

RF Test Data for Bluetooth LE (Conducted Measurements)

General Description of EUT	
Product Name:	Heltec WiFi Kit LoRa Node
Test Model:	HTIT-WS
Sample ID:	RW-C-202202-0173-1-2#
Environmental Conditions	
Temperature:	23.8°C
Relative Humidity:	48%
Test Voltage:	DC 5V
Test Engineer:	Huang jian ping
Note: For a more detailed features description, please refer to the report TBR-C-202202-0173-13	

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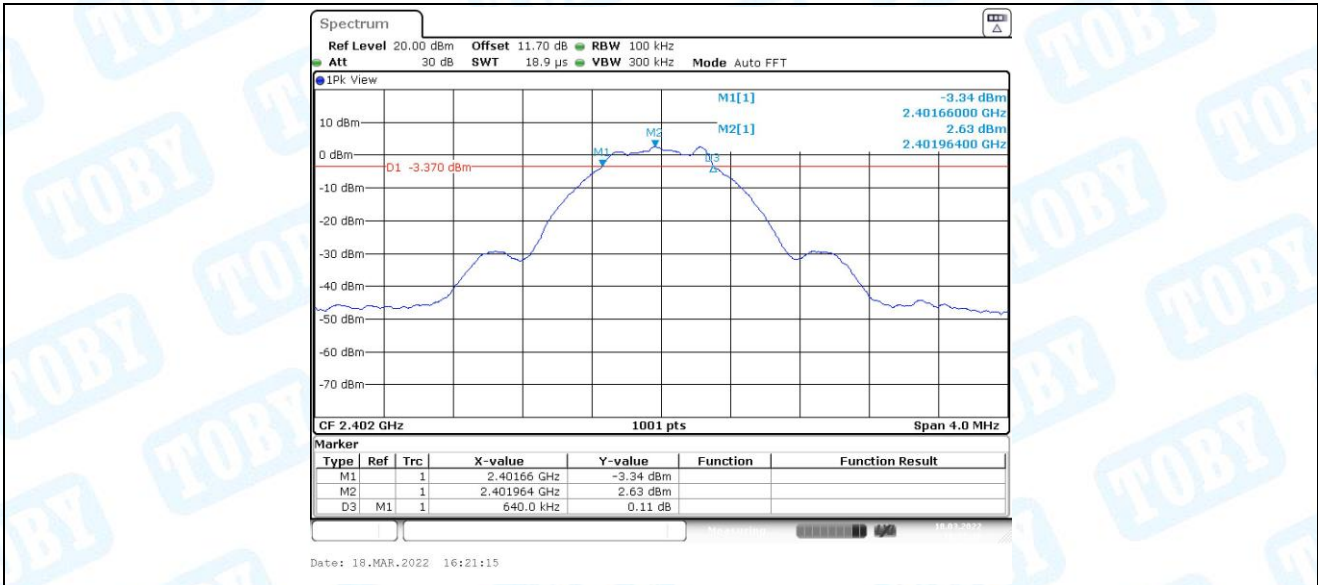
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1. DTS Bandwidth

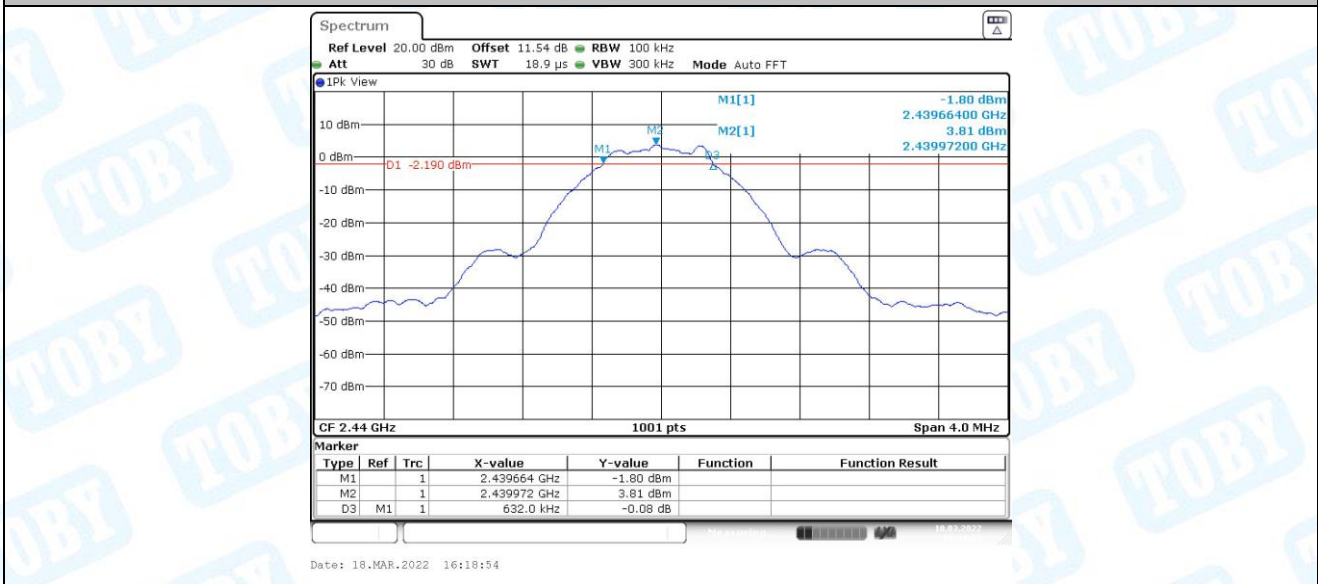
1.1. Test Result

Test Mode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.64	2401.66	2402.30	0.5	PASS
		2440	0.63	2439.66	2440.30	0.5	PASS
		2480	0.64	2479.66	2480.30	0.5	PASS

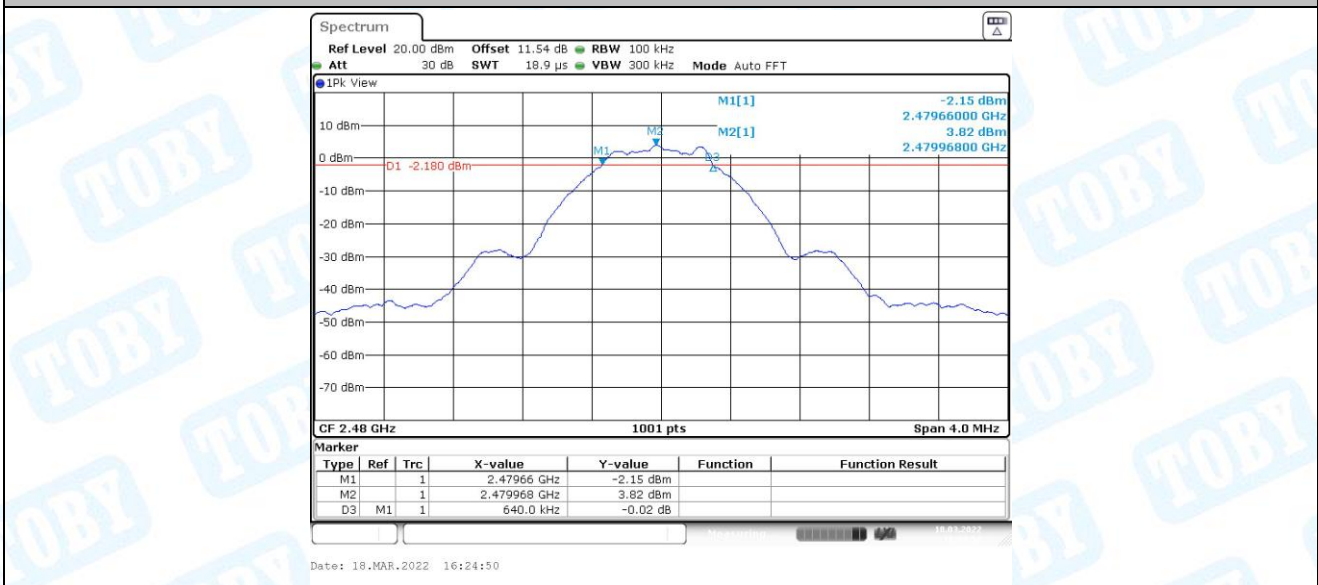
1.2. Test Graphs



BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



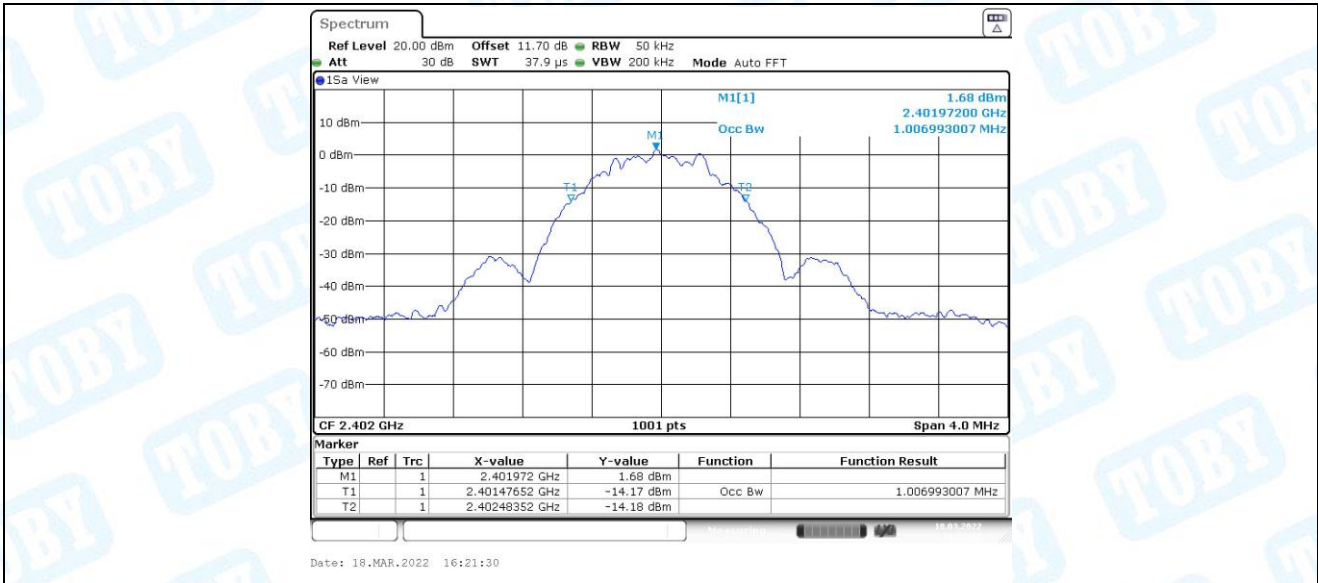
BLE_1M_Ant1_2480

2. Occupied Channel Bandwidth

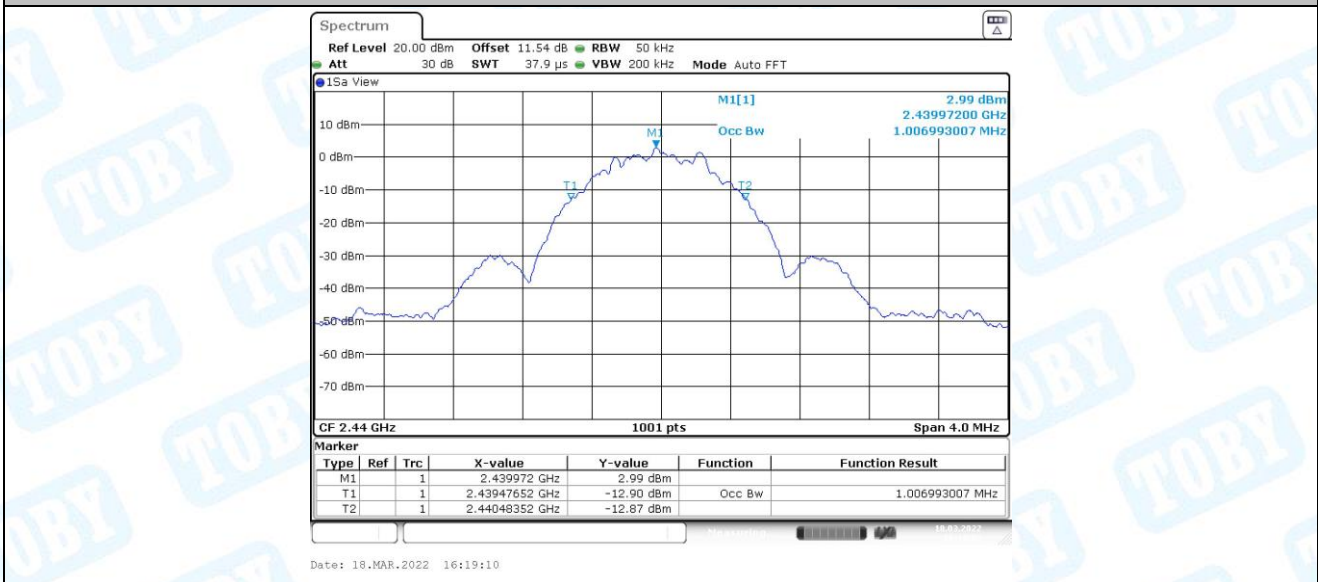
2.1. Test Result

Test Mode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	1.007	2401.477	2402.484	---	---
		2440	1.007	2439.477	2440.484	---	---
		2480	1.007	2479.477	2480.484	---	---

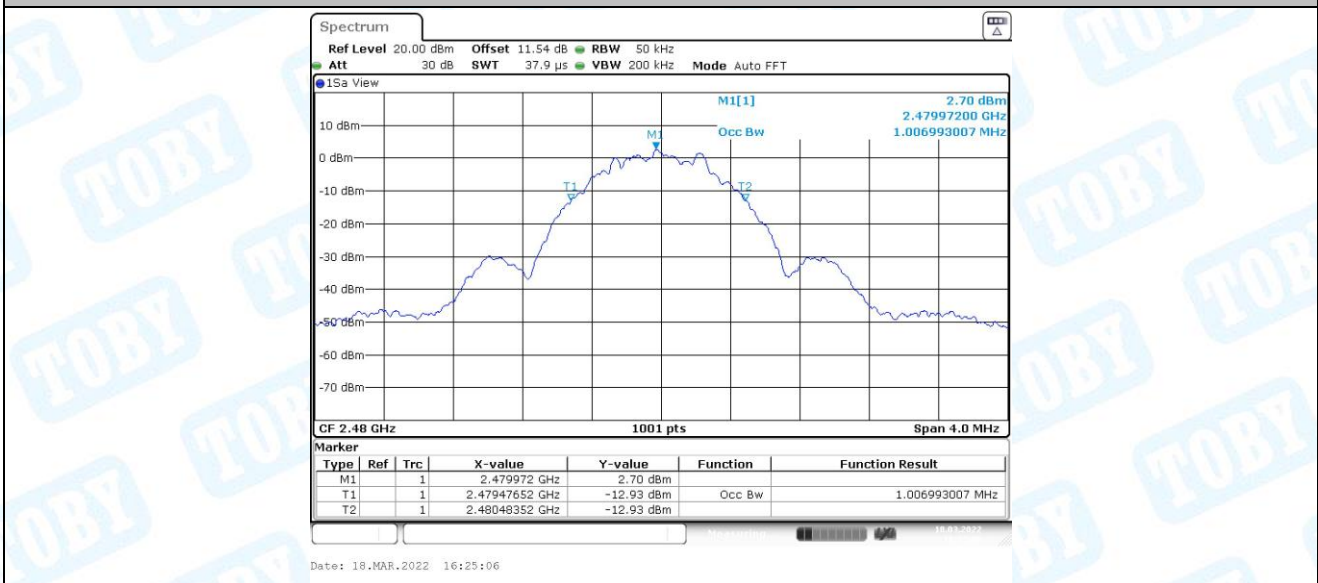
2.2. Test Graphs



BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



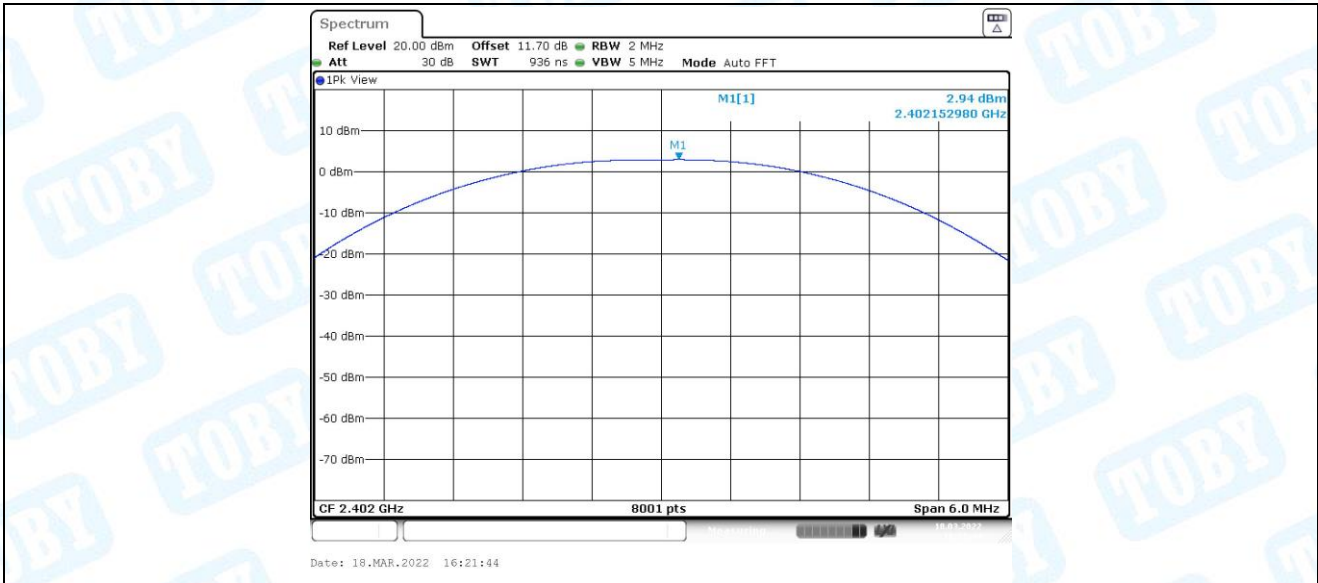
BLE_1M_Ant1_2480

3. Maximum conducted output power

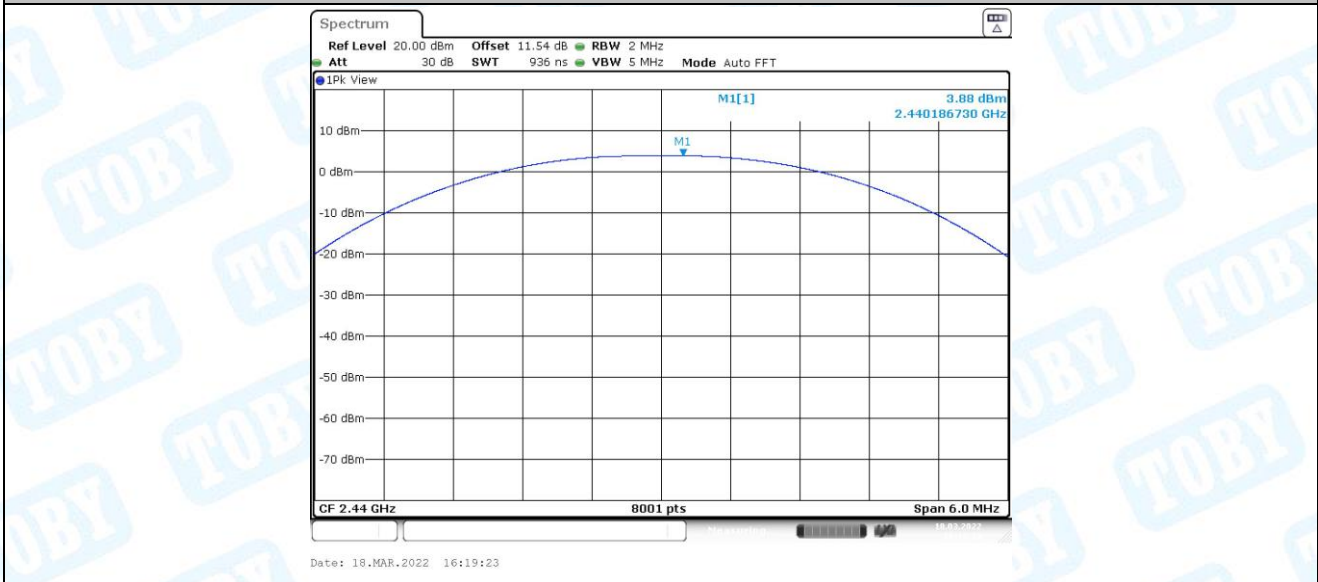
3.1. Test Result

Test Mode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	2.94	≤30	PASS
		2440	3.88	≤30	PASS
		2480	4.08	≤30	PASS

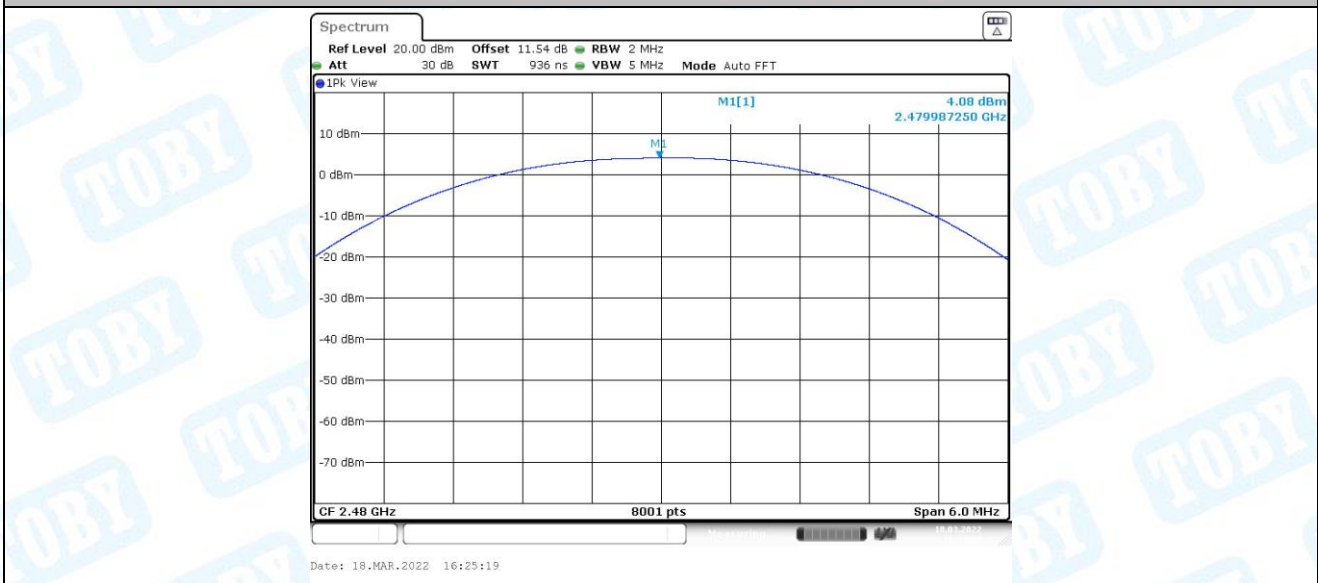
3.2. Test Graphs



BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



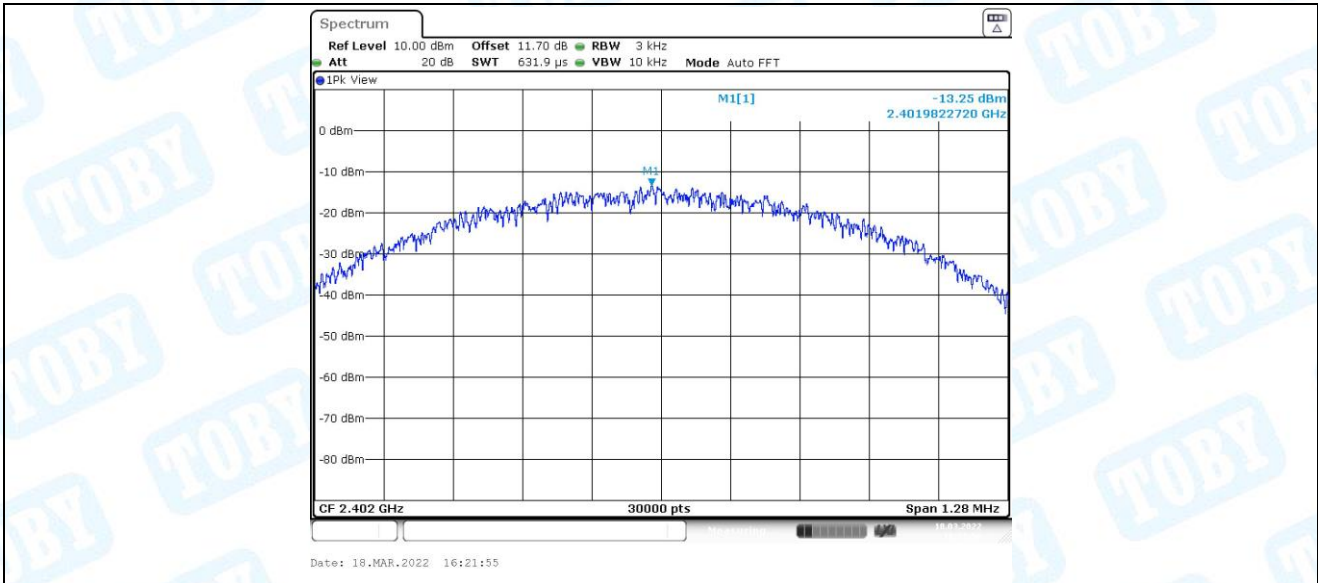
BLE_1M_Ant1_2480

4. Maximum power spectral density

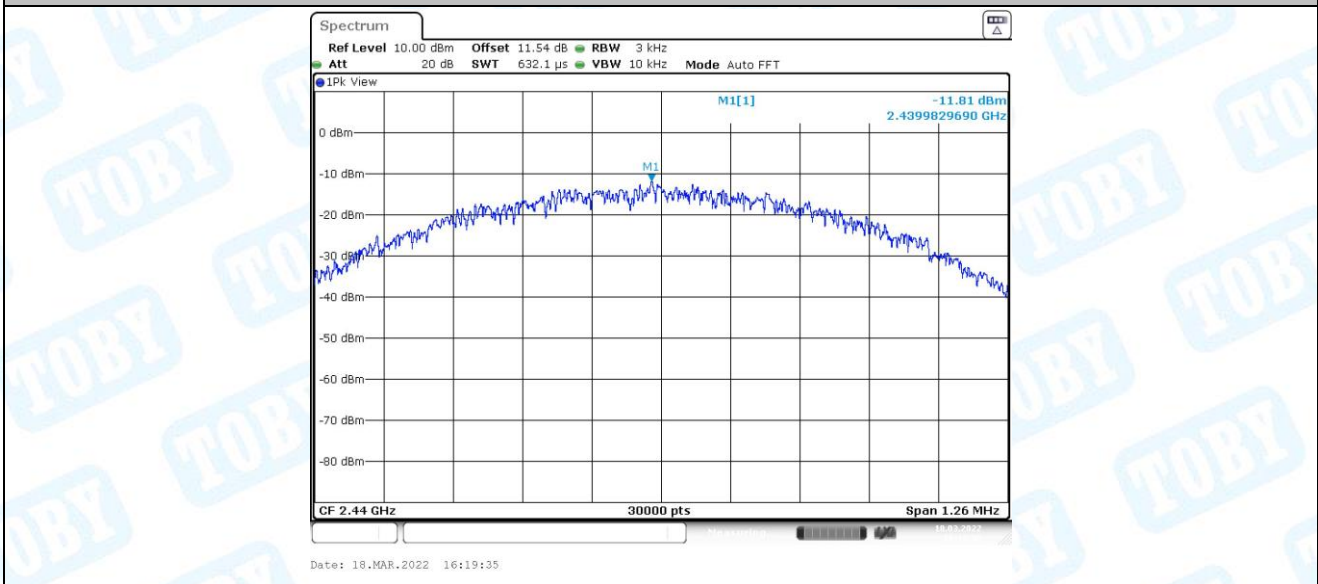
4.1. Test Result

Test Mode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-13.25	≤8.00	PASS
		2440	-11.81	≤8.00	PASS
		2480	-11.59	≤8.00	PASS

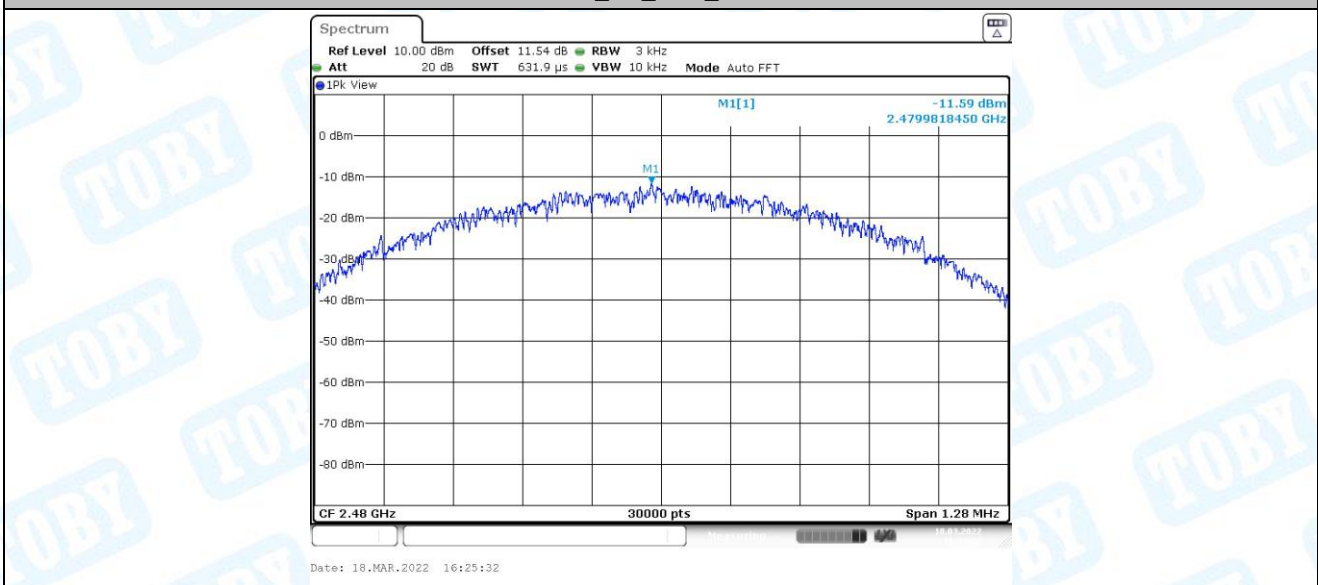
4.2. Test Graphs



BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



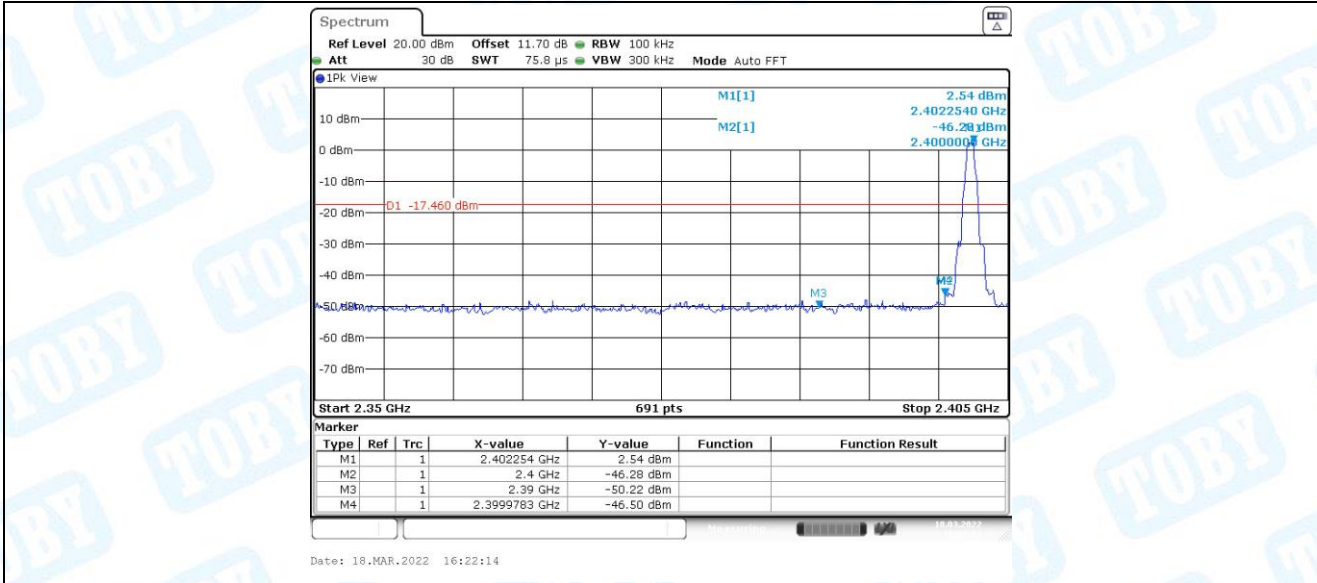
BLE_1M_Ant1_2480

5. Band edge measurements

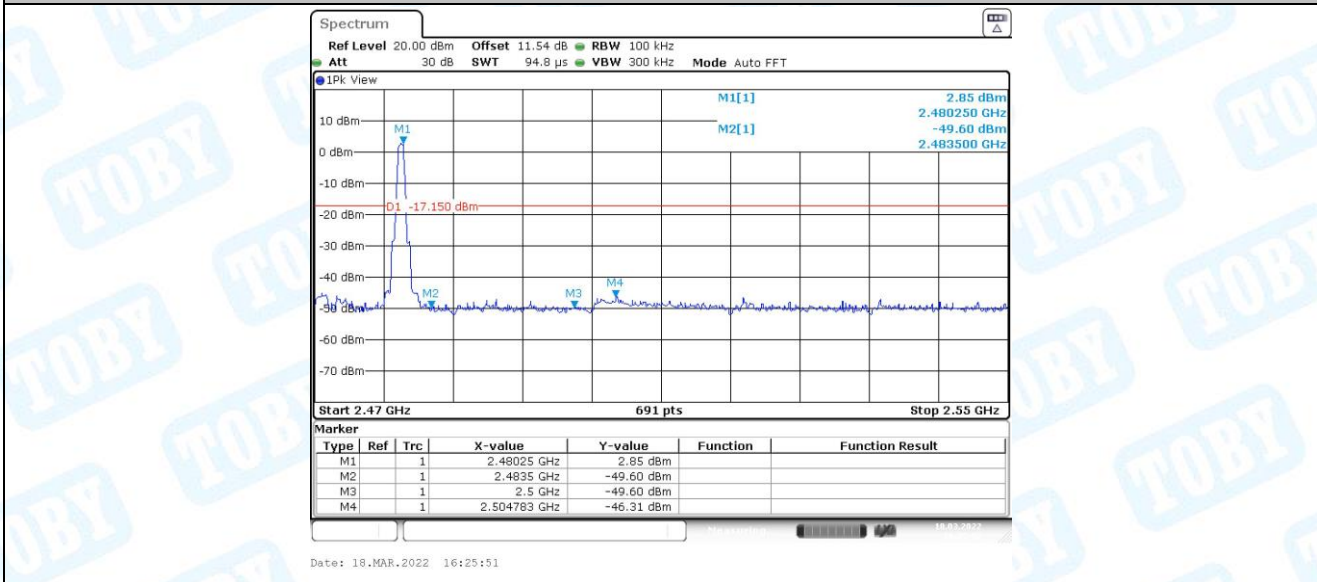
5.1. Test Result

Test Mode	Antenna	ChName	Channel	Ref.Level[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	2.54	-46.5	≤-17.46	PASS
		High	2480	2.85	-46.31	≤-17.15	PASS

5.2. Test Graphs



BLE_1M_Ant1_Low_2402



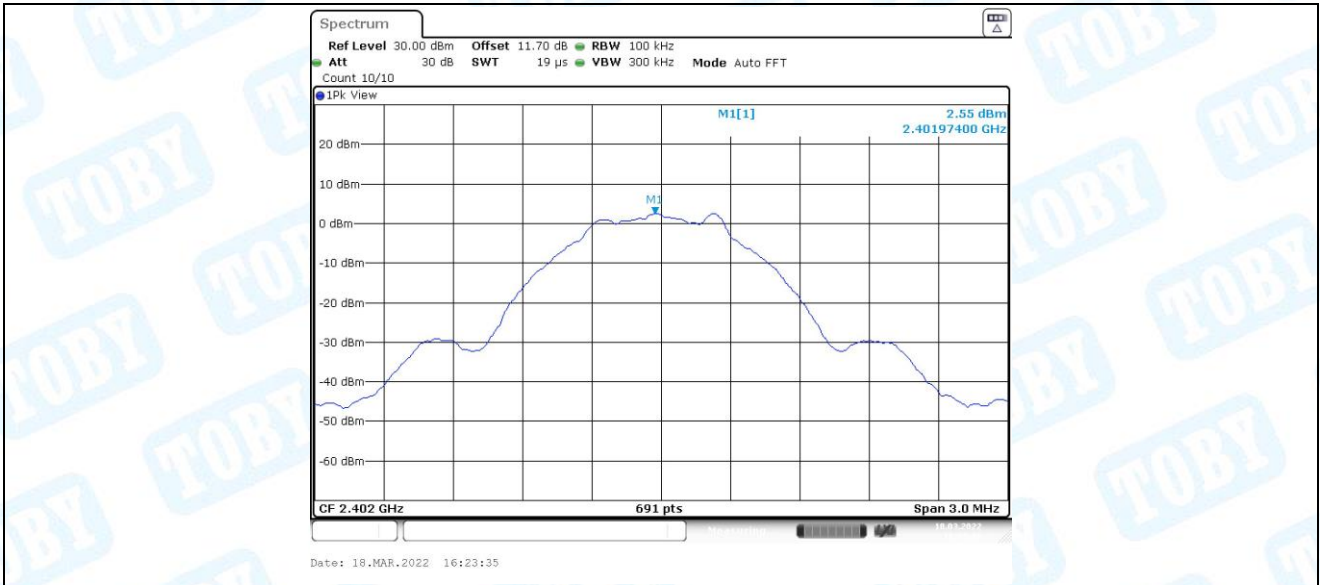
BLE_1M_Ant1_High_2480

6. Conducted Spurious Emission

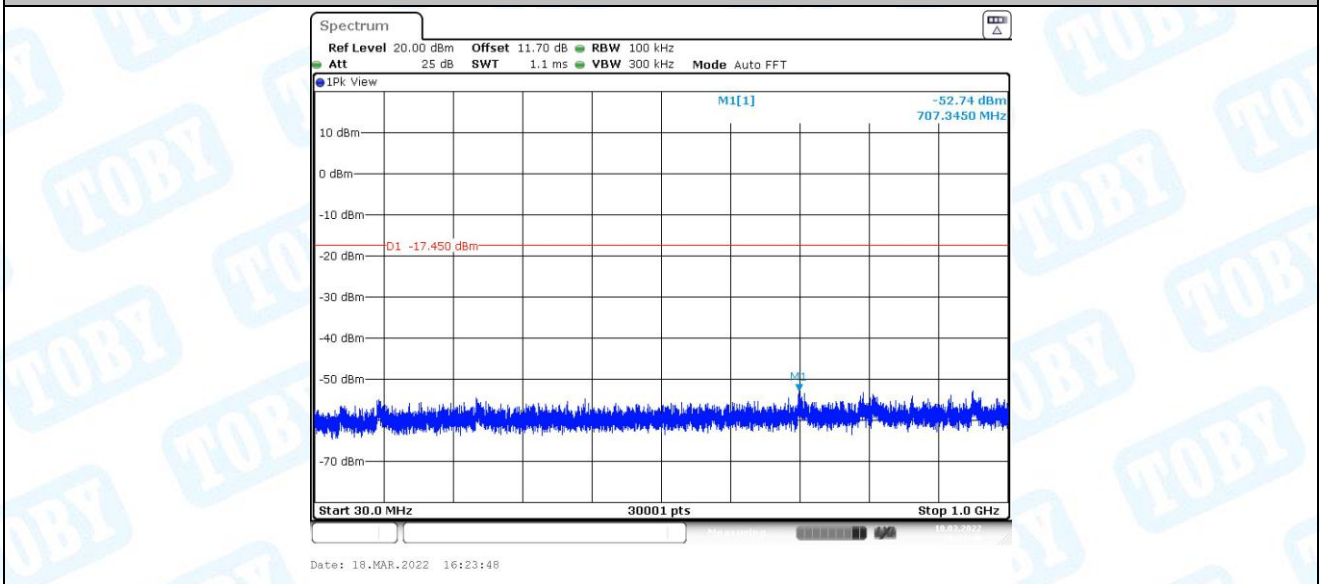
6.1. Test Result

Test Mode	Antenna	Channel	Freq. Range [MHz]	Ref. Level [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	2.55	2.55	---	PASS
			30~1000	2.55	-52.74	≤-17.45	PASS
			1000~26500	2.55	-37.92	≤-17.45	PASS
		2440	Reference	3.71	3.71	---	PASS
			30~1000	3.71	-50.69	≤-16.29	PASS
			1000~26500	3.71	-39.66	≤-16.29	PASS
		2480	Reference	3.81	3.81	---	PASS
			30~1000	3.81	-53.06	≤-16.19	PASS
			1000~26500	3.81	-44.18	≤-16.19	PASS

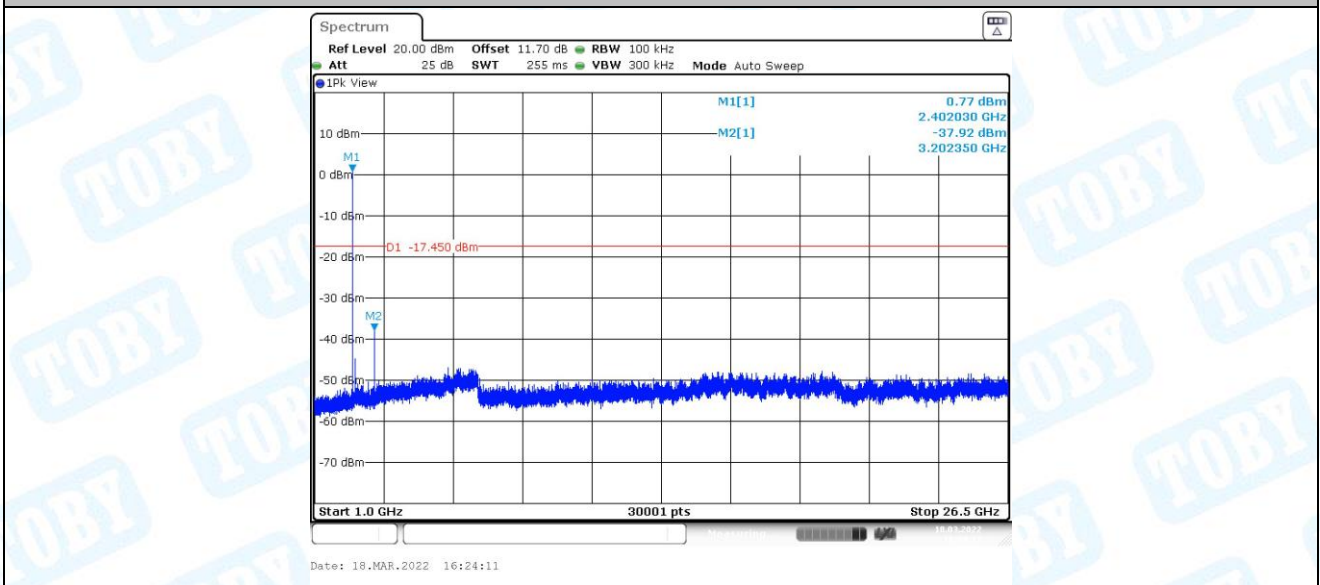
6.2. Test Graphs



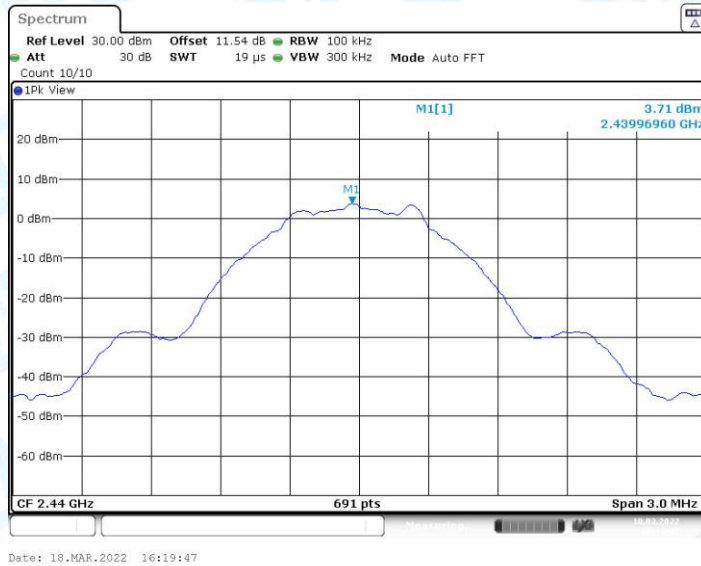
BLE_1M_Ant1_2402_0~Reference



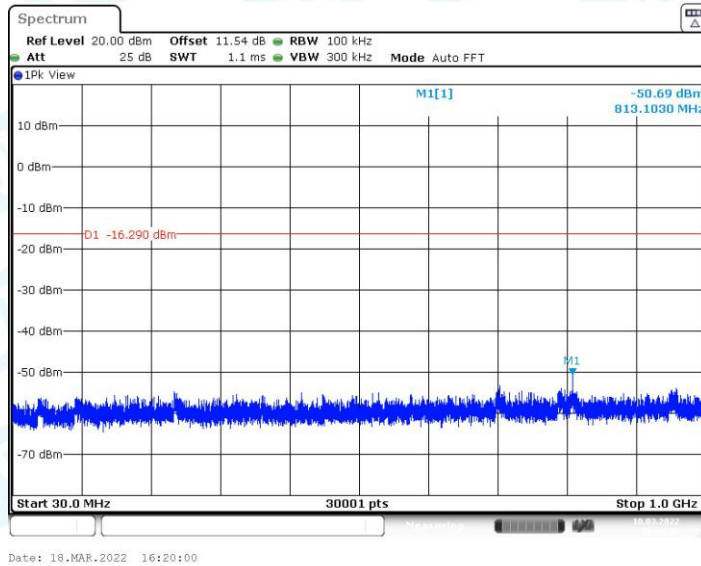
BLE_1M_Ant1_2402_30~1000



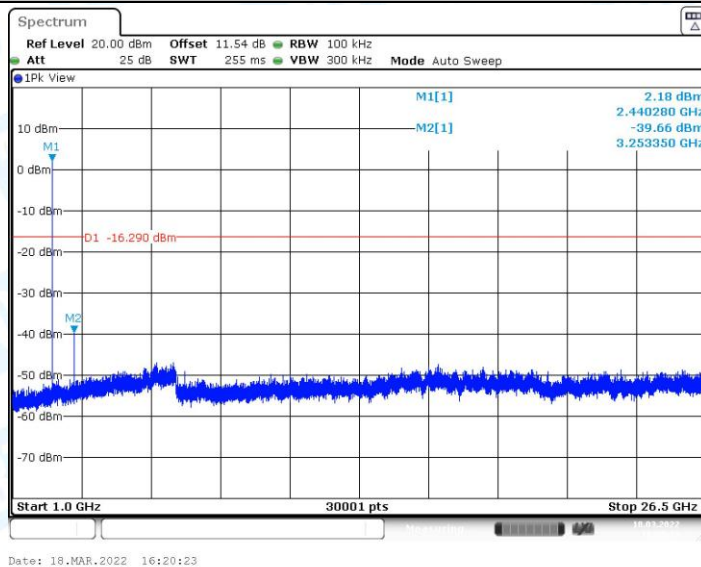
BLE_1M_Ant1_2402_1000~26500



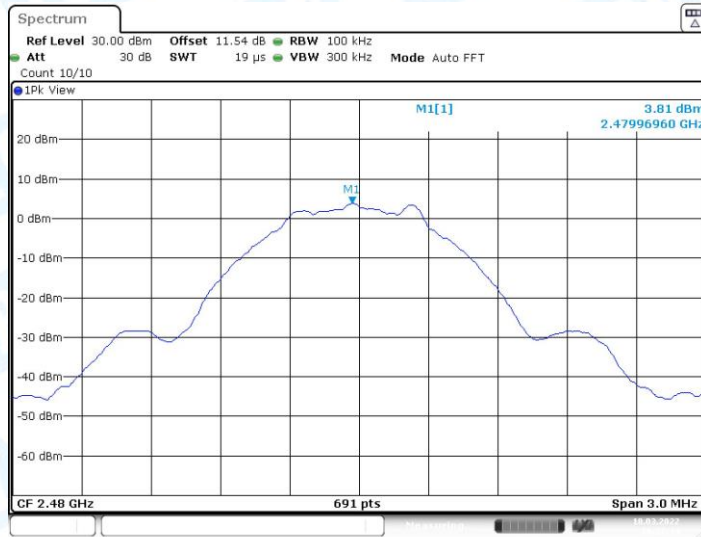
BLE_1M_Ant1_2440_0~Reference



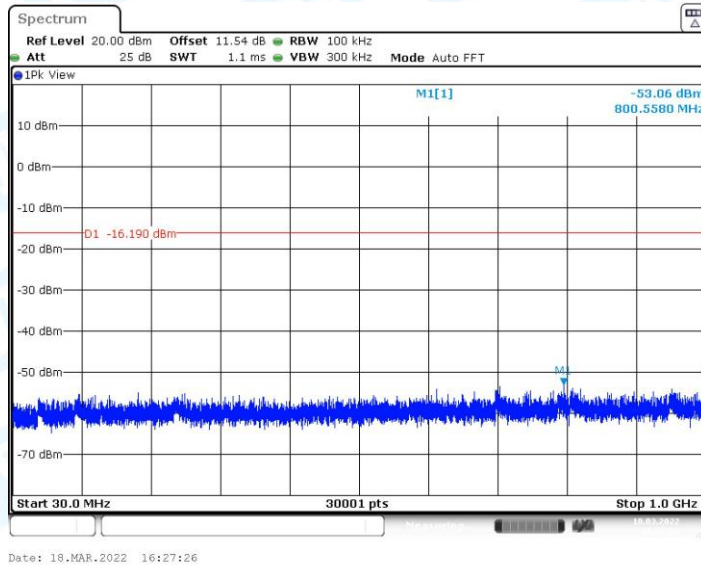
BLE_1M_Ant1_2440_30~1000



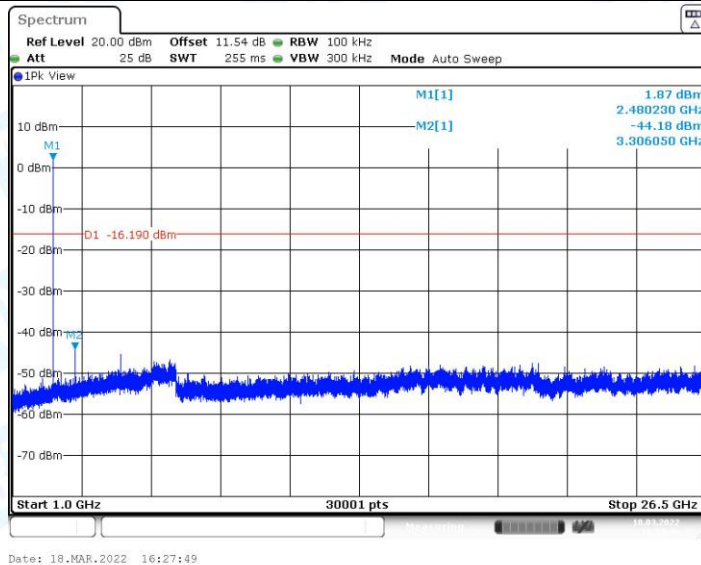
BLE_1M_Ant1_2440_1000~26500



BLE_1M_Ant1_2480_0~Reference



BLE_1M_Ant1_2480_30~1000



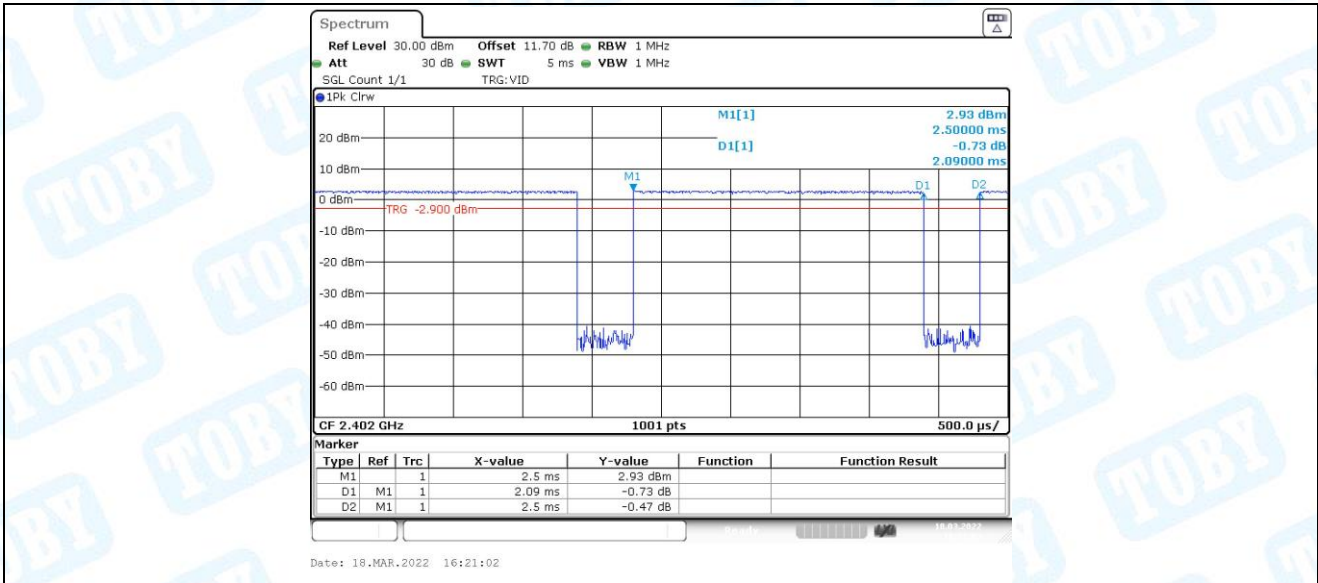
BLE_1M_Ant1_2480_1000~26500

7. Duty Cycle

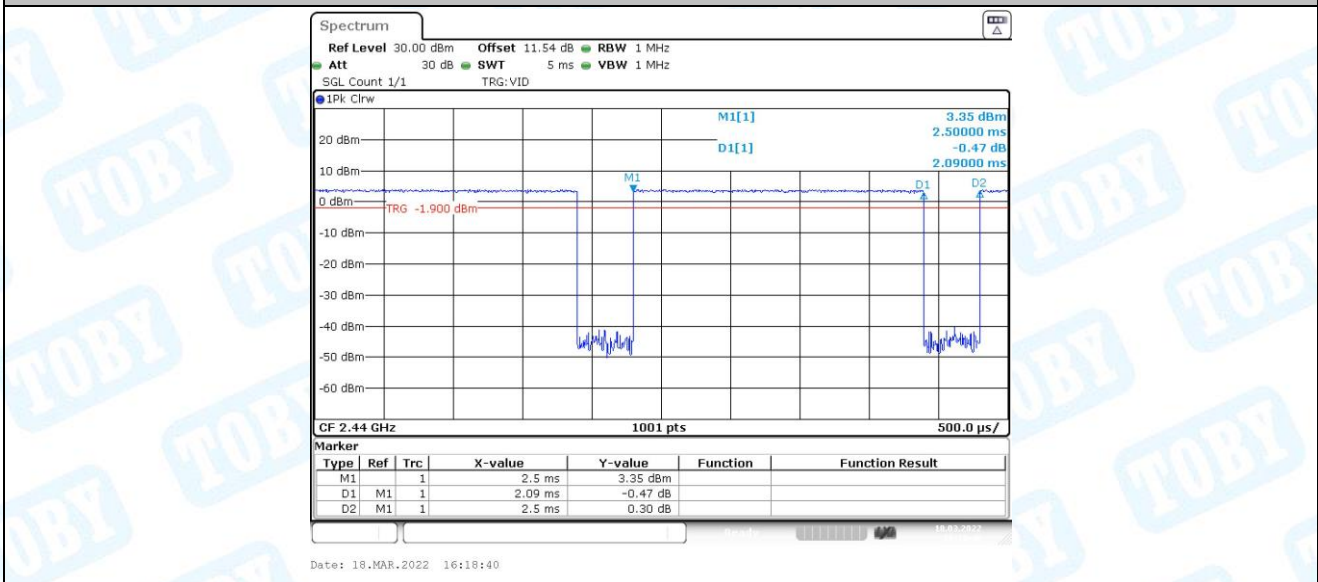
7.1. Test Result

Test Mode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	1/T [KHz]	Limit	Verdict
BLE_1M	Ant1	2402	2.09	2.50	83.60	0.478	---	---
		2440	2.09	2.50	83.60	0.478	---	---
		2480	2.09	3.13	66.77	0.478	---	---

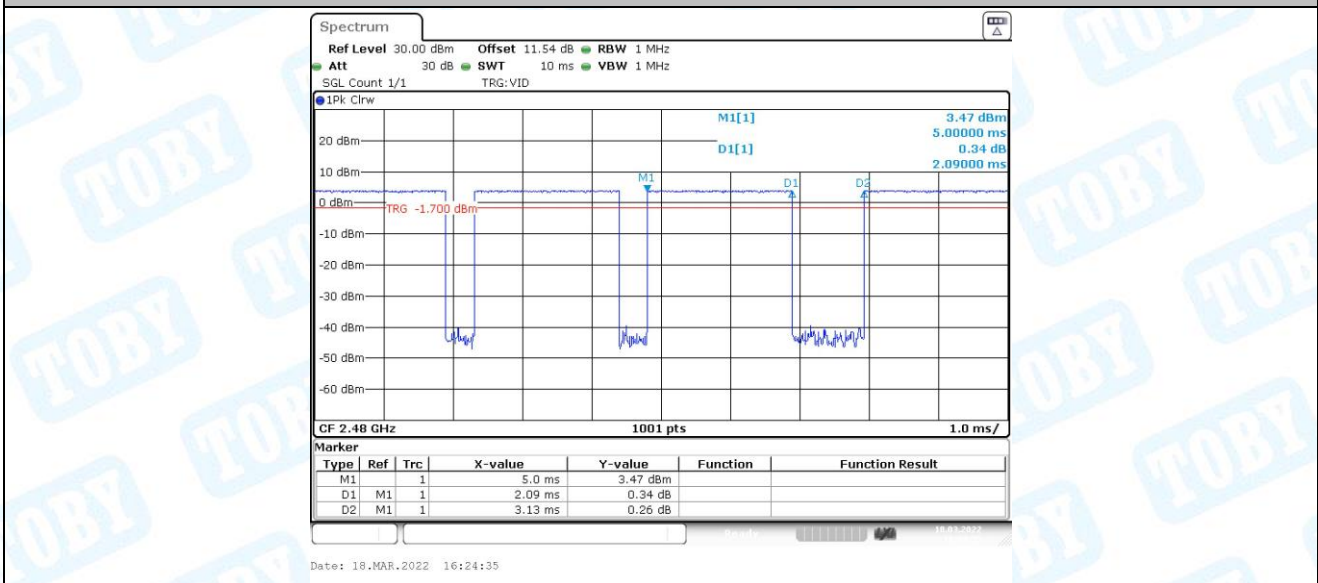
7.2. Test Graphs



BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



BLE_1M_Ant1_2480

8. Emissions in Restricted Bands

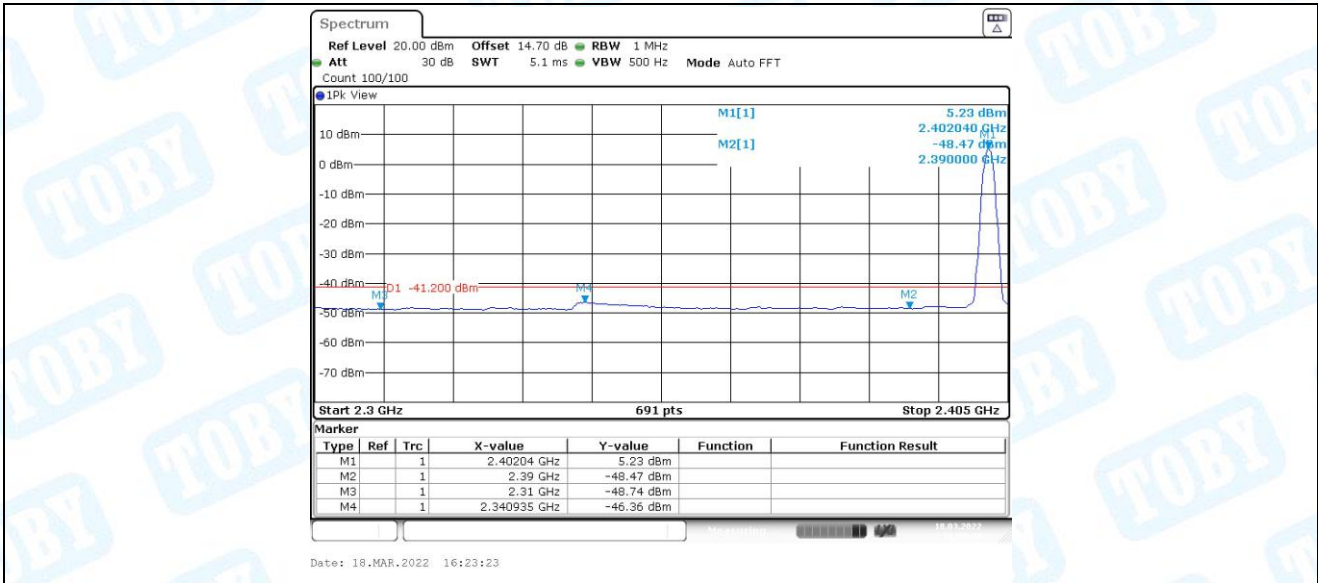
8.1. Test Result

Test Mode	Antenna	ChName	Channel	Detector	Freq. [MHz]	Result [dBm]	Limit [dBm]	Verdict
BLE_1M	Ant1	Low	2402	AV	2310.000	-48.74	≤-41.20	PASS
				AV	2340.935	-46.36	≤-41.20	PASS
				AV	2390.000	-48.47	≤-41.20	PASS
				Peak	2310.000	-38.82	≤-21.20	PASS
				Peak	2341.239	-33.99	≤-21.20	PASS
				Peak	2390.000	-37.84	≤-21.20	PASS
		High	2480	AV	2483.500	-47.7	≤-41.20	PASS
				AV	2485.420	-47.35	≤-41.20	PASS
				AV	2500.000	-47.72	≤-41.20	PASS
				Peak	2483.500	-36.8	≤-21.20	PASS
				Peak	2487.275	-35.68	≤-21.20	PASS
				Peak	2500.000	-36.88	≤-21.20	PASS

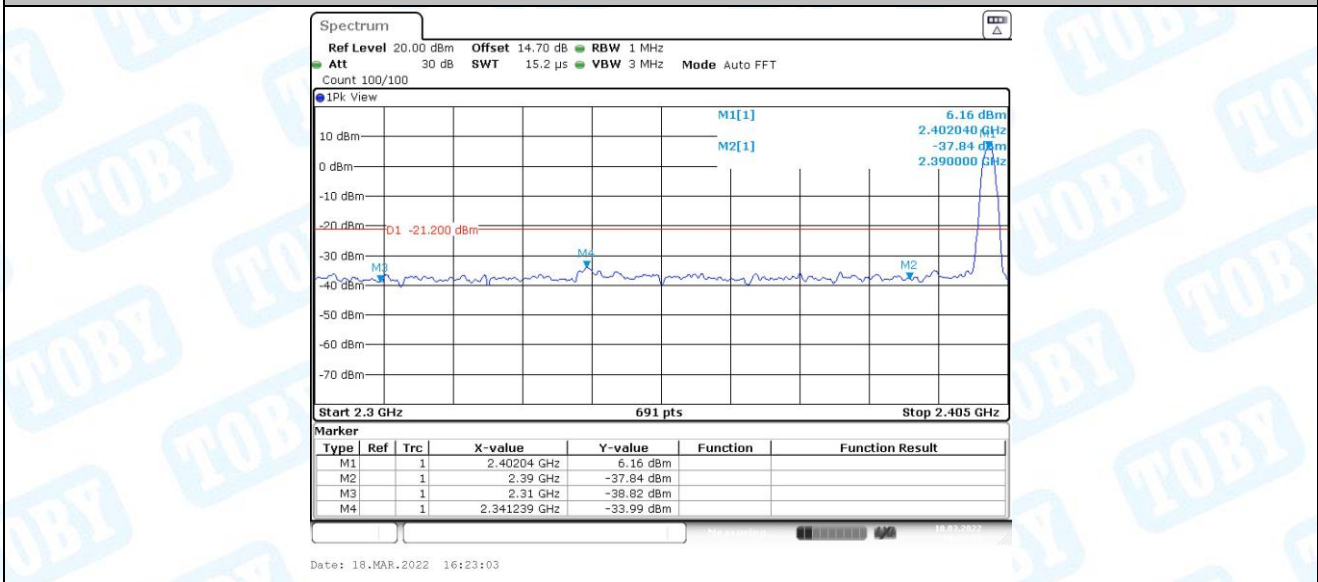
Note:

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.

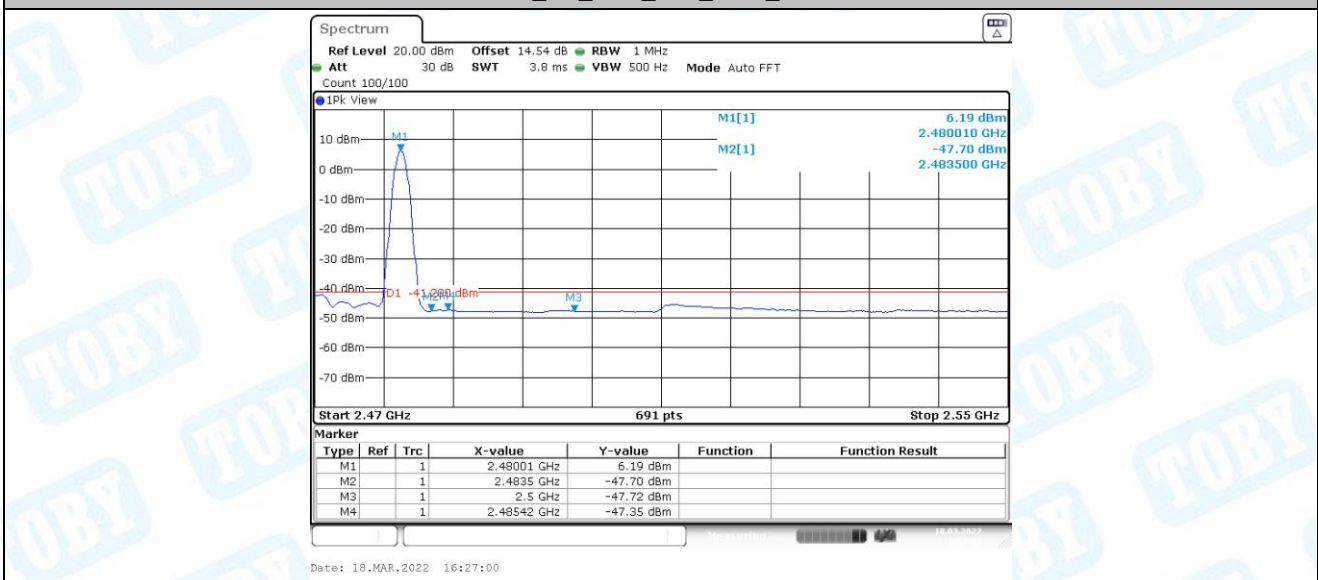
8.2. Test Graphs



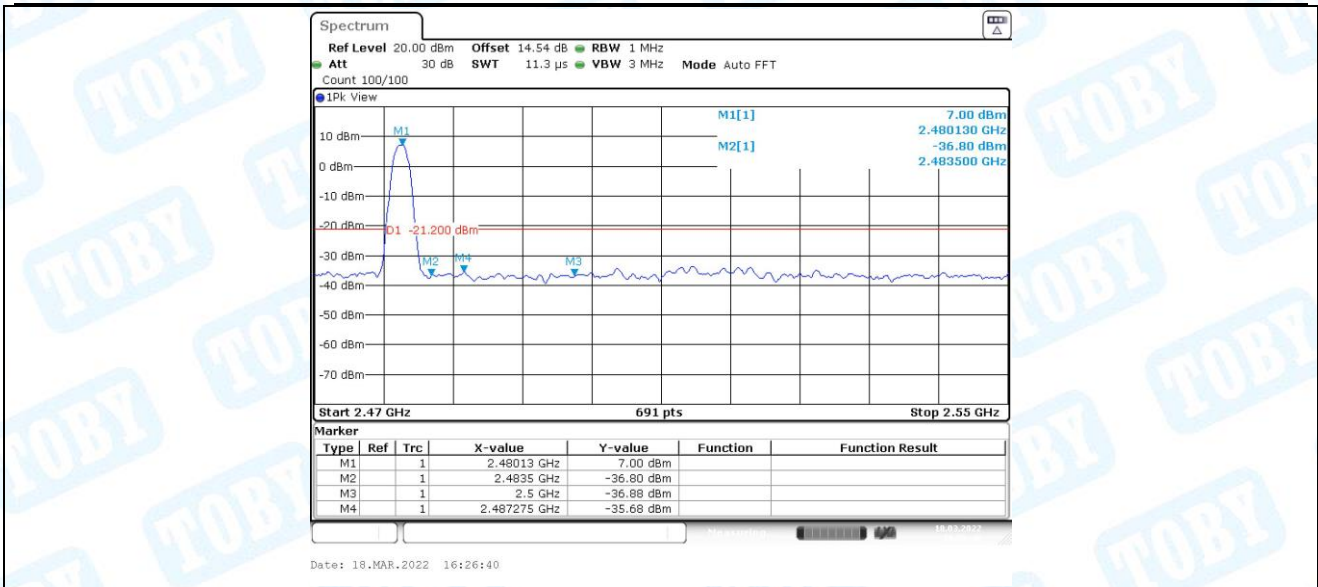
BLE_1M_Ant1_Low_2402_AV



BLE_1M_Ant1_Low_2402_Peak



BLE_1M_Ant1_High_2480_AV



BLE_1M_Ant1_High_2480_Peak

-----End of the report-----