RF Test Data for Bluetooth LE (Conducted Measurements)

General Description of EUT	
Product Name:	Flipper Zero
Test Model/HVIN:	FZ.1
Sample ID:	20210916-08-2#
Environmental Conditions	
Temperature:	23.5℃
Relative Humidity:	46%
Test Voltage:	DC 3.7V
Test Engineer:	JianPing Huang
Note: For a more detailed features description, please refer to the report TB-RF185806.	

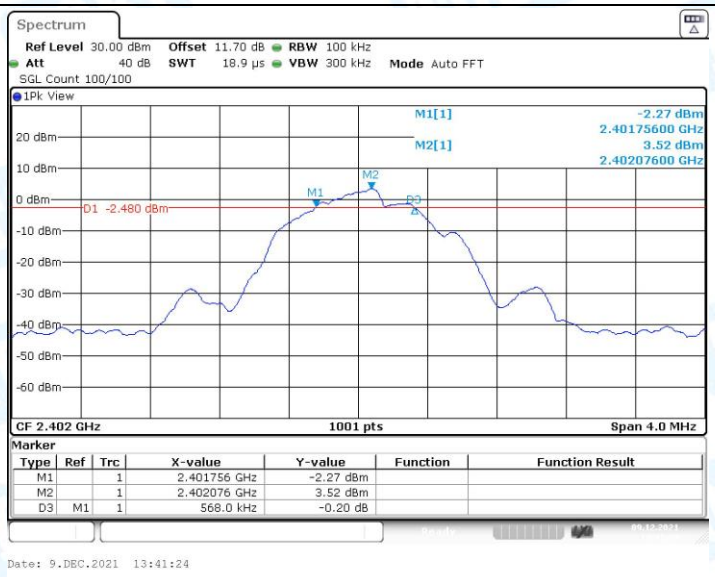
Contents

1. DTS Bandwidth

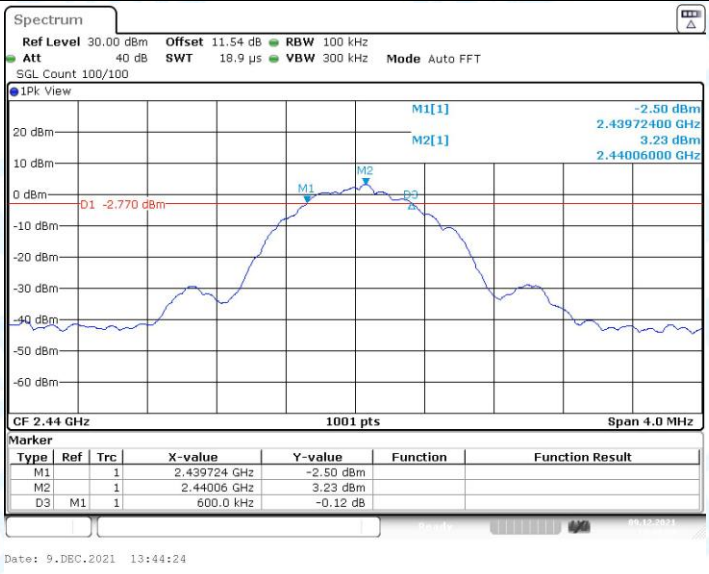
1.1.Test Result

Test Mode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.57	2401.76	2402.32	0.5	PASS
		2440	0.60	2439.72	2440.32	0.5	PASS
		2480	0.60	2479.72	2480.32	0.5	PASS
BLE_2M	Ant1	2402	0.52	2401.79	2402.31	0.5	PASS
		2440	0.60	2439.71	2440.31	0.5	PASS
		2480	0.61	2479.70	2480.32	0.5	PASS

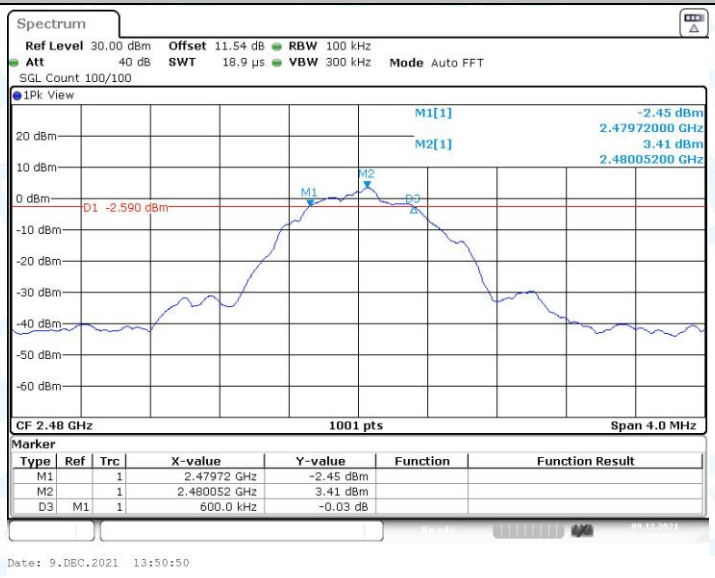
1.2.Test Graphs



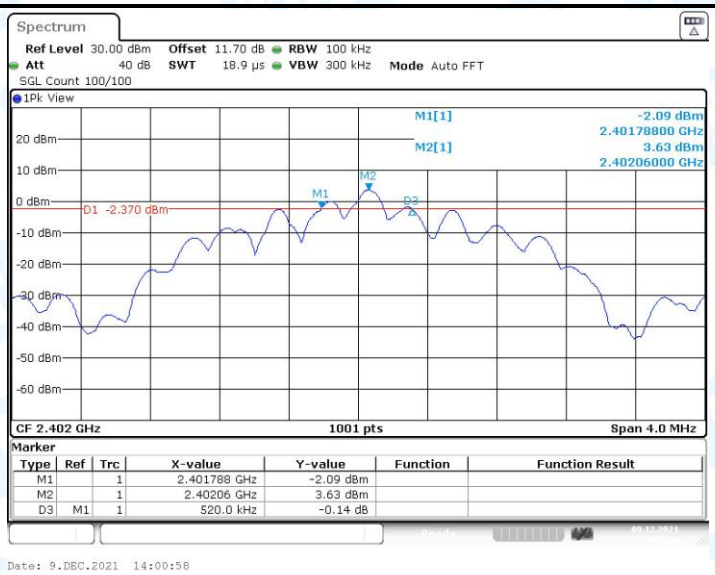
BLE_1M_Ant1_2402



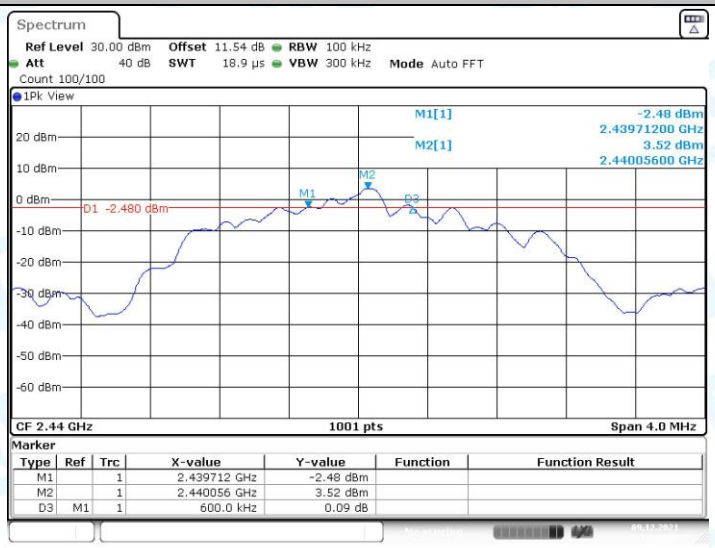
BLE_1M_Ant1_2440



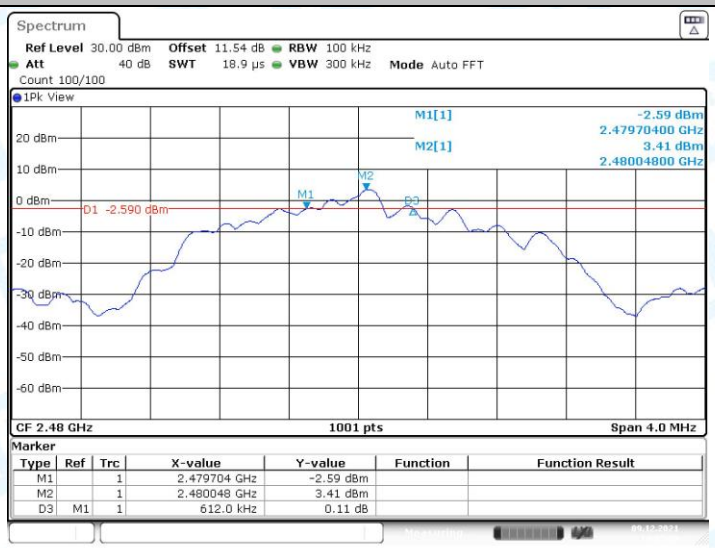
BLE_1M_Ant1_2480



BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



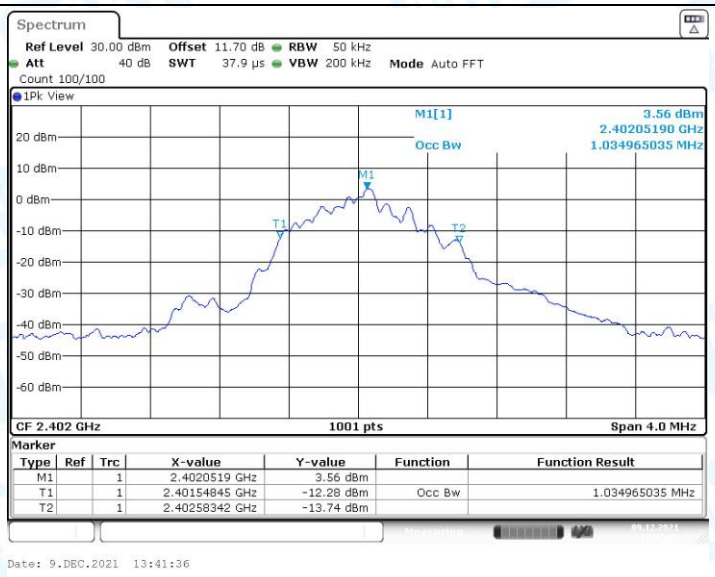
BLE_2M_Ant1_2480

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	1.035	2401.548	2402.583	---	PASS
		2440	1.031	2439.548	2440.579	---	PASS
		2480	1.027	2479.548	2480.575	---	PASS
BLE_2M	Ant1	2402	2.042	2401.049	2403.091	---	PASS
		2440	2.046	2439.049	2441.095	---	PASS
		2480	2.042	2479.049	2481.091	---	PASS

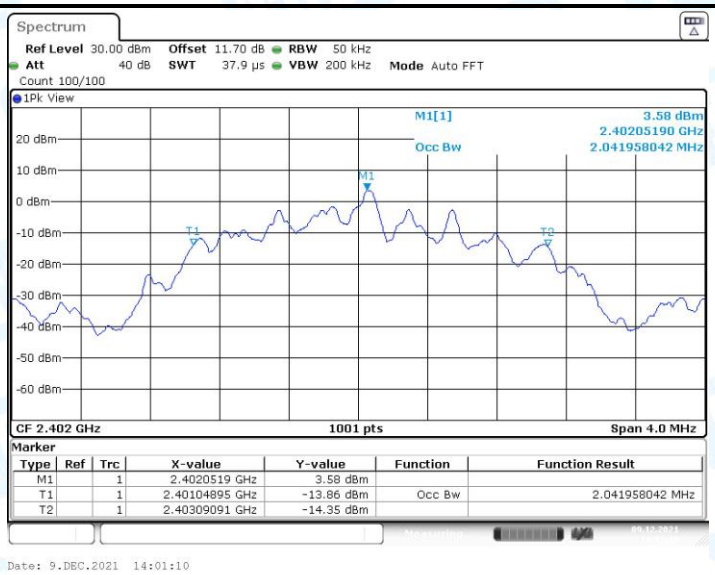
2.2.Test Graphs



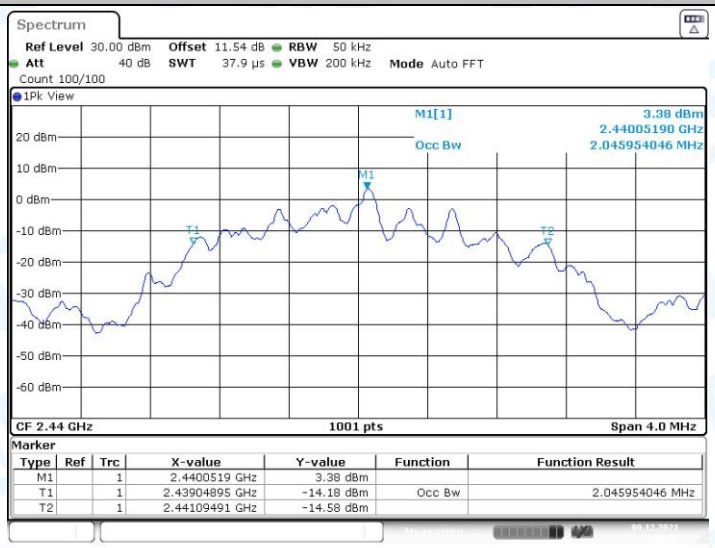
BLE_1M_Ant1_2402

BLE_1M_Ant1_2440

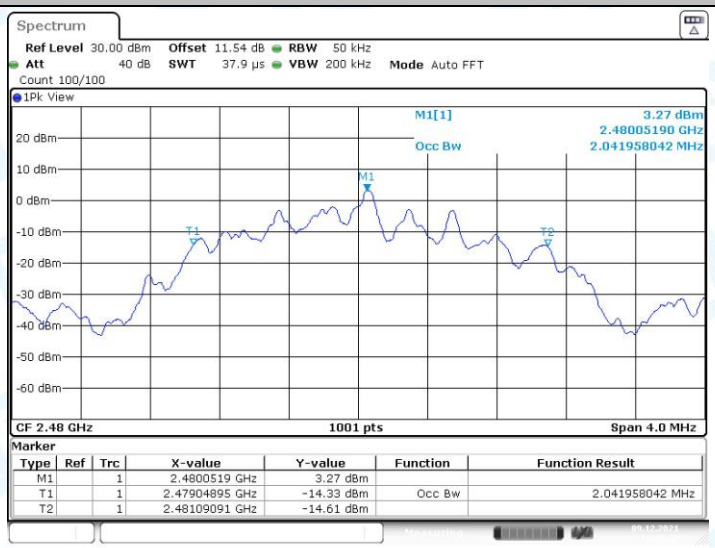
BLE_1M_Ant1_2480



BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



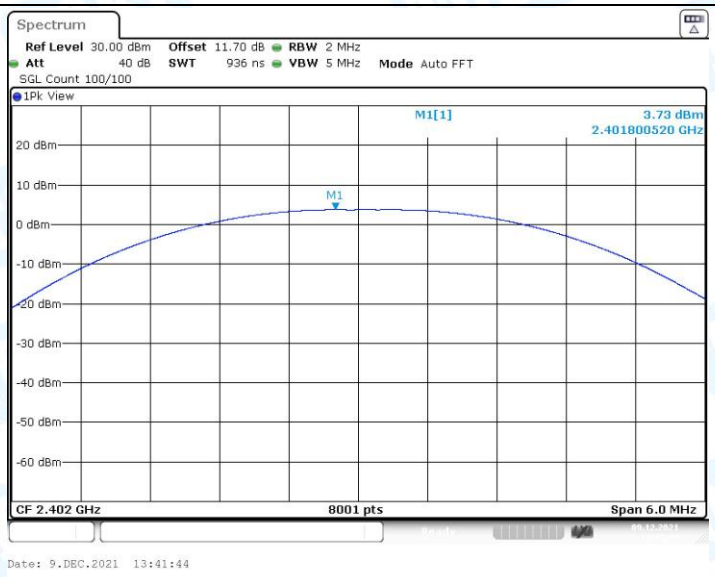
BLE_2M_Ant1_2480

3. Maximum conducted output power

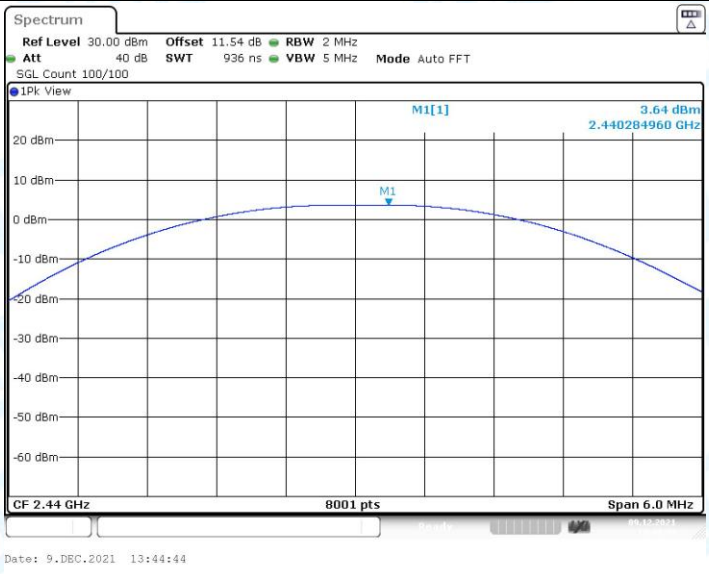
3.1.Test Result

Test Mode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	3.73	≤30	PASS
		2440	3.64	≤30	PASS
		2480	3.54	≤30	PASS
BLE_2M	Ant1	2402	3.74	≤30	PASS
		2440	3.65	≤30	PASS
		2480	3.42	≤30	PASS

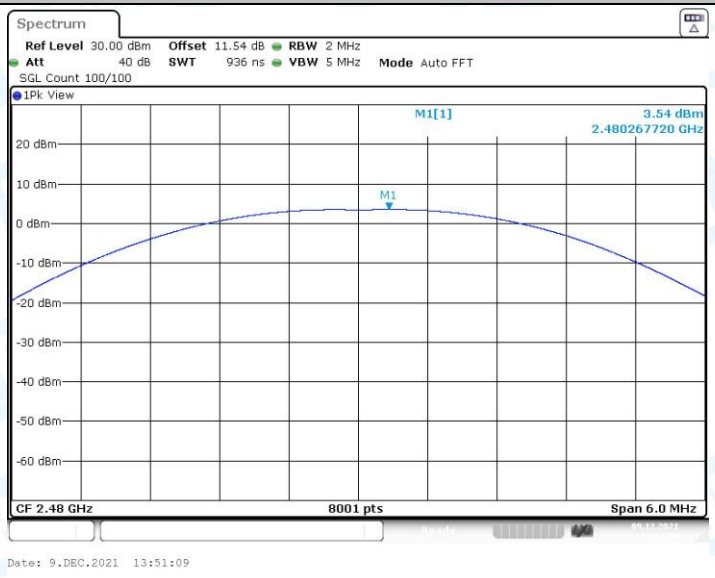
3.2.Test Graphs



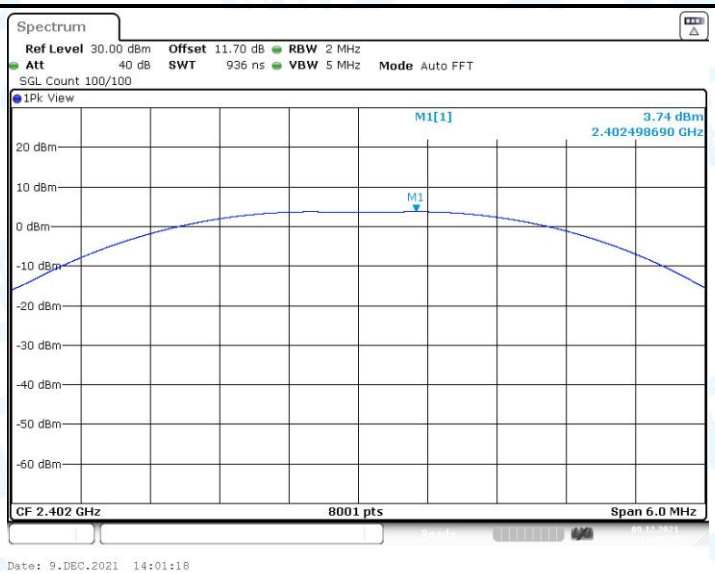
BLE_1M_Ant1_2402



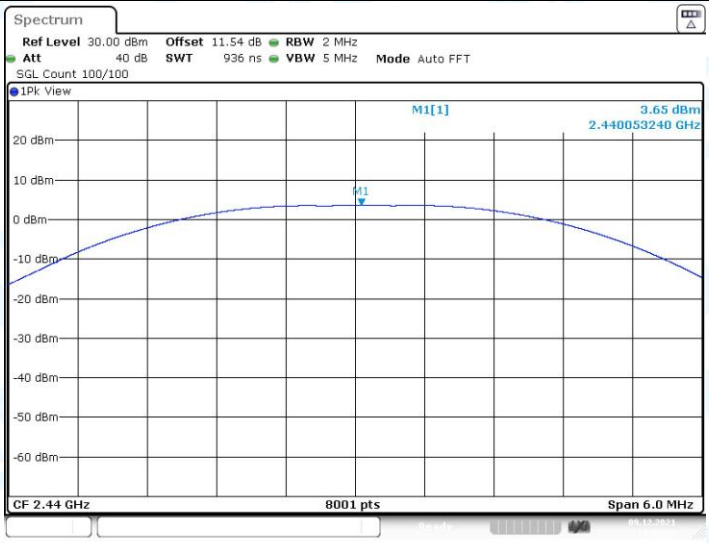
BLE_1M_Ant1_2440



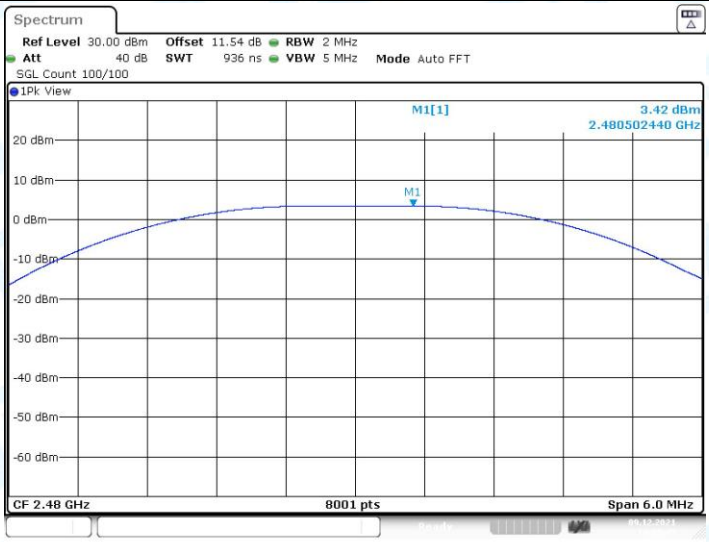
BLE_1M_Ant1_2480



BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



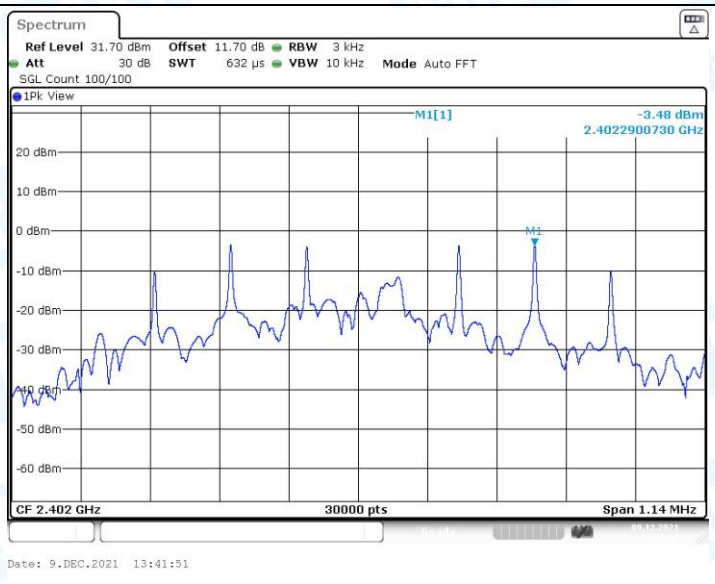
BLE_2M_Ant1_2480

4. Maximum power spectral density

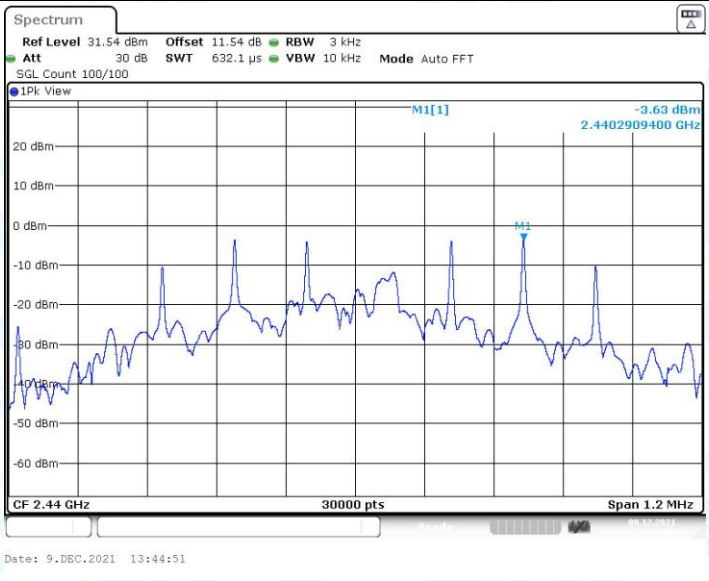
4.1.Test Result

Test Mode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-3.48	≤8	PASS
		2440	-3.63	≤8	PASS
		2480	-3.74	≤8	PASS
BLE_2M	Ant1	2402	-6.89	≤8	PASS
		2440	-6.88	≤8	PASS
		2480	-7	≤8	PASS

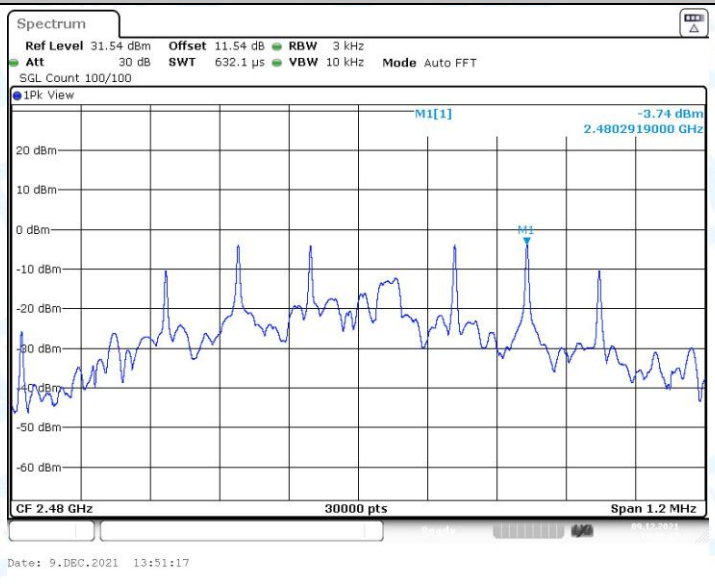
4.2.Test Graphs



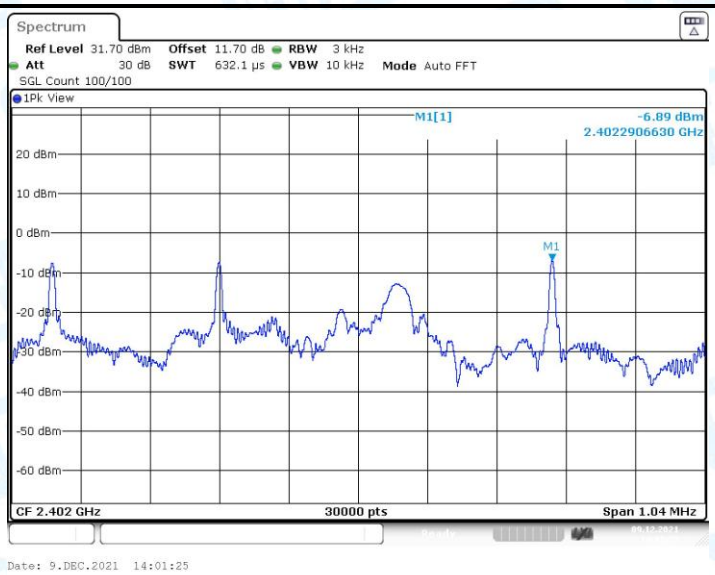
BLE_1M_Ant1_2402



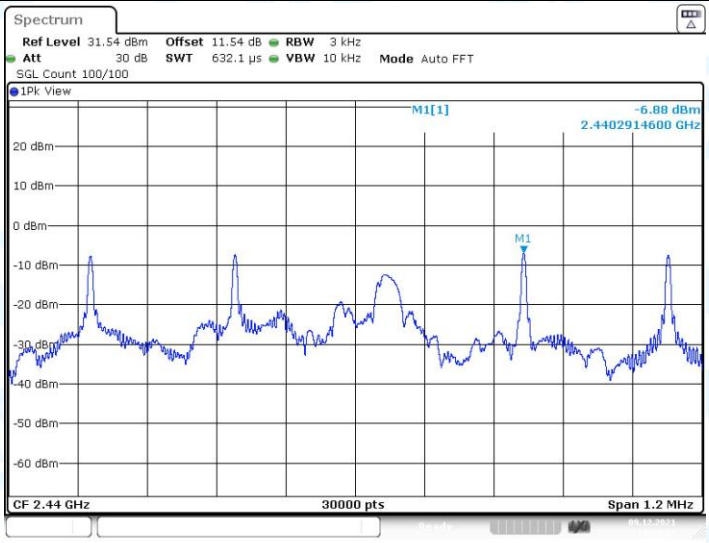
BLE_1M_Ant1_2440



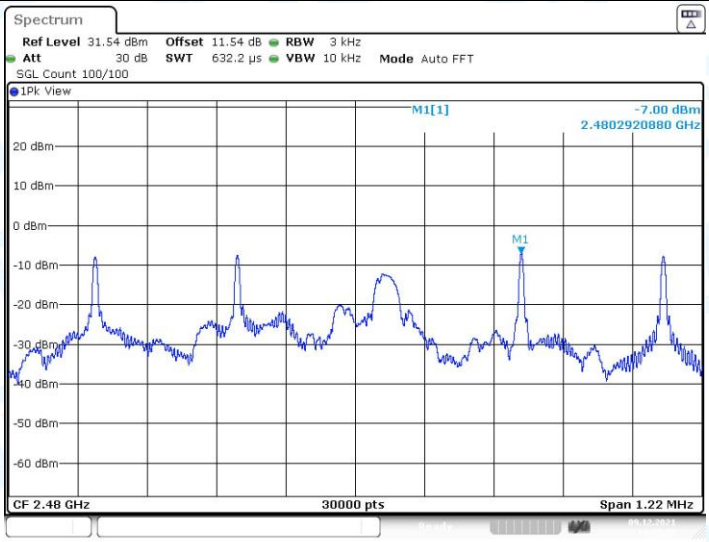
BLE_1M_Ant1_2480



BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



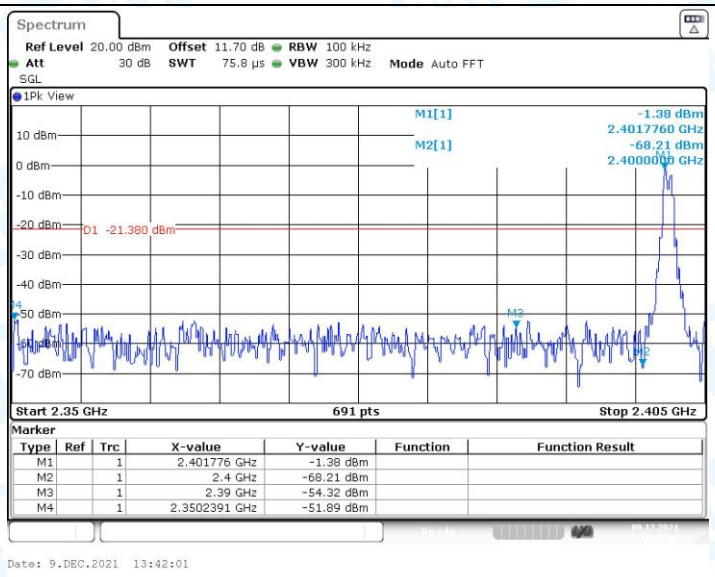
BLE_2M_Ant1_2480

5. Band edge measurements

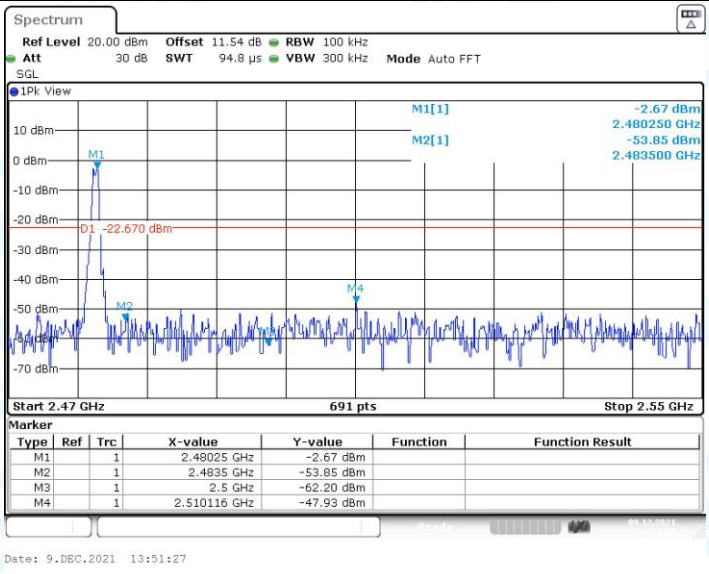
5.1.Test Result

Test Mode	Antenna	ChName	Channel	Ref.Level[dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	Low	2402	-1.38	-51.89	≤-21.38	PASS
		High	2480	-2.67	-47.93	≤-22.67	PASS
BLE_2M	Ant1	Low	2402	-2.52	-43.35	≤-22.52	PASS
		High	2480	-2.71	-49.11	≤-22.71	PASS

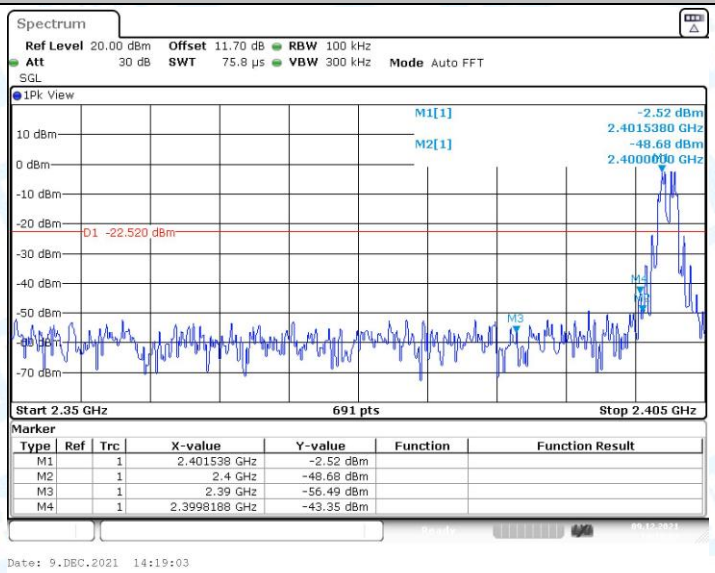
5.2.Test Graphs



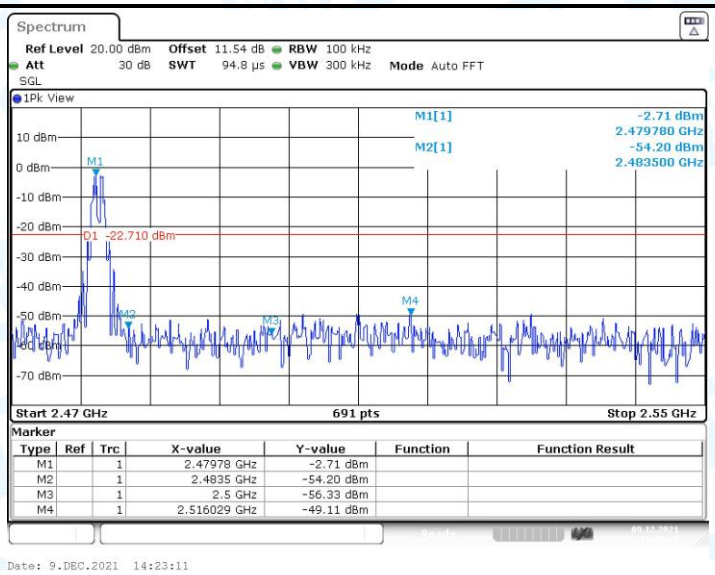
BLE_1M_Ant1_Low_2402



BLE_1M_Ant1_High_2480



BLE_2M_Ant1_Low_2402



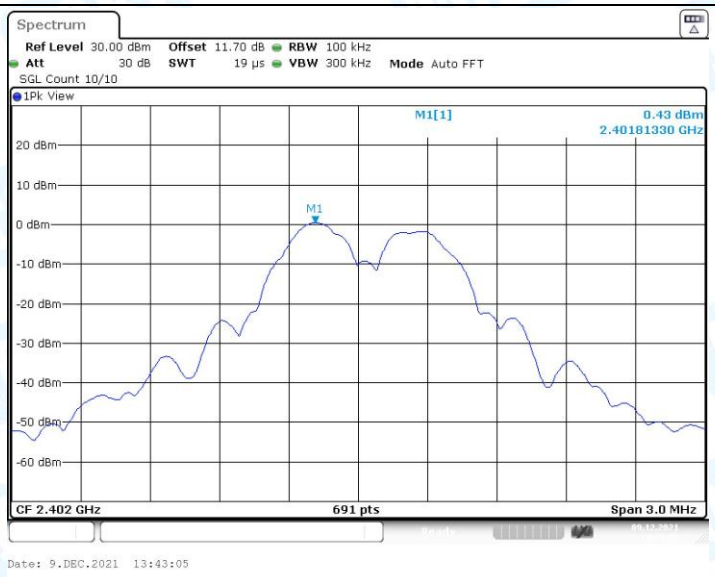
BLE_2M_Ant1_High_2480

6. Conducted Spurious Emission

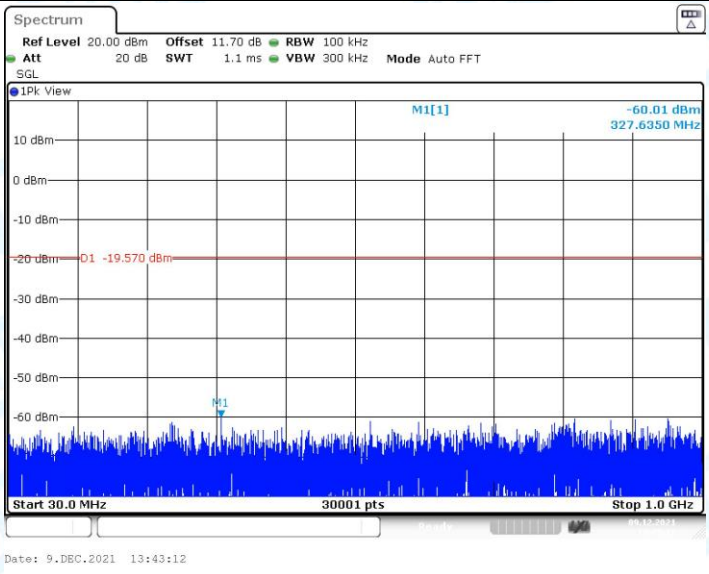
6.1.Test Result

Test Mode	Antenna	Channel	Freq. Range [MHz]	Ref. Level [dBm]	Result[dBm]	Limit[dBm]	Verdict
BLE_1M	Ant1	2402	Reference	0.43	0.43	---	PASS
			30~1000	0.43	-60.01	≤-19.57	PASS
			1000~26500	0.43	-50.05	≤-19.57	PASS
		2440	Reference	3.51	3.51	---	PASS
			30~1000	3.51	-58.89	≤-16.49	PASS
			1000~26500	3.51	-50.25	≤-16.49	PASS
		2480	Reference	2.73	2.73	---	PASS
			30~1000	2.73	-60.8	≤-17.27	PASS
			1000~26500	2.73	-49.35	≤-17.27	PASS
BLE_2M	Ant1	2402	Reference	2.86	2.86	---	PASS
			30~1000	2.86	-60.55	≤-17.14	PASS
			1000~26500	2.86	-49.84	≤-17.14	PASS
		2440	Reference	-2.59	-2.59	---	PASS
			30~1000	-2.59	-59.58	≤-22.59	PASS
			1000~26500	-2.59	-49.12	≤-22.59	PASS
		2480	Reference	-2.85	-2.85	---	PASS
			30~1000	-2.85	-60.56	≤-22.85	PASS
			1000~26500	-2.85	-50.99	≤-22.85	PASS

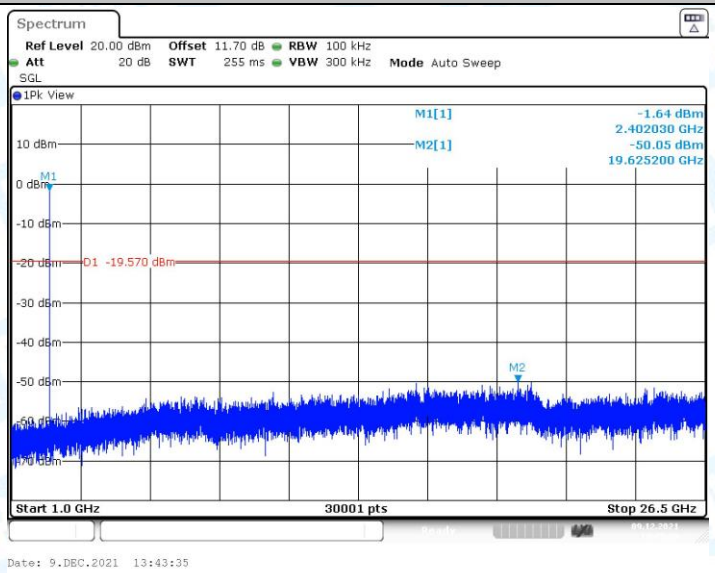
6.2.Test Graphs



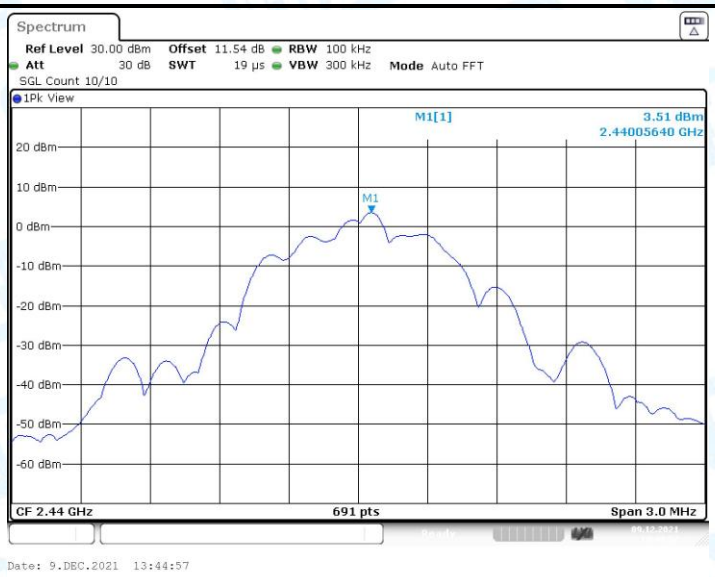
BLE_1M_Ant1_2402_0~Reference



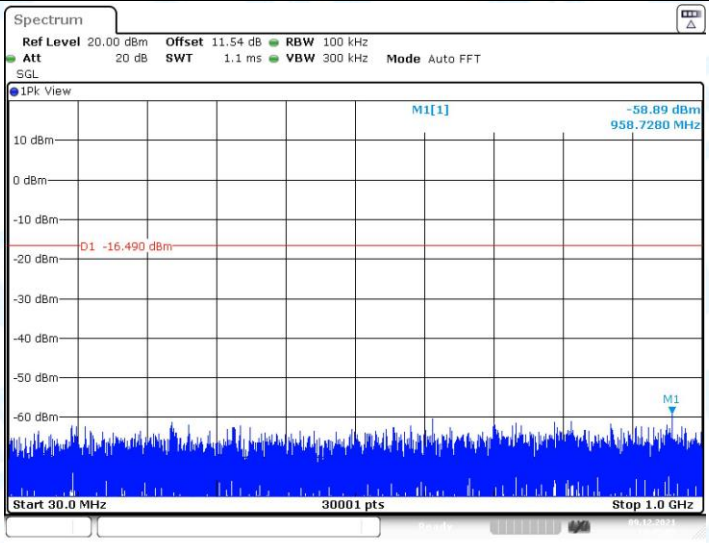
BLE_1M_Ant1_2402_30~1000



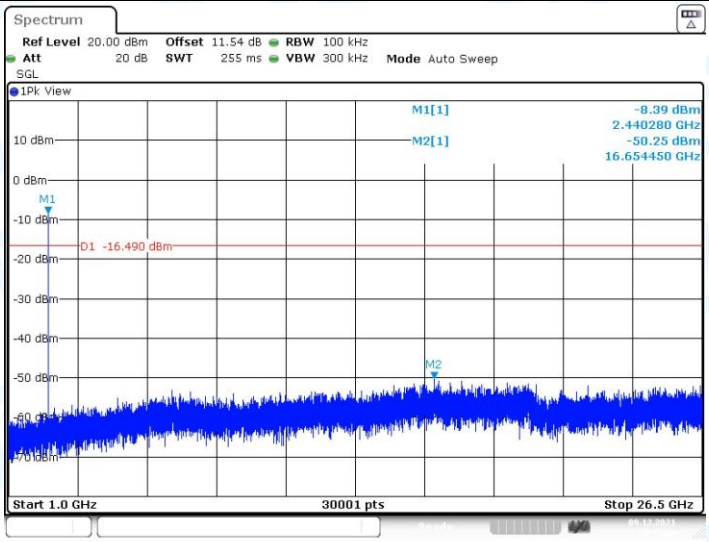
BLE_1M_Ant1_2402_1000~26500



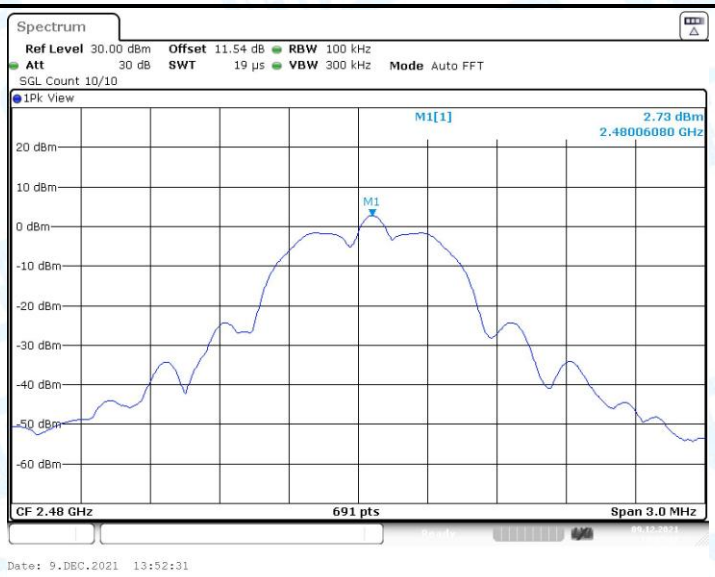
BLE_1M_Ant1_2440_0~Reference



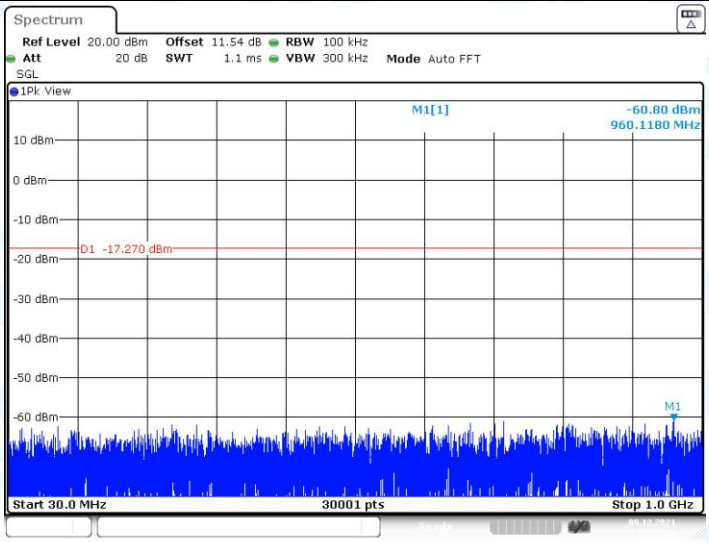
BLE_1M_Ant1_2440_30~1000



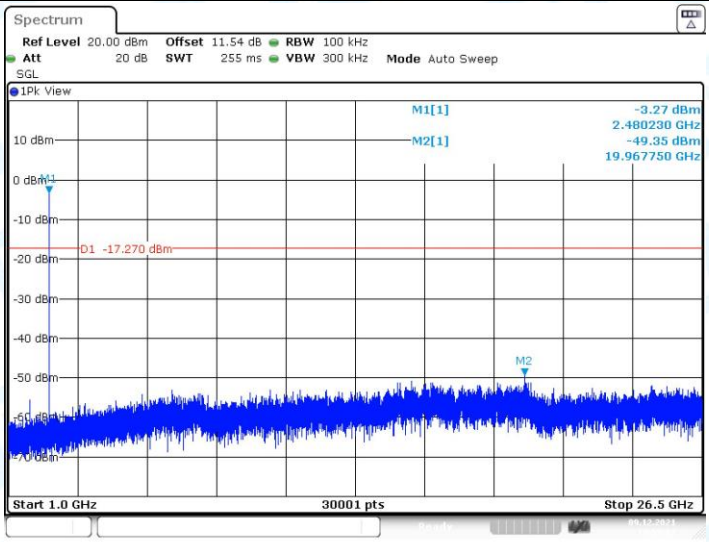
BLE_1M_Ant1_2440_1000~26500



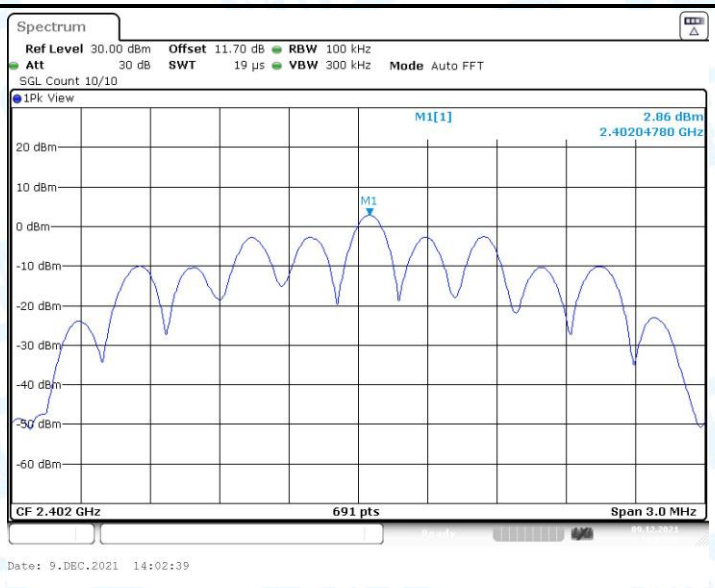
BLE_1M_Ant1_2480_0~Reference



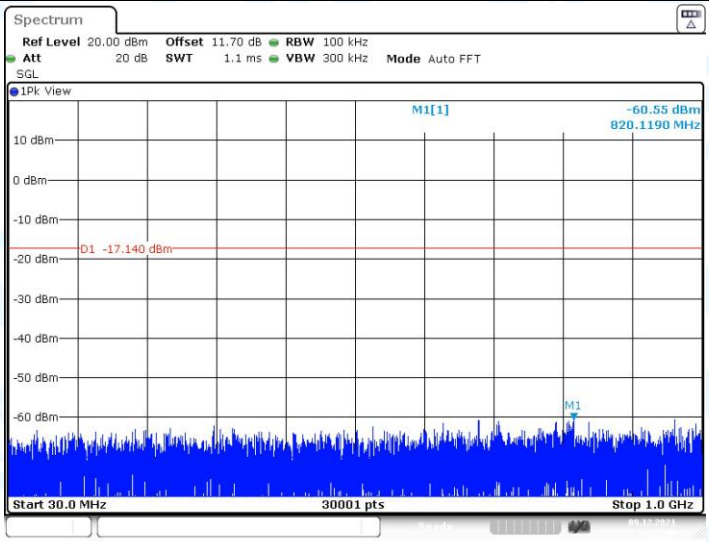
BLE_1M_Ant1_2480_30~1000



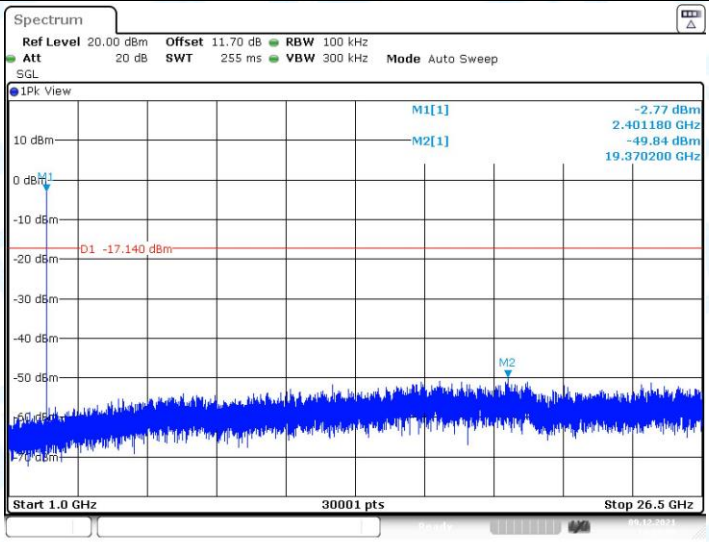
BLE_1M_Ant1_2480_1000~26500



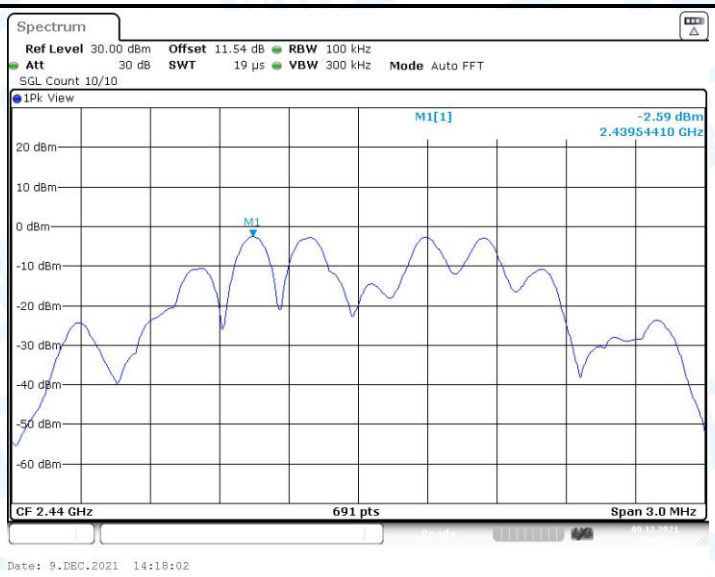
BLE_2M_Ant1_2402_0~Reference



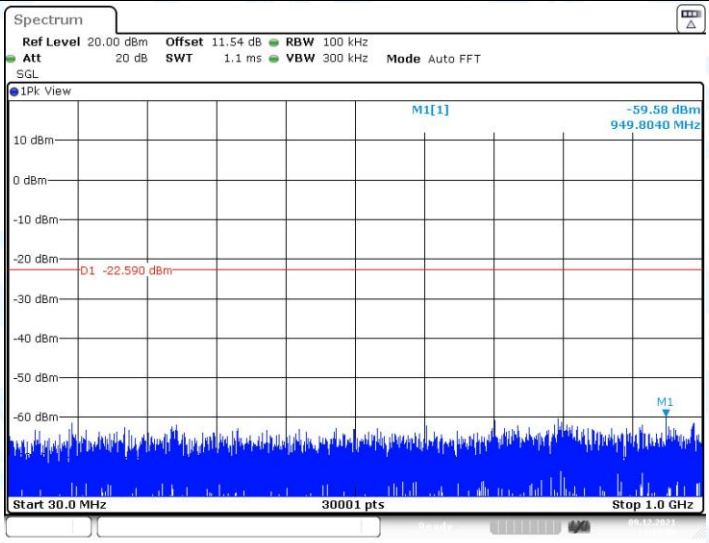
BLE_2M_Ant1_2402_30~1000



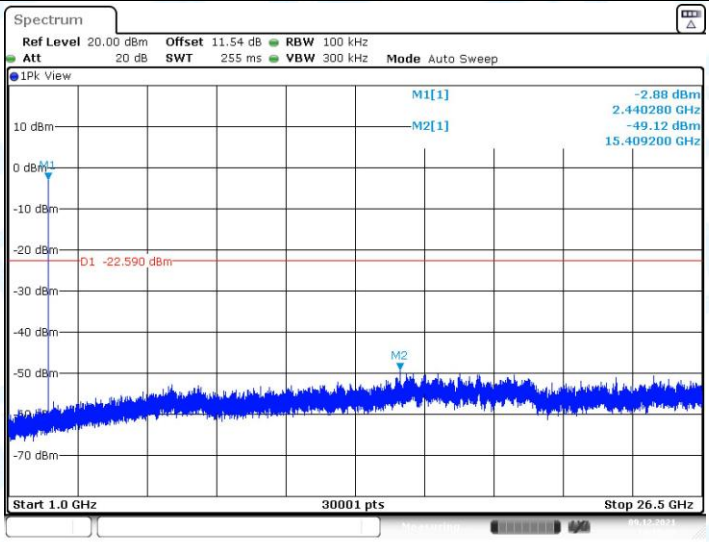
BLE_2M_Ant1_2402_1000~26500



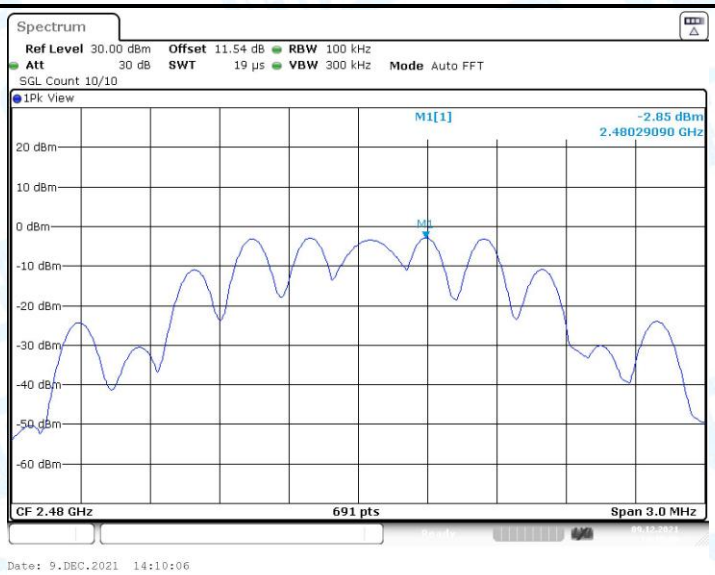
BLE_2M_Ant1_2440_0~Reference



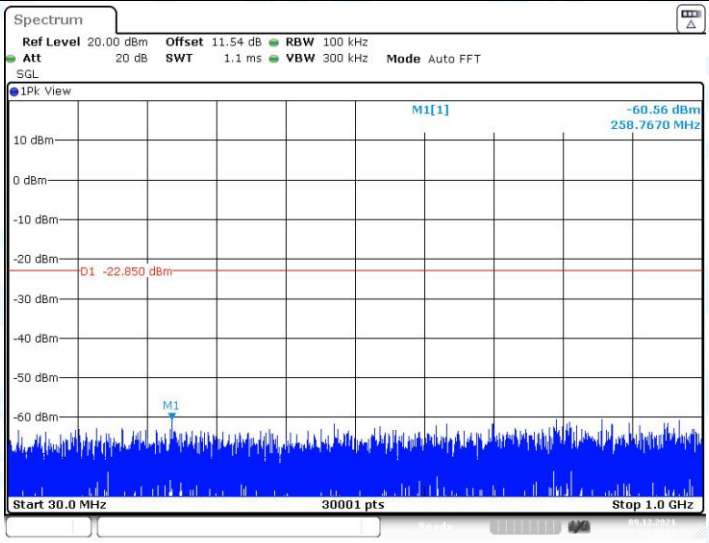
BLE_2M_Ant1_2440_30~1000



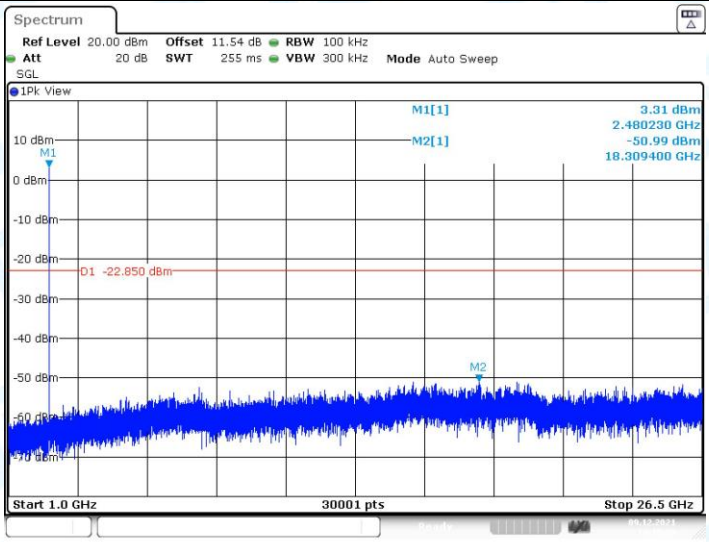
BLE_2M_Ant1_2440_1000~26500



BLE_2M_Ant1_2480_0~Reference



BLE_2M_Ant1_2480_30~1000



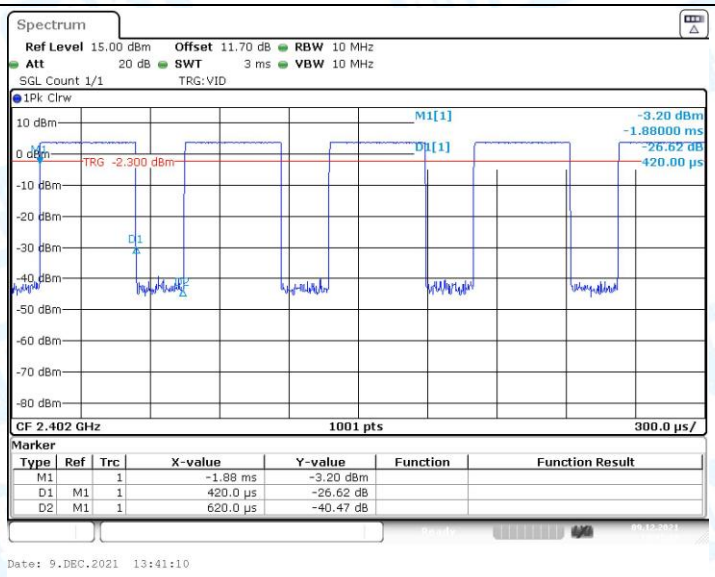
BLE_2M_Ant1_2480_1000~26500

7. Duty Cycle

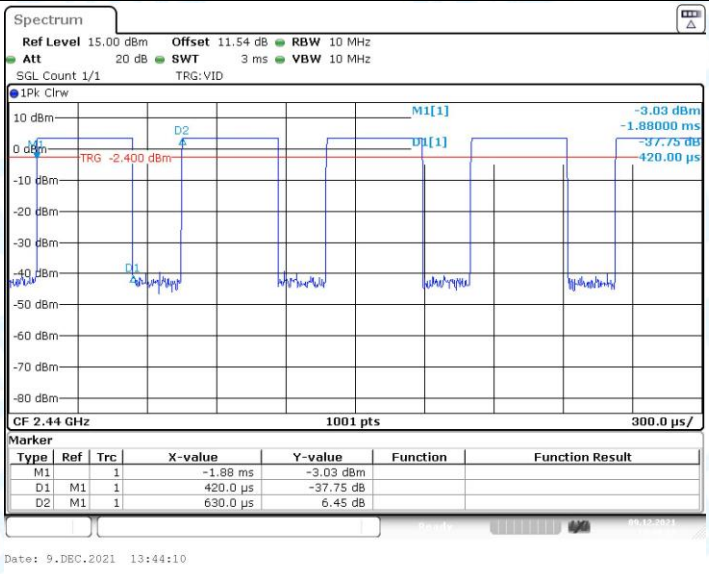
7.1.Test Result

Test Mode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	1/T [KHz]	Limit	Verdict
BLE_1M	Ant1	2402	0.42	0.62	67.74	2.38	---	PASS
		2440	0.42	0.63	66.67	2.38	---	PASS
		2480	0.42	0.63	66.67	2.38	---	PASS
BLE_2M	Ant1	2402	0.23	0.63	36.51	4.35	---	PASS
		2440	0.24	0.63	38.10	4.17	---	PASS
		2480	0.23	0.63	36.51	4.35	---	PASS
Note: 1/T=1/Transmission Duration.								

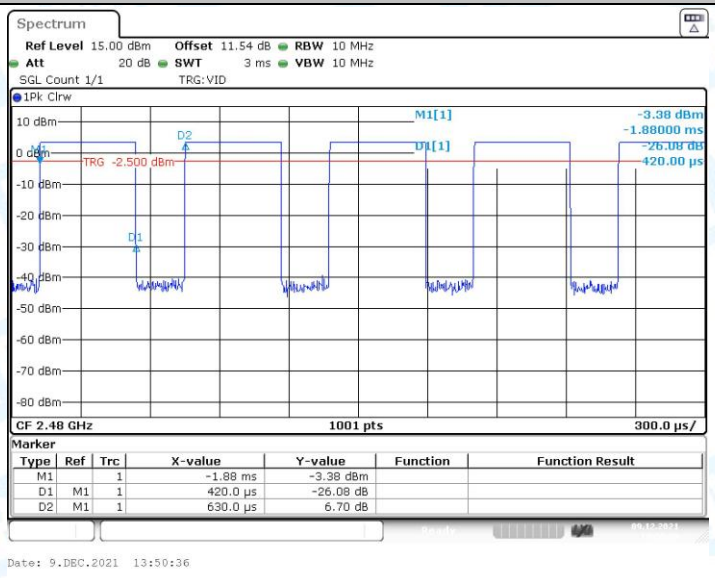
7.2.Test Graphs



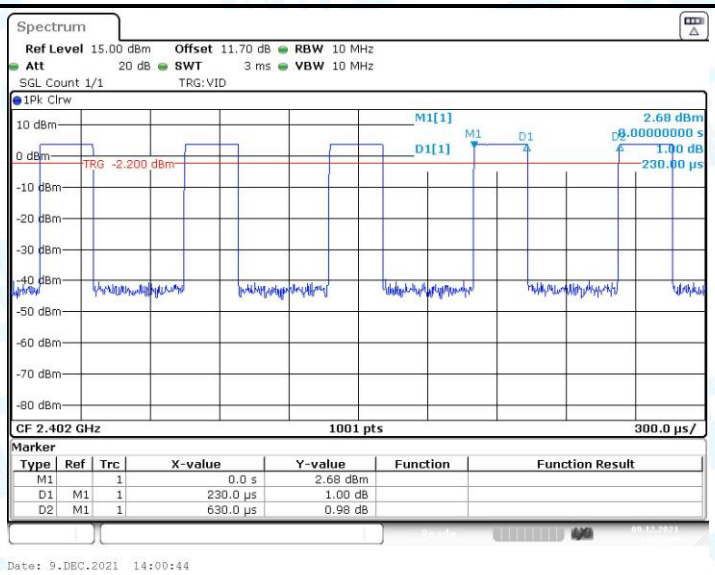
BLE_1M_Ant1_2402



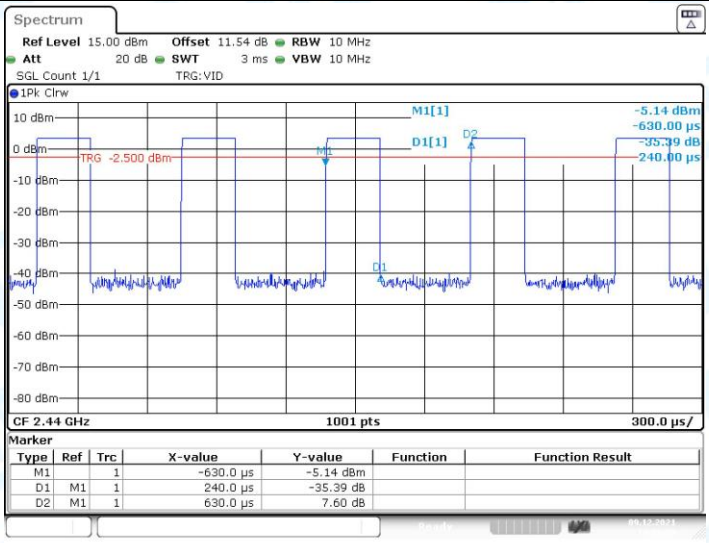
BLE_1M_Ant1_2440



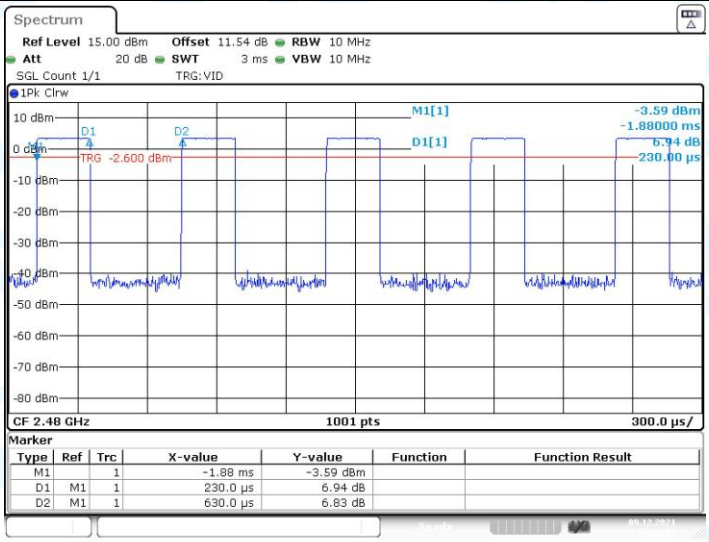
BLE_1M_Ant1_2480



BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



BLE_2M_Ant1_2480

8. Emissions in Restricted Bands

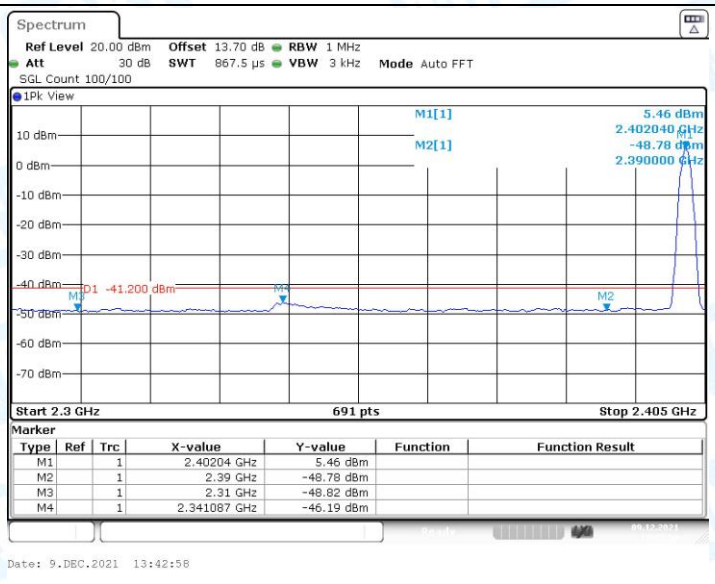
8.1.Test Result

Test Mode	Antenna	ChName	Channel	Detector	Freq. [MHz]	Result [dBm]	Limit [dBm]	Verdict
BLE_1M	Ant1	Low	2402	AV	2310.000	-48.82	≤-41.20	PASS
				AV	2341.087	-46.19	≤-41.20	PASS
				AV	2390.000	-48.78	≤-41.20	PASS
				Peak	2310.000	-41.35	≤-21.20	PASS
				Peak	2351.130	-36.62	≤-21.20	PASS
				Peak	2390.000	-39.5	≤-21.20	PASS
		High	2480	AV	2483.500	-47.94	≤-41.20	PASS
				AV	2483.913	-47.56	≤-41.20	PASS
				AV	2500.000	-48.22	≤-41.20	PASS
				Peak	2483.500	-40.84	≤-21.20	PASS
				Peak	2486.116	-38.49	≤-21.20	PASS
				Peak	2500.000	-40.41	≤-21.20	PASS
BLE_2M	Ant1	Low	2402	AV	2310.000	-48.52	≤-41.20	PASS
				AV	2340.022	-45.56	≤-41.20	PASS
				AV	2390.000	-48.61	≤-41.20	PASS
				Peak	2310.000	-39.17	≤-21.20	PASS
				Peak	2344.739	-36.93	≤-21.20	PASS
				Peak	2390.000	-41.25	≤-21.20	PASS
		High	2480	AV	2483.500	-47.34	≤-41.20	PASS
				AV	2488.087	-47.18	≤-41.20	PASS
				AV	2500.000	-47.41	≤-41.20	PASS
				Peak	2483.500	-39.05	≤-21.20	PASS
				Peak	2490.522	-37.9	≤-21.20	PASS
				Peak	2500.000	-39.57	≤-21.20	PASS

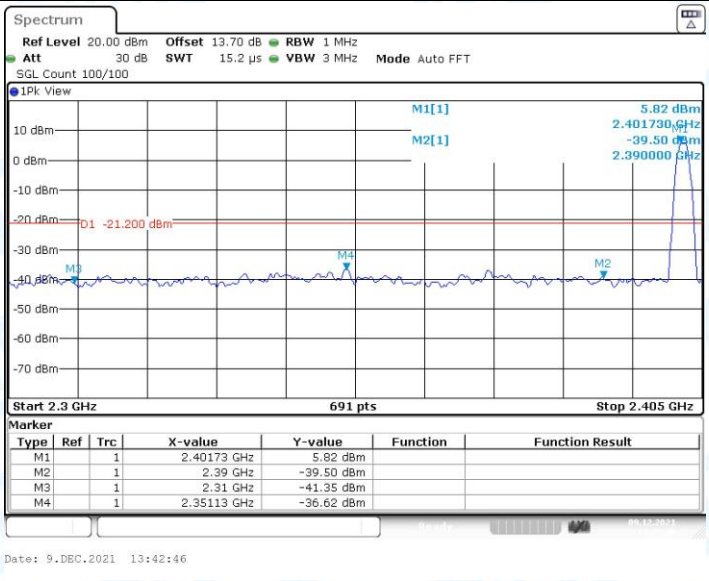
Note：

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.

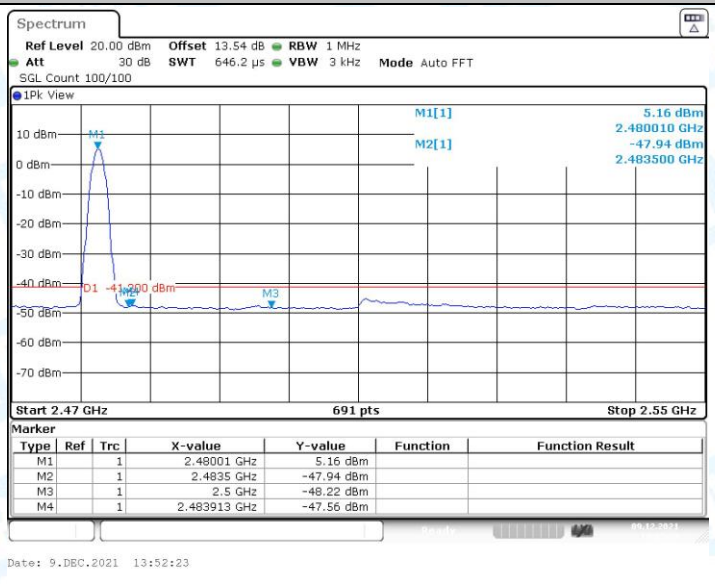
8.2.Test Graphs



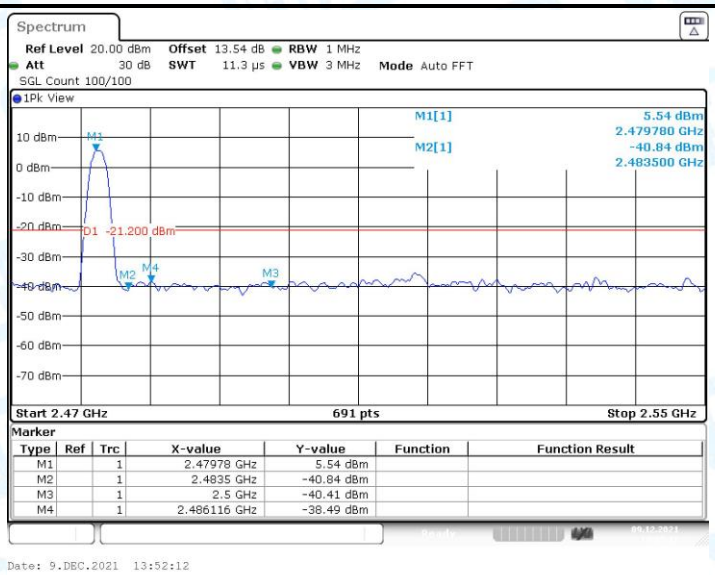
BLE_1M_Ant1_Low_2402_AV



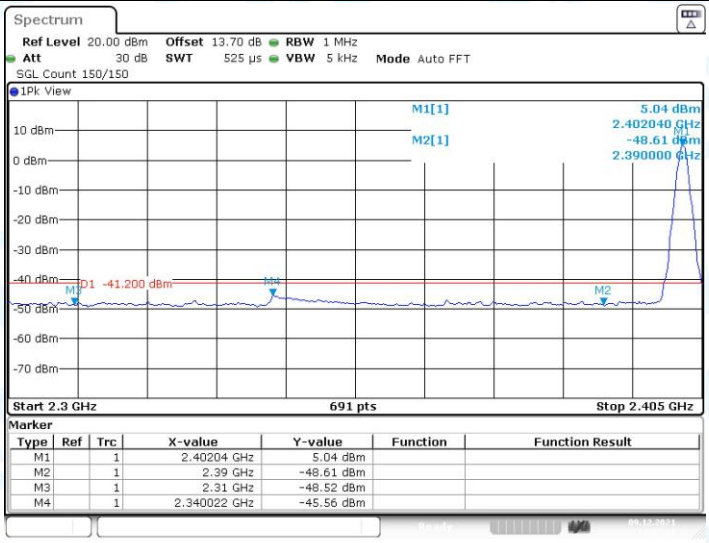
BLE_1M_Ant1_Low_2402_Peak



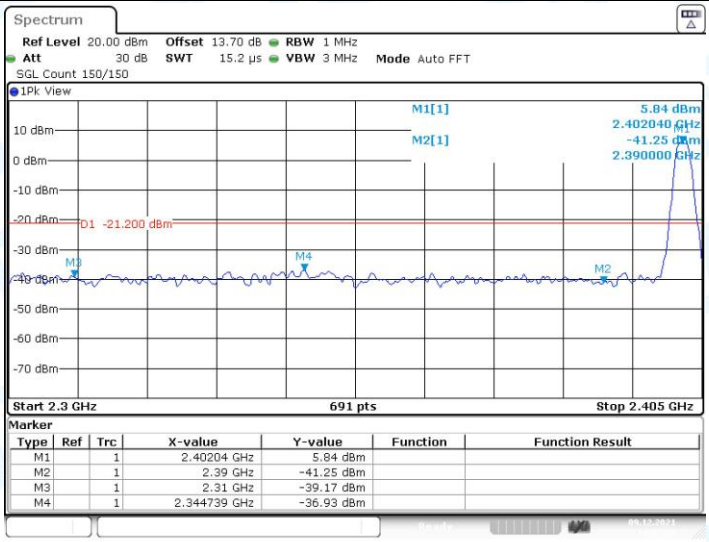
BLE_1M_Ant1_High_2480_AV



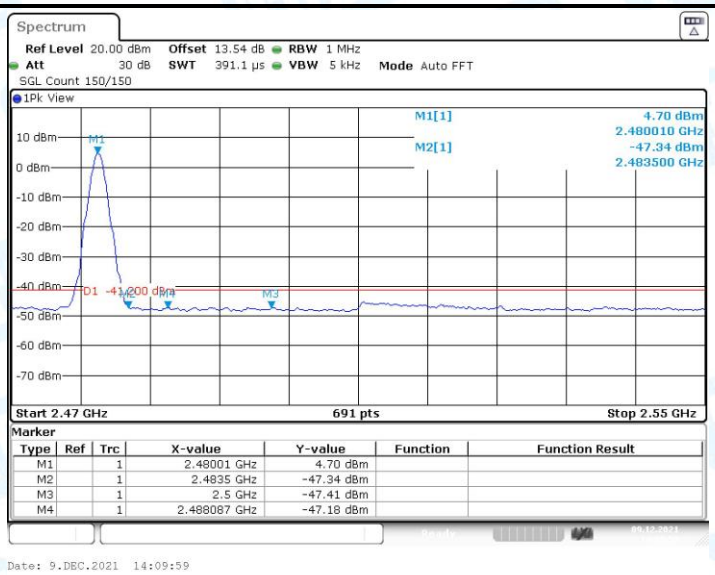
BLE_1M_Ant1_High_2480_Peak



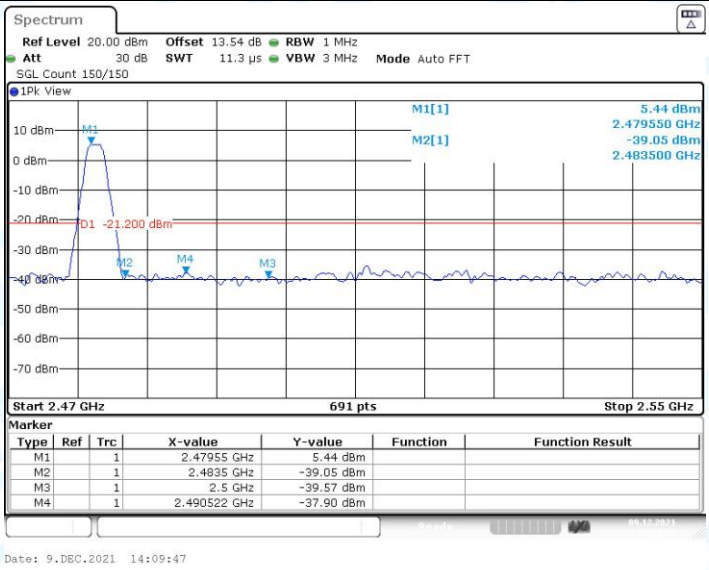
BLE_2M_Ant1_Low_2402_AV



BLE_2M_Ant1_Low_2402_Peak



BLE_2M_Ant1_High_2480_AV



BLE_2M_Ant1_High_2480_Peak

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