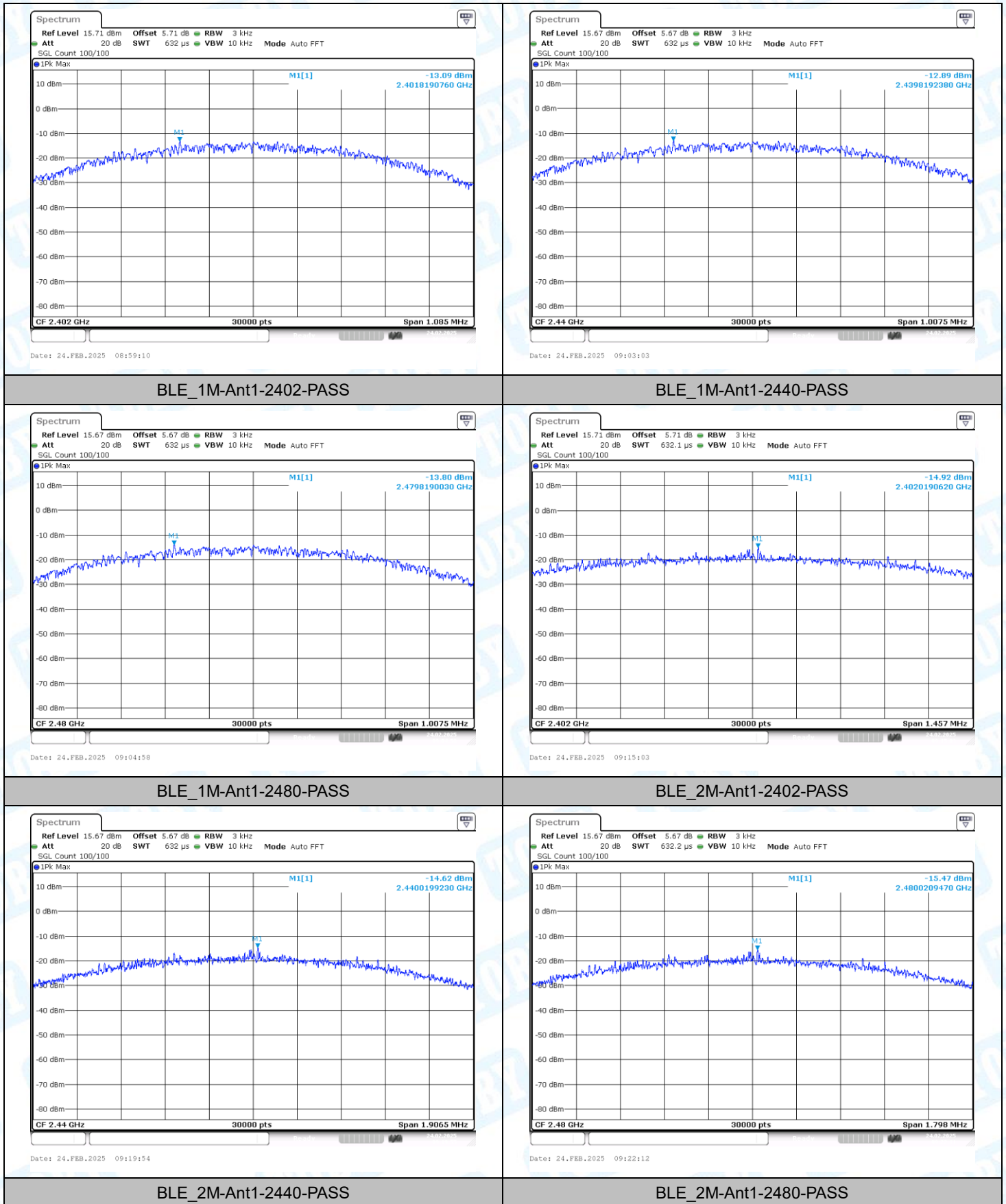


4: Maximum power spectral density

4.1 Test Result

Test Mode	Antenna	Frequency[MHz]	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-13.09	≤8.00	PASS
BLE_1M	Ant1	2440	-12.89	≤8.00	PASS
BLE_1M	Ant1	2480	-13.80	≤8.00	PASS
BLE_2M	Ant1	2402	-14.92	≤8.00	PASS
BLE_2M	Ant1	2440	-14.62	≤8.00	PASS
BLE_2M	Ant1	2480	-15.47	≤8.00	PASS

4.2 Test Graphs

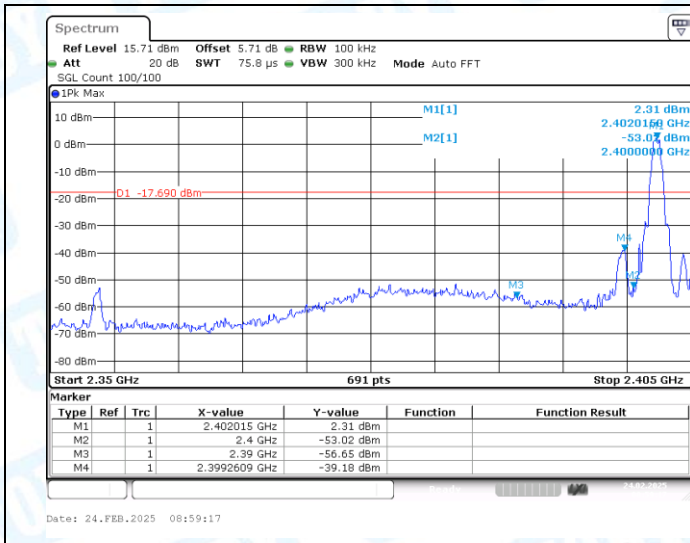


5: Band edge measurements

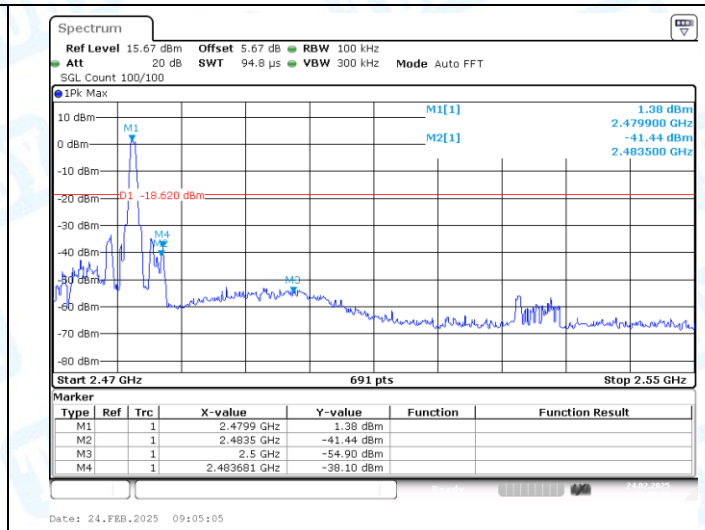
5.1 Test Result

Test Mode	Antenna	ChName	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	2.31	-39.18	≤-17.69	PASS
BLE_1M	Ant1	High	2480	1.38	-38.1	≤-18.62	PASS
BLE_2M	Ant1	Low	2402	2.51	-30.52	≤-17.49	PASS
BLE_2M	Ant1	High	2480	1.28	-41.41	≤-18.72	PASS

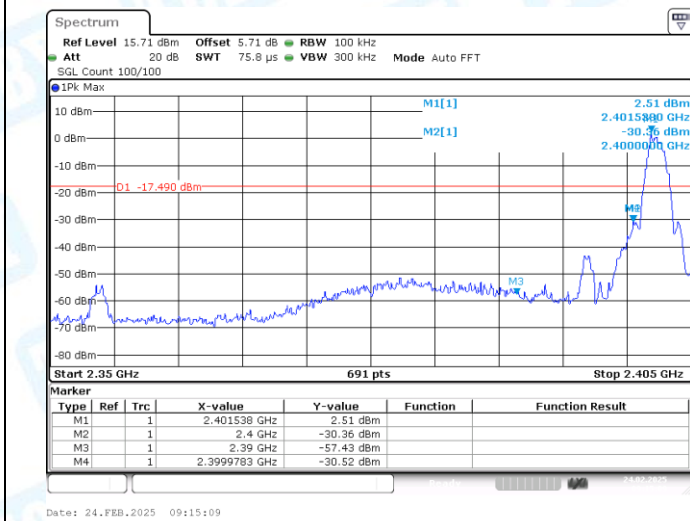
5.2 Test Graphs



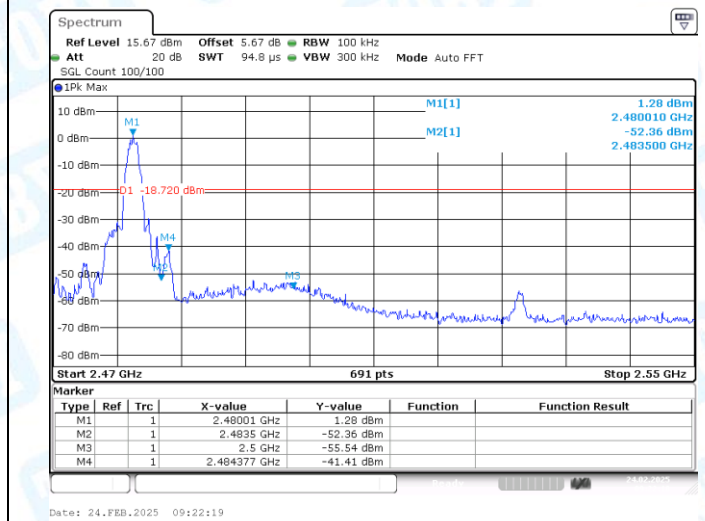
BLE_1M-Ant1-2402-PASS



BLE_1M-Ant1-2480-PASS



BLE_2M-Ant1-2402-PASS



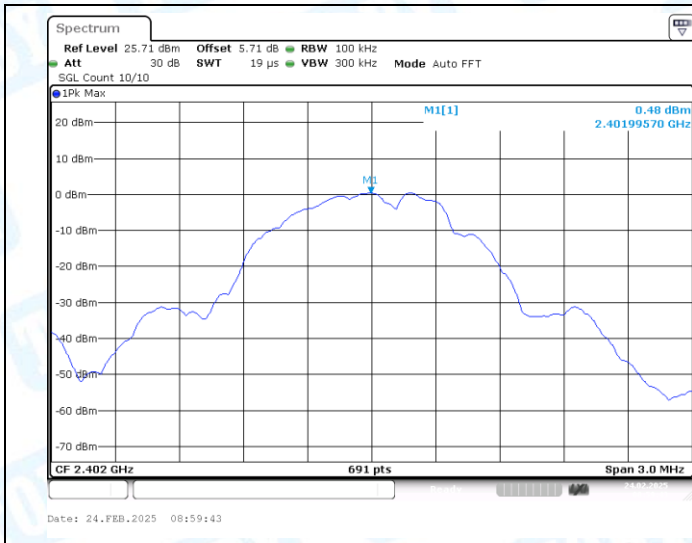
BLE_2M-Ant1-2480-PASS

6: Conducted Spurious Emission

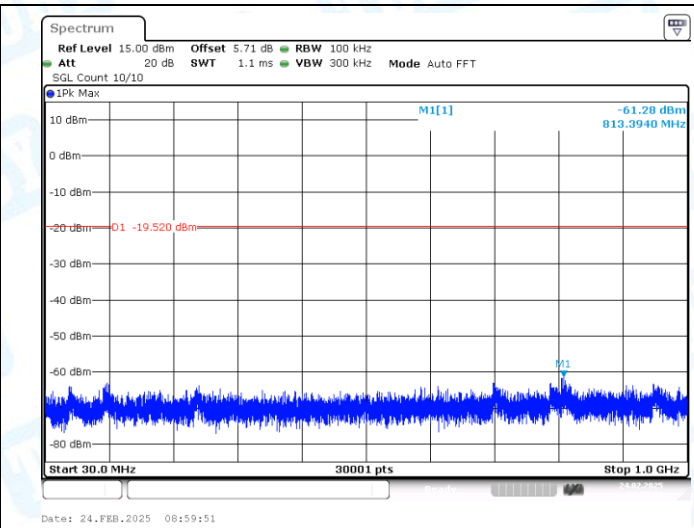
6.1 Test Result

Test Mode	Antenna	Frequency[MHz]	FreqRange [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	0~Reference	0.48	0.48	---	PASS
BLE_1M	Ant1	2402	30~1000	0.48	-61.28	≤-19.52	PASS
BLE_1M	Ant1	2402	1000~26500	0.48	-45.77	≤-19.52	PASS
BLE_1M	Ant1	2440	0~Reference	1.69	1.69	---	PASS
BLE_1M	Ant1	2440	30~1000	1.69	-59.77	≤-18.31	PASS
BLE_1M	Ant1	2440	1000~26500	1.69	-43.53	≤-18.31	PASS
BLE_1M	Ant1	2480	0~Reference	1.27	1.27	---	PASS
BLE_1M	Ant1	2480	30~1000	1.27	-60.89	≤-18.73	PASS
BLE_1M	Ant1	2480	1000~26500	1.27	-42.81	≤-18.73	PASS
BLE_2M	Ant1	2402	0~Reference	-0.83	-0.83	---	PASS
BLE_2M	Ant1	2402	30~1000	-0.83	-62.04	≤-20.83	PASS
BLE_2M	Ant1	2402	1000~26500	-0.83	-46.19	≤-20.83	PASS
BLE_2M	Ant1	2440	0~Reference	0.28	0.28	---	PASS
BLE_2M	Ant1	2440	30~1000	0.28	-62.36	≤-19.72	PASS
BLE_2M	Ant1	2440	1000~26500	0.28	-42.78	≤-19.72	PASS
BLE_2M	Ant1	2480	0~Reference	-1.82	-1.82	---	PASS
BLE_2M	Ant1	2480	30~1000	-1.82	-61.81	≤-21.82	PASS
BLE_2M	Ant1	2480	1000~26500	-1.82	-43.37	≤-21.82	PASS

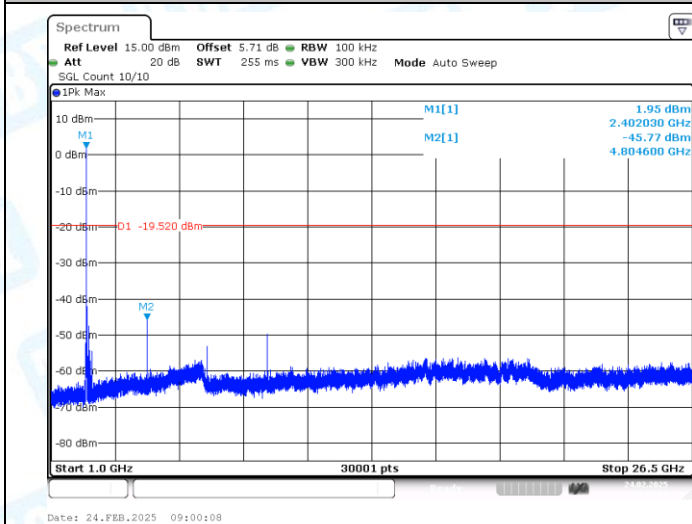
6.2 Test Graphs



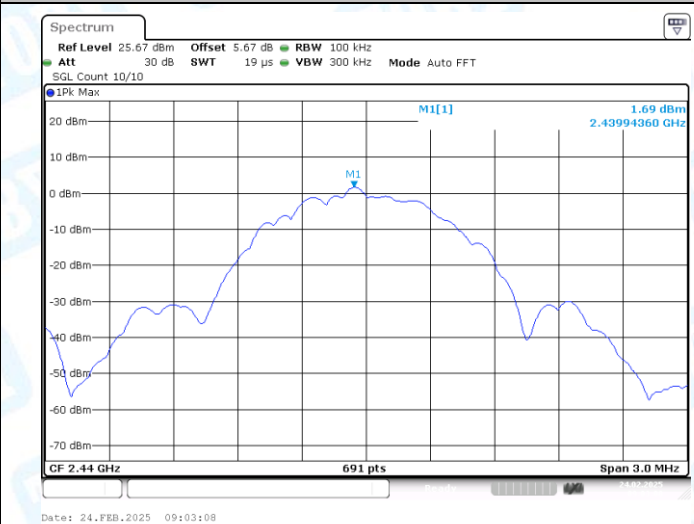
BLE_1M-Ant1-2402-0~Reference-PASS



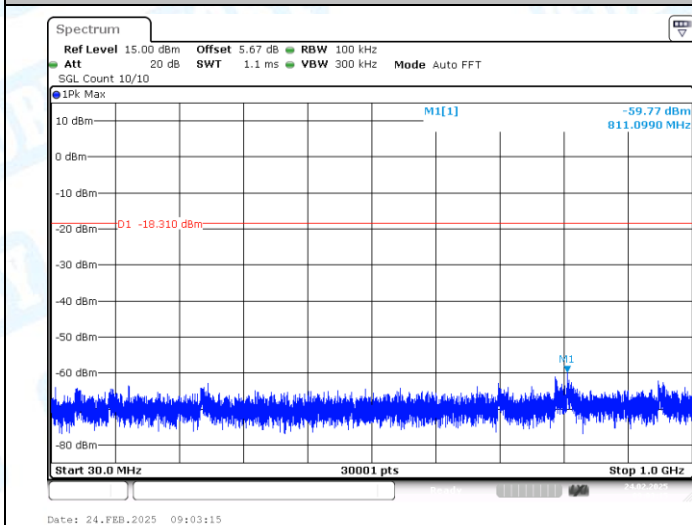
BLE_1M-Ant1-2402-30~1000-PASS



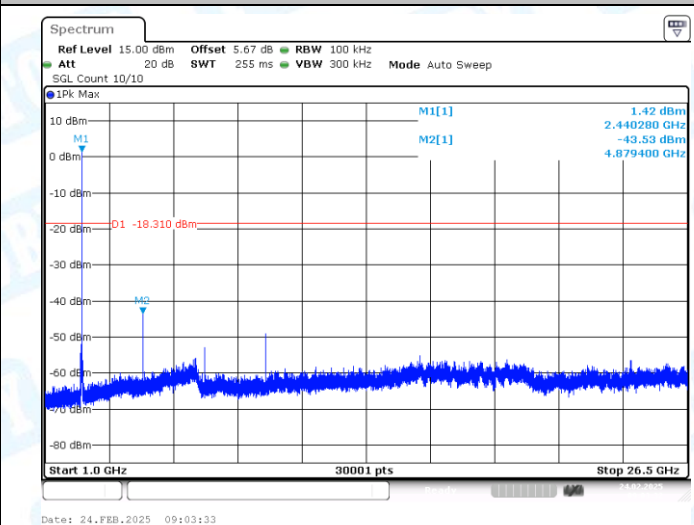
BLE_1M-Ant1-2402-1000~26500-PASS



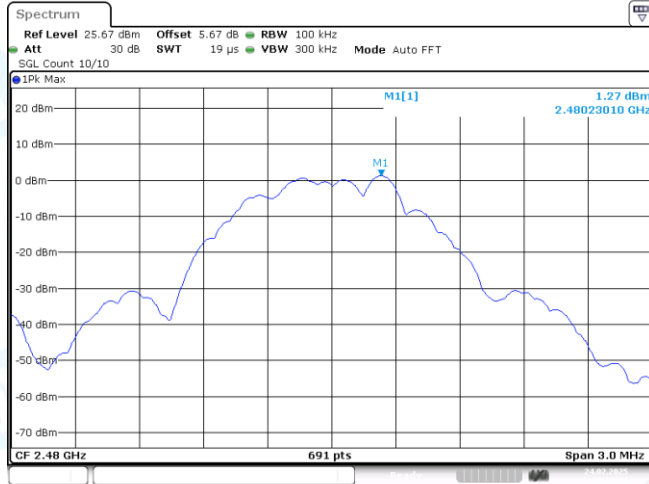
BLE_1M-Ant1-2440-0~Reference-PASS



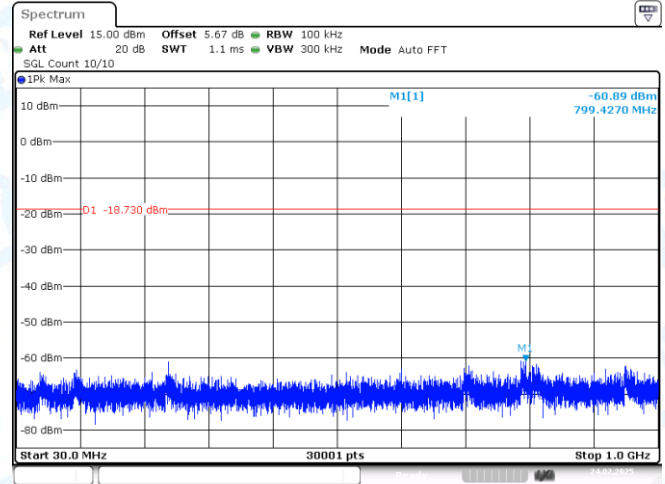
BLE_1M-Ant1-2440-30~1000-PASS



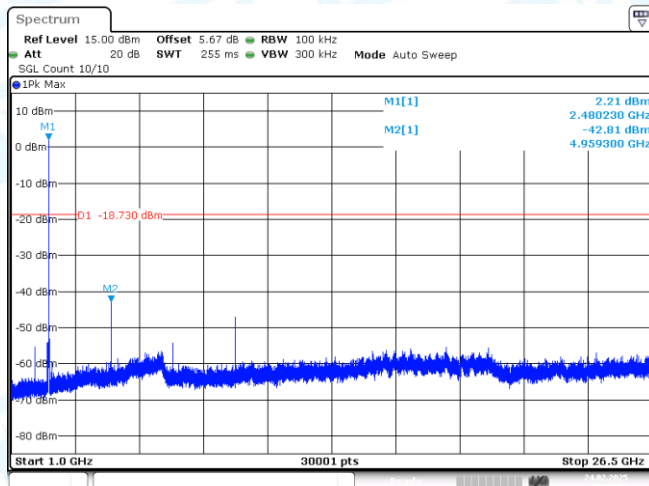
BLE_1M-Ant1-2440-1000~26500-PASS



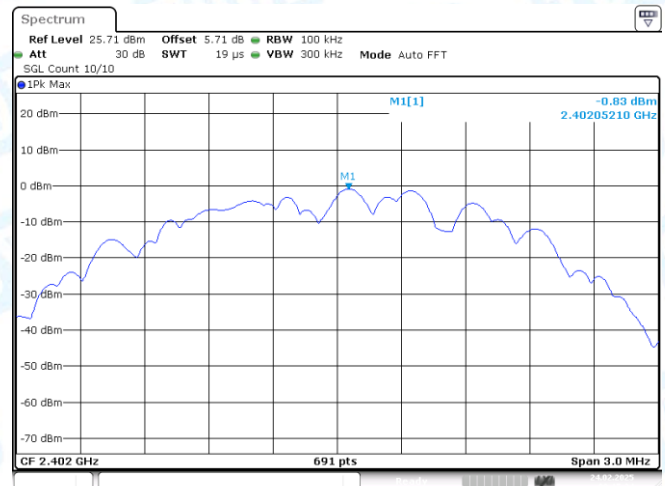
BLE_1M-Ant1-2480-0~Reference-PASS



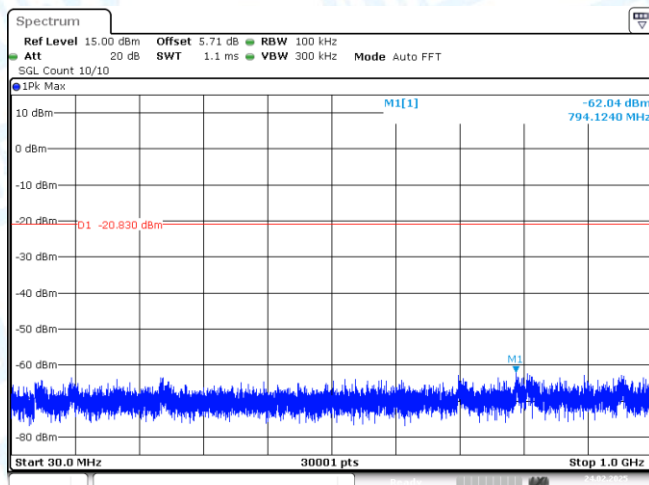
BLE_1M-Ant1-2480-30~1000-PASS



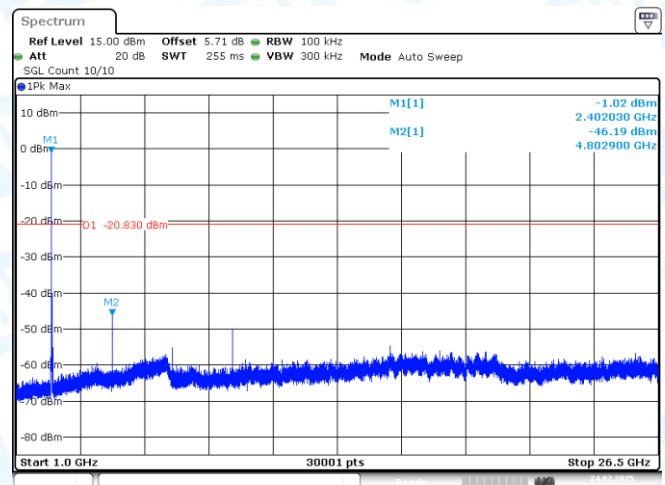
BLE_1M-Ant1-2480-1000~26500-PASS



BLE_2M-Ant1-2402-0~Reference-PASS



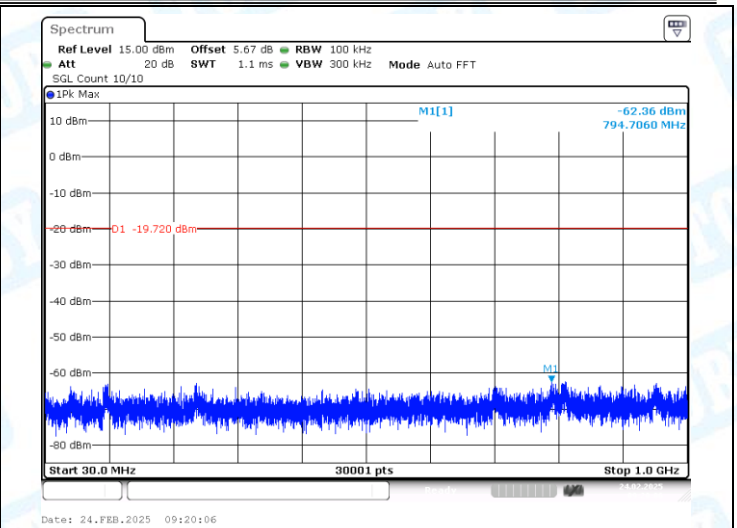
BLE_2M-Ant1-2402-30~1000-PASS



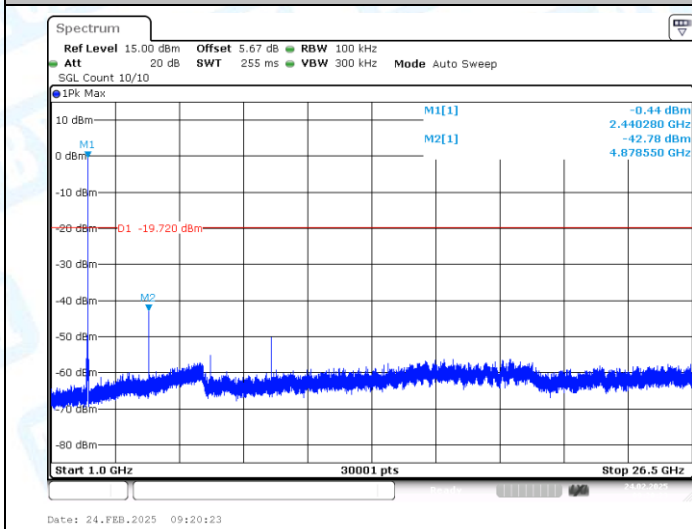
BLE_2M-Ant1-2402-1000~26500-PASS



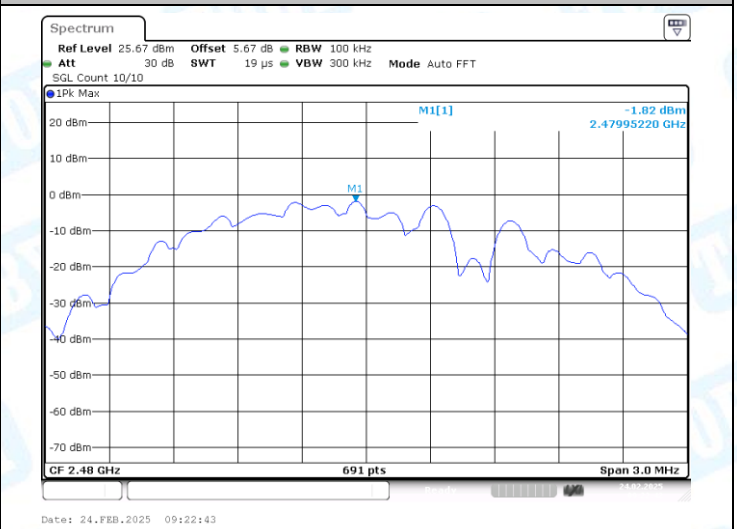
BLE_2M-Ant1-2440-0~Reference-PASS



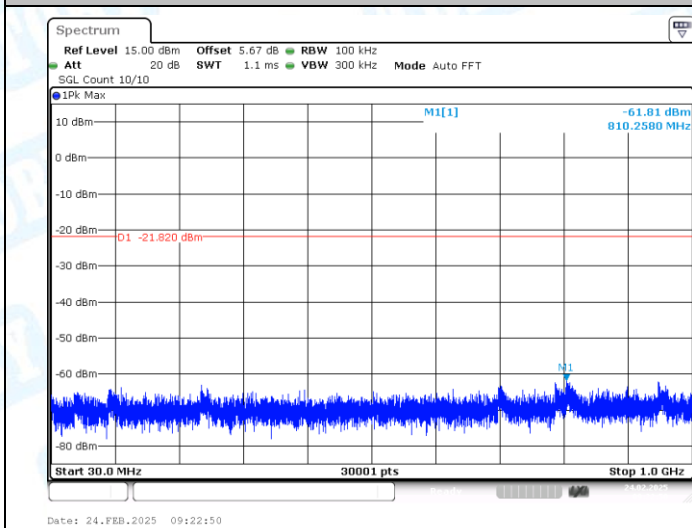
BLE_2M-Ant1-2440-30~1000-PASS



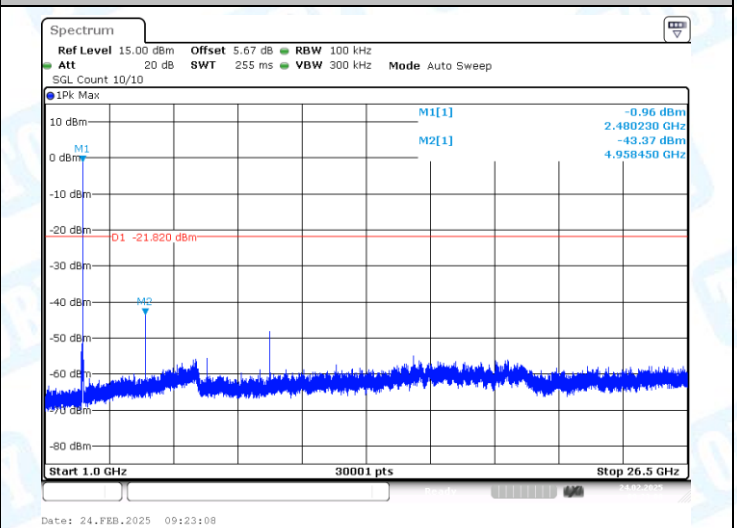
BLE_2M-Ant1-2440-1000~26500-PASS



BLE_2M-Ant1-2480-0~Reference-PASS



BLE_2M-Ant1-2480-30~1000-PASS



BLE_2M-Ant1-2480-1000~26500-PASS

7: Duty Cycle

7.1 Test Result

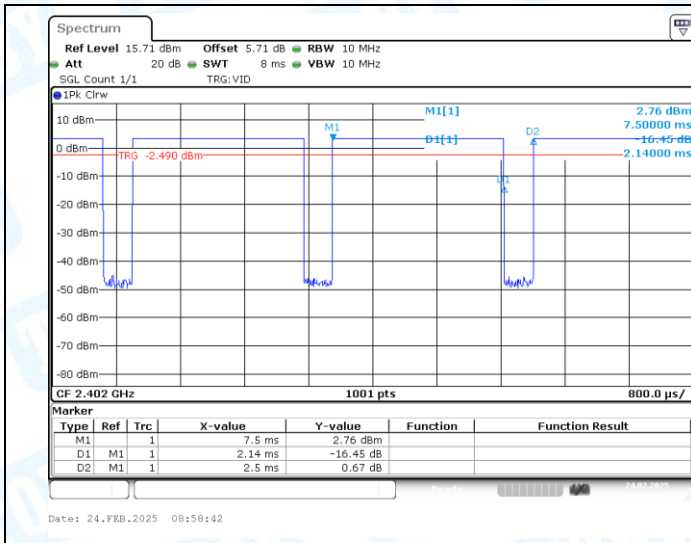
TestMode	Antenna	Frequency [MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	DC Factory	1/T [kHz]
BLE_1M	Ant1	2402	2.14	2.50	85.60	0.68	0.47
BLE_1M	Ant1	2440	2.14	2.50	85.60	0.68	0.47
BLE_1M	Ant1	2480	1.08	1.09	99.08	0.04	0.93
BLE_2M	Ant1	2402	1.08	1.09	99.08	0.04	0.93
BLE_2M	Ant1	2440	1.08	1.09	99.08	0.04	0.93
BLE_2M	Ant1	2480	1.08	1.09	99.08	0.04	0.93

Note: 1, Duty Cycle= Transmission Duration/ Transmission Period

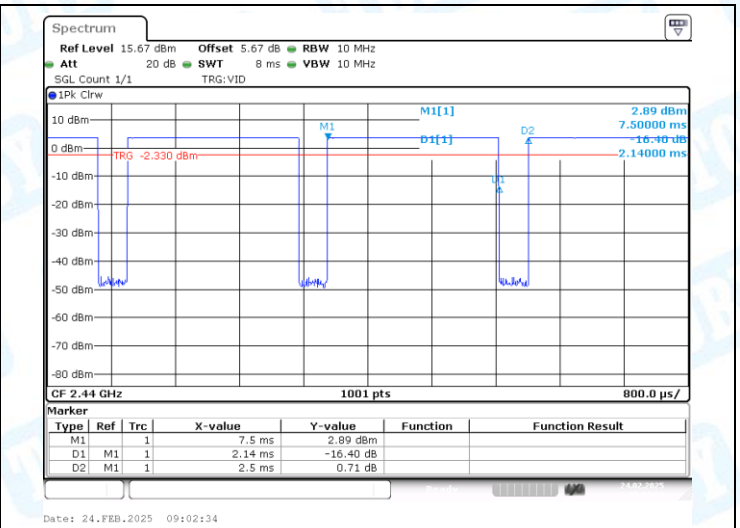
2, DC Factory=10*Log₁₀(1/Duty Cycle)

3, 1/T=1/ Transmission Duration

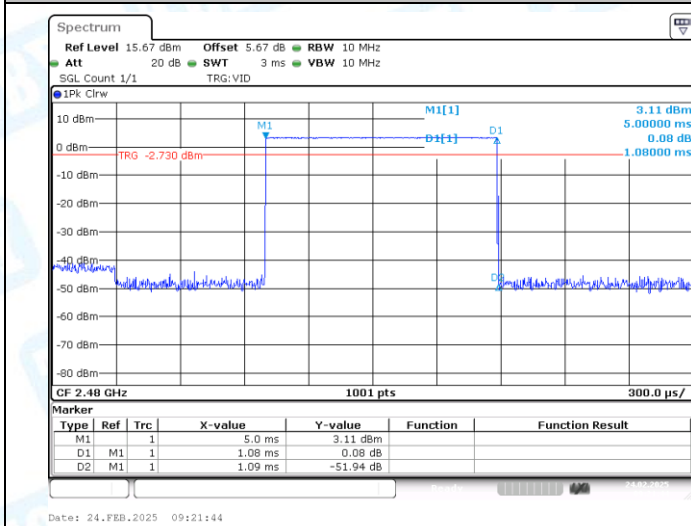
7.2 Test Graphs



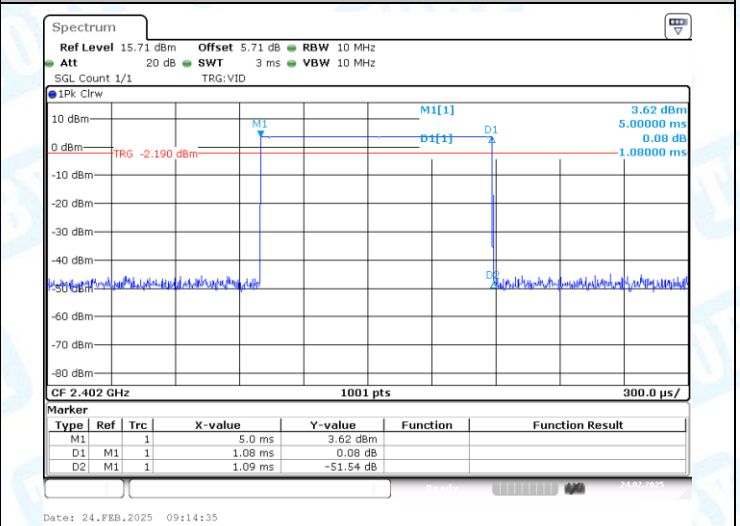
NTVN-BLE_1M-Ant1-2402



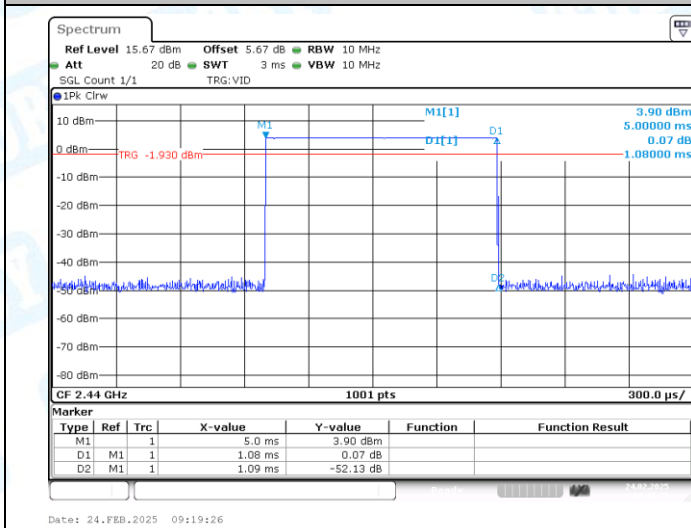
NTVN-BLE_1M-Ant1-2440



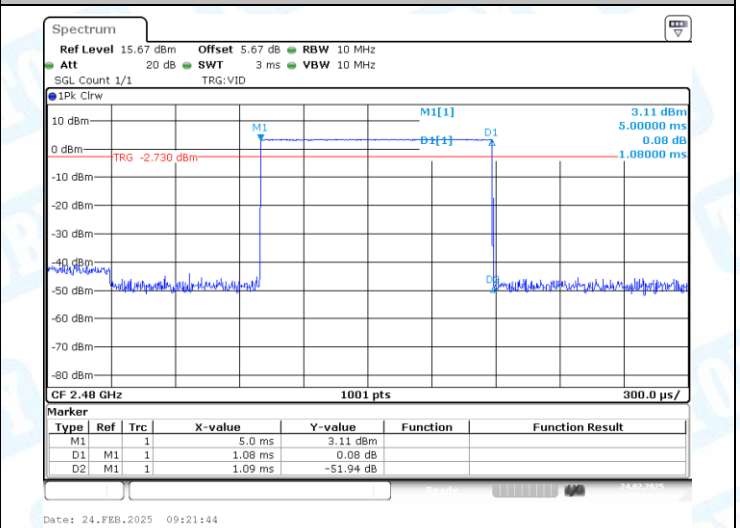
NTVN-BLE_1M-Ant1-2480



NTVN-BLE_2M-Ant1-2402



NTVN-BLE_2M-Ant1-2440



NTVN-BLE_2M-Ant1-2480

8: Emissions in Restricted Bands

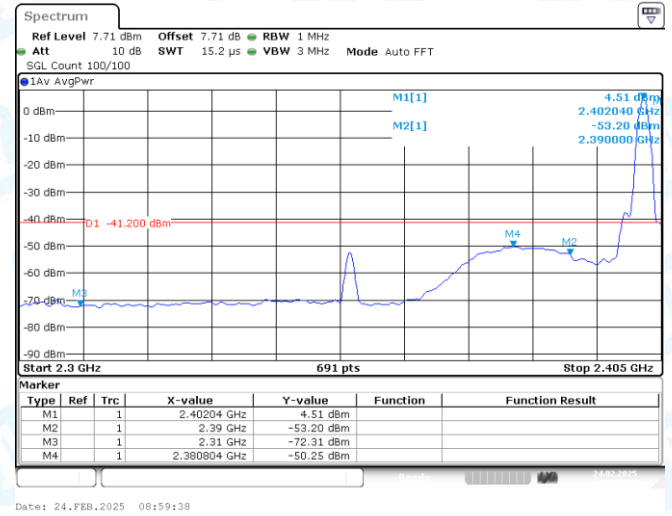
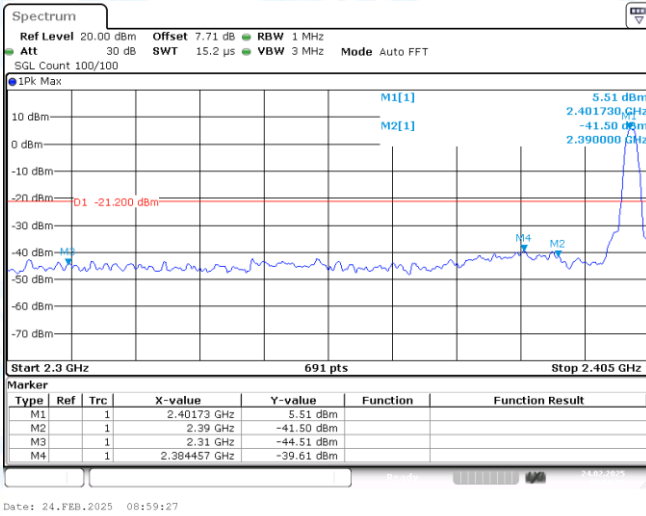
8.1 Test Result

Test Mode	Antenna	ChName	Frequency [MHz]	Detector	Freq [MHz]	Result [dBm]	Limit [dBm]	Result [dBuV/m]	Limit [dBuV/m]	Verdict
BLE_1M	Ant1	Low	2402	Peak	2390.000	-41.5	≤-21.20	53.70	≤74	PASS
BLE_1M	Ant1	Low	2402	Peak	2310.000	-44.51	≤-21.20	50.69	≤74	PASS
BLE_1M	Ant1	Low	2402	Peak	2384.457	-39.61	≤-21.20	55.59	≤74	PASS
BLE_1M	Ant1	Low	2402	AV	2390.000	-53.2	≤-41.20	42.00	≤54	PASS
BLE_1M	Ant1	Low	2402	AV	2310.000	-72.31	≤-41.20	22.89	≤54	PASS
BLE_1M	Ant1	Low	2402	AV	2380.804	-50.25	≤-41.20	44.95	≤54	PASS
BLE_1M	Ant1	High	2480	Peak	2483.500	-33.6	≤-21.20	61.60	≤74	PASS
BLE_1M	Ant1	High	2480	Peak	2500.000	-40.41	≤-21.20	54.79	≤74	PASS
BLE_1M	Ant1	High	2480	Peak	2483.797	-32.71	≤-21.20	62.49	≤74	PASS
BLE_1M	Ant1	High	2480	AV	2483.500	-42.24	≤-41.20	52.96	≤54	PASS
BLE_1M	Ant1	High	2480	AV	2500.000	-52.94	≤-41.20	42.26	≤54	PASS
BLE_1M	Ant1	High	2480	AV	2483.565	-42.45	≤-41.20	52.75	≤54	PASS
BLE_2M	Ant1	Low	2402	Peak	2390.000	-43.05	≤-21.20	52.15	≤74	PASS
BLE_2M	Ant1	Low	2402	Peak	2310.000	-47.06	≤-21.20	48.14	≤74	PASS
BLE_2M	Ant1	Low	2402	Peak	2378.217	-38.38	≤-21.20	56.82	≤74	PASS
BLE_2M	Ant1	Low	2402	AV	2390.000	-55.45	≤-41.20	39.75	≤54	PASS
BLE_2M	Ant1	Low	2402	AV	2310.000	-72.69	≤-41.20	22.51	≤54	PASS
BLE_2M	Ant1	Low	2402	AV	2382.022	-51.12	≤-41.20	44.08	≤54	PASS
BLE_2M	Ant1	High	2480	Peak	2483.500	-35.75	≤-21.20	59.45	≤74	PASS
BLE_2M	Ant1	High	2480	Peak	2500.000	-39.98	≤-21.20	55.22	≤74	PASS
BLE_2M	Ant1	High	2480	Peak	2484.261	-33.59	≤-21.20	61.61	≤74	PASS
BLE_2M	Ant1	High	2480	AV	2483.500	-45.39	≤-41.20	49.81	≤54	PASS
BLE_2M	Ant1	High	2480	AV	2500.000	-52.71	≤-41.20	42.49	≤54	PASS
BLE_2M	Ant1	High	2480	AV	2484.261	-42.18	≤-41.20	53.02	≤54	PASS

Note:

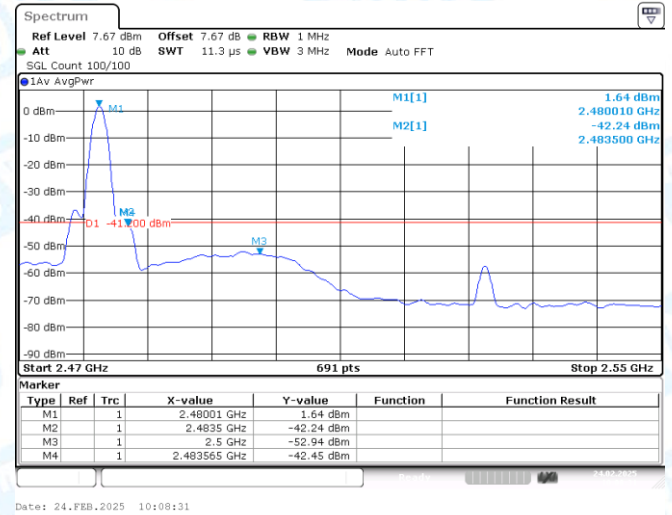
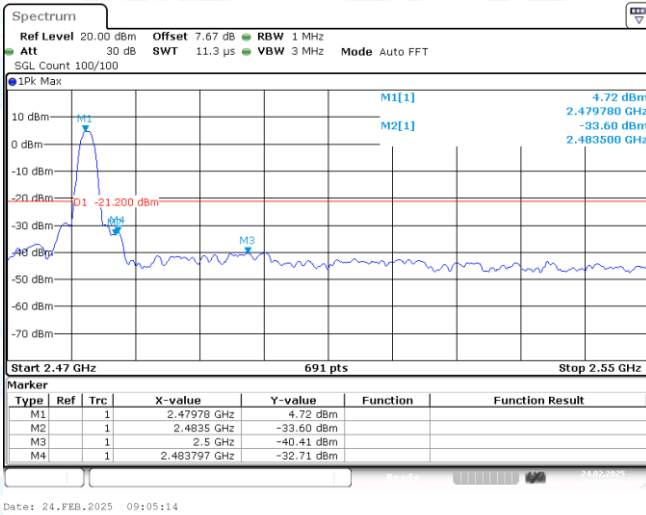
1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

8.2 Test Graphs



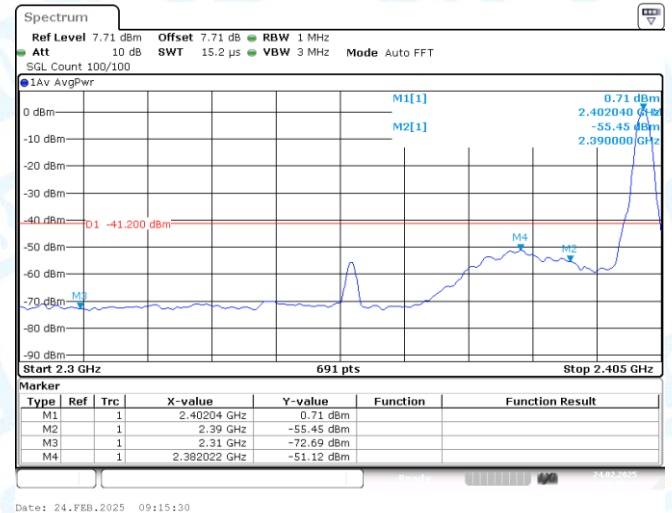
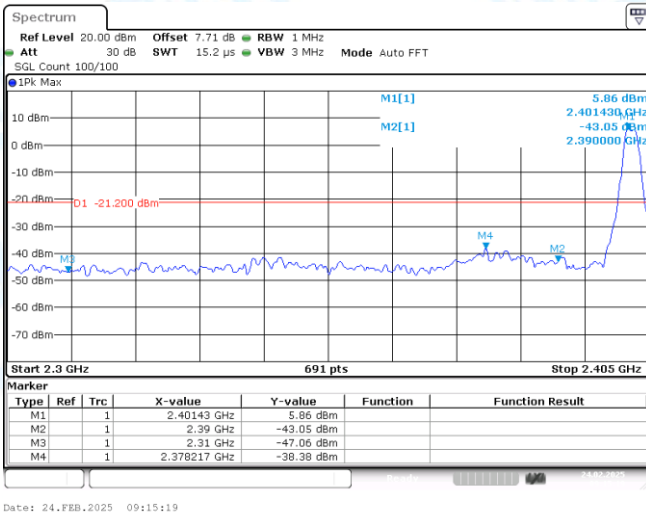
BLE_1M-Ant1-2402-PASS

BLE_1M-Ant1-2402-PASS



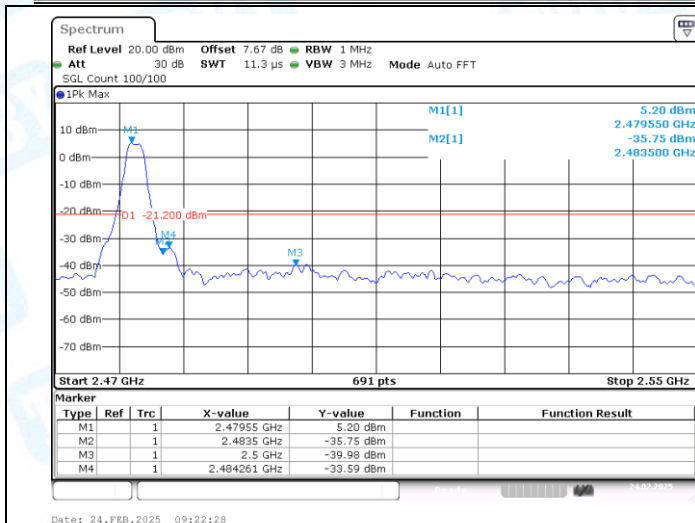
BLE_1M-Ant1-2480-PASS

BLE_1M-Ant1-2480-PASS

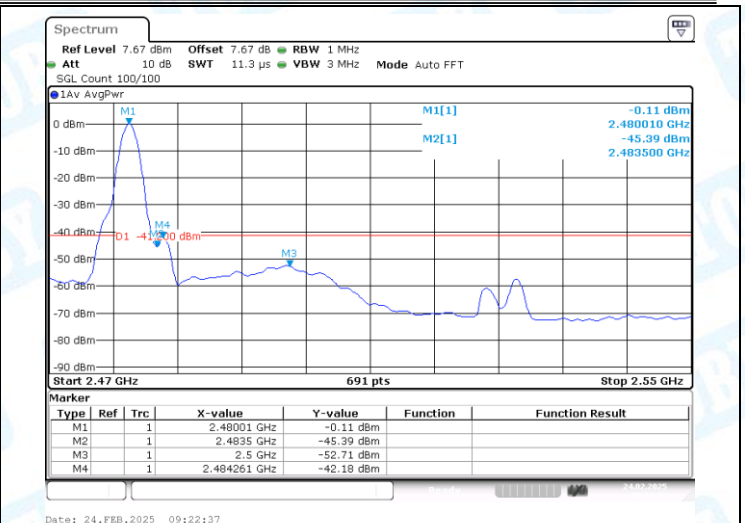


BLE_2M-Ant1-2402-PASS

BLE_2M-Ant1-2402-PASS



BLE_2M-Ant1-2480-PASS



BLE_2M-Ant1-2480-PASS

-----END OF THE REPORT-----