

RF Test Data for Bluetooth LE (Conducted Measurements)

| General Description of EUT | |
|--|---|
| Product Name: | Universal Cold-shoe Wireless Controller |
| Test Model: | 3906 |
| Sample ID: | 202204-0384-2-2# |
| Environmental Conditions | |
| Temperature: | 24°C |
| Relative Humidity: | 50% |
| Test Voltage: | DC 3V |
| Test Engineer: | Huangjianping |
| Note: For a more detailed features description, please refer to the report TBR-C-202204-0384-13. | |

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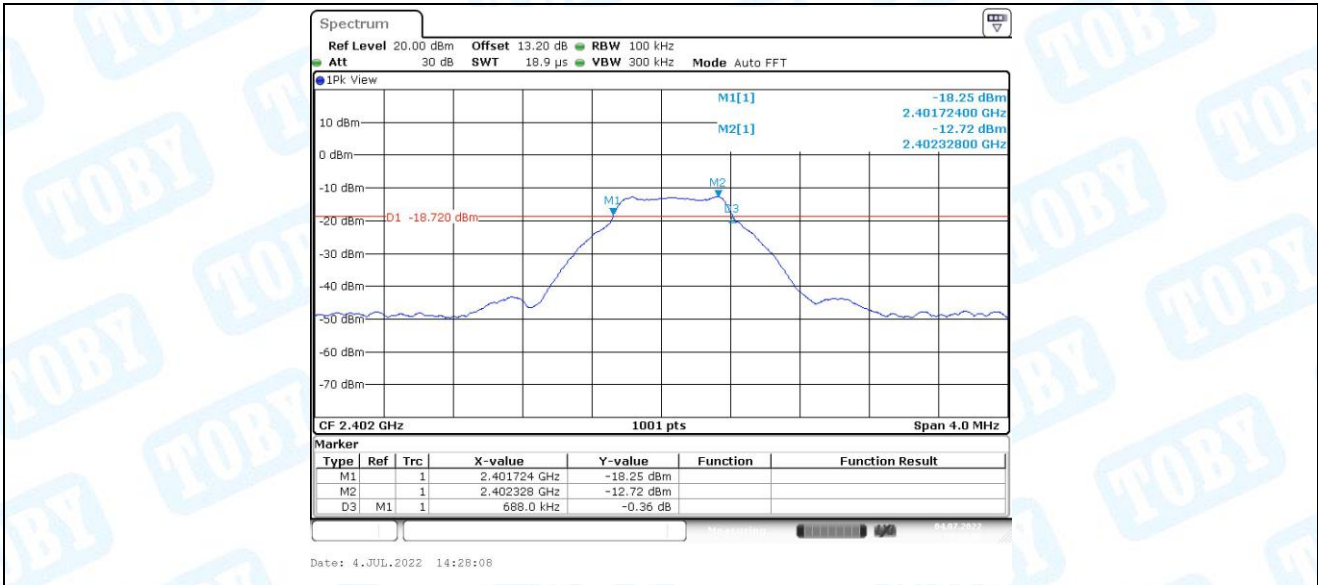
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1. DTS Bandwidth

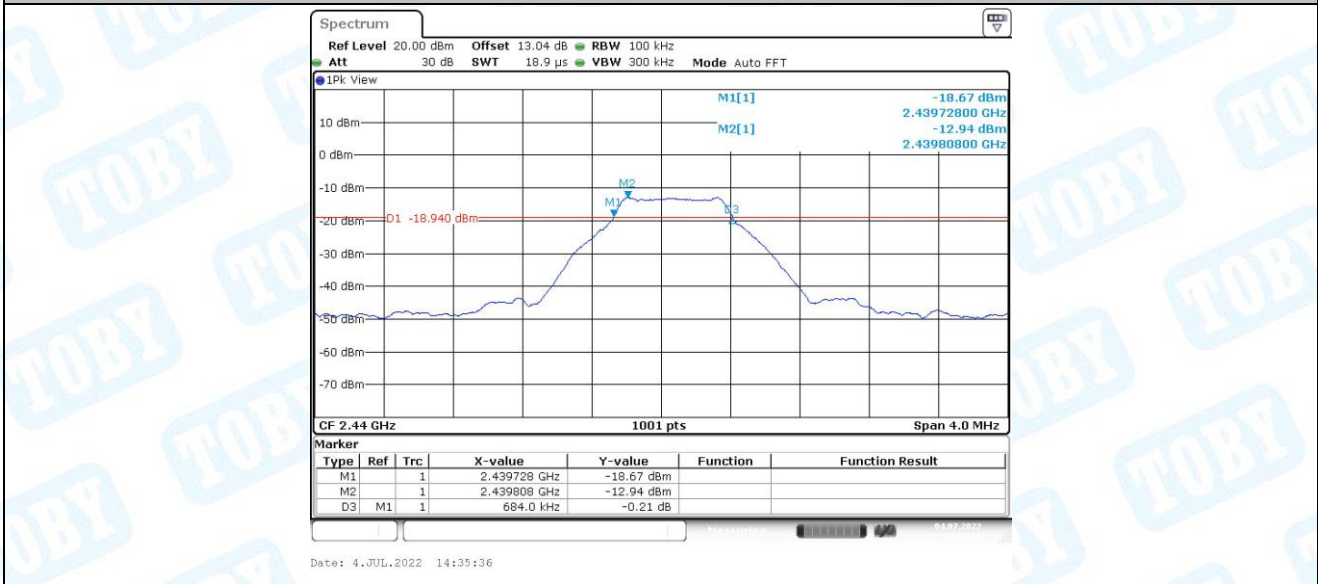
1.1. Test Result

| Test Mode | Antenna | Channel | DTS BW [MHz] | FL[MHz] | FH[MHz] | Limit[MHz] | Verdict |
|-----------|---------|---------|--------------|---------|---------|------------|---------|
| BLE_1M | Ant1 | 2402 | 0.69 | 2401.72 | 2402.41 | 0.5 | PASS |
| | | 2440 | 0.68 | 2439.73 | 2440.41 | 0.5 | PASS |
| | | 2480 | 0.68 | 2479.72 | 2480.41 | 0.5 | PASS |
| BLE_2M | Ant1 | 2402 | 1.17 | 2401.48 | 2402.65 | 0.5 | PASS |
| | | 2440 | 1.18 | 2439.48 | 2440.66 | 0.5 | PASS |
| | | 2480 | 1.18 | 2479.48 | 2480.67 | 0.5 | PASS |

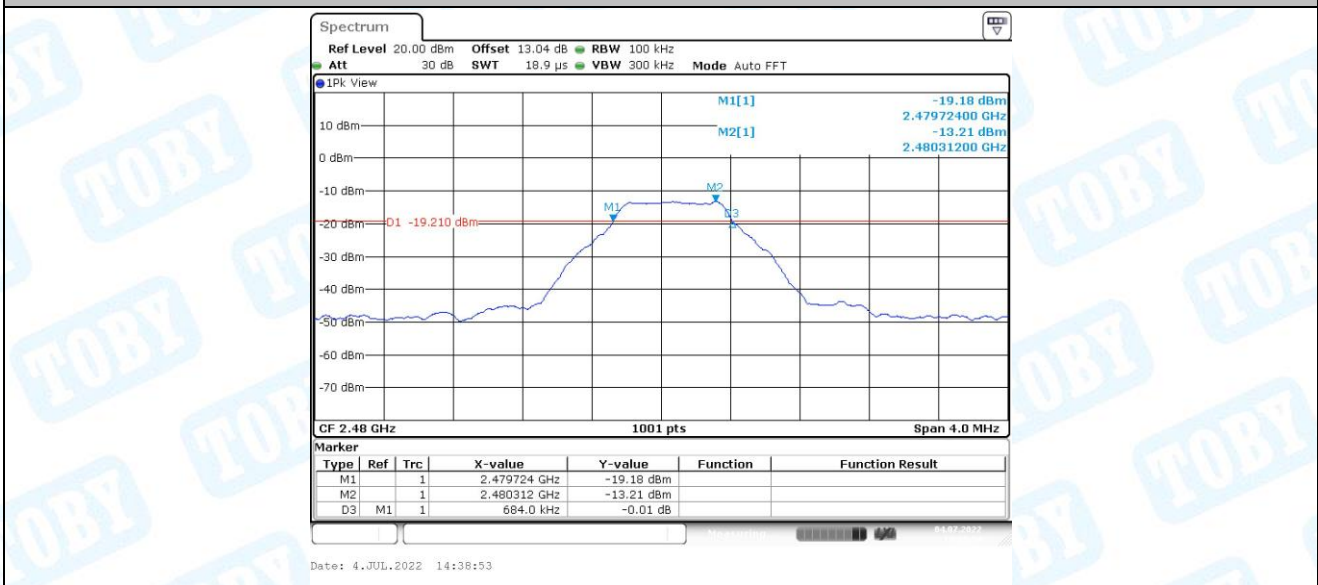
1.2. Test Graphs



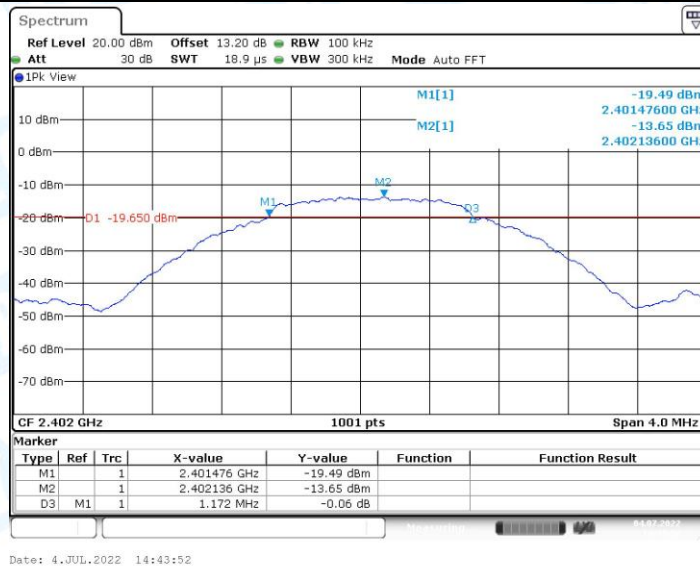
BLE_1M_Ant1_2402



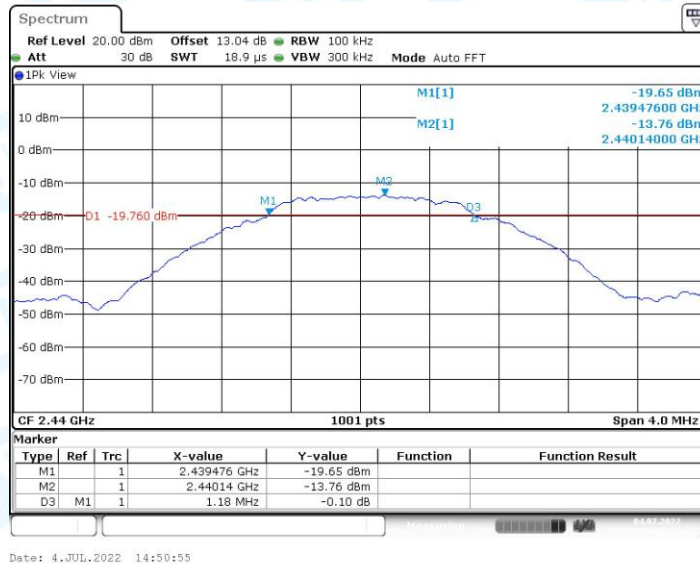
BLE_1M_Ant1_2440



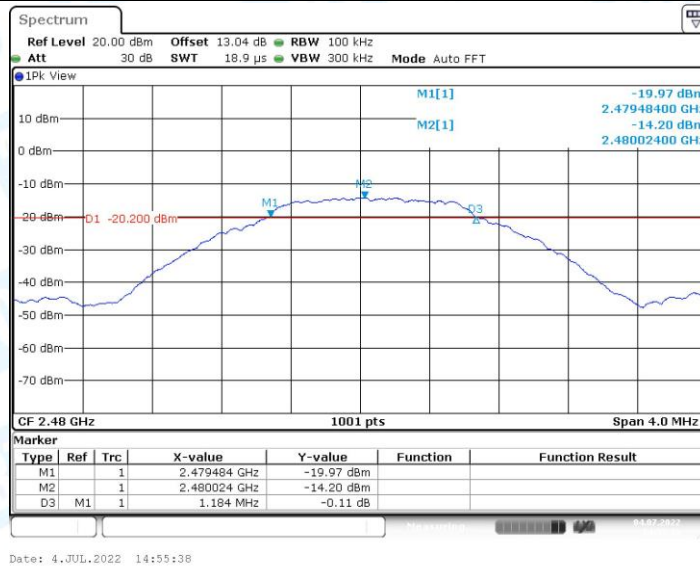
BLE_1M_Ant1_2480



BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



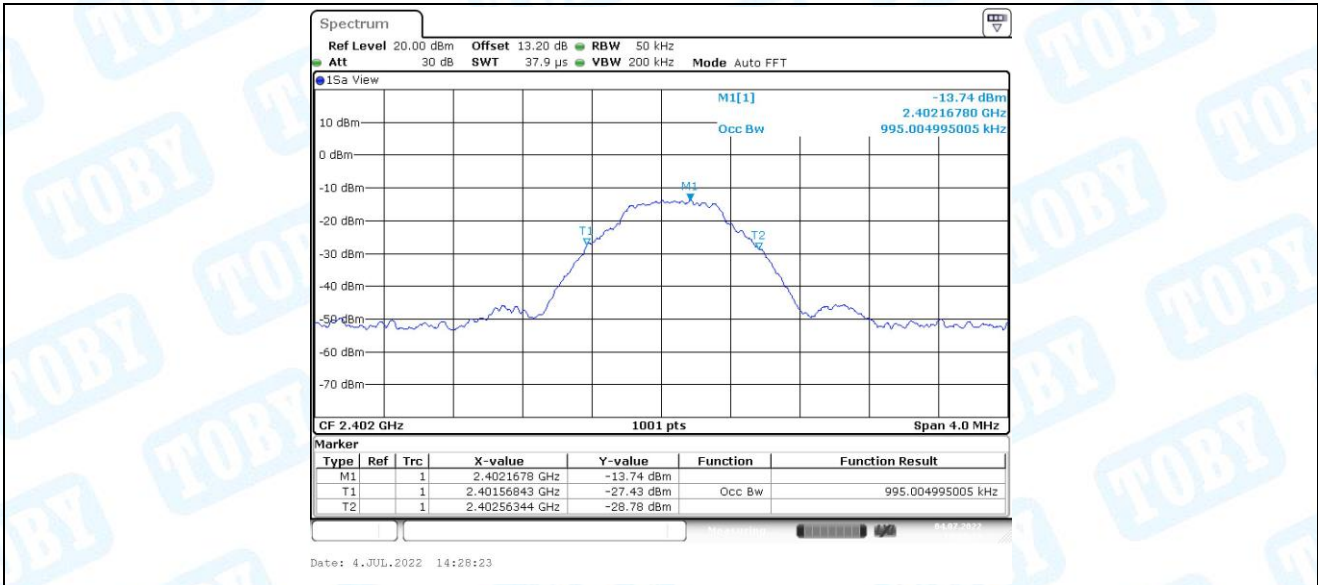
BLE_2M_Ant1_2480

2. Occupied Channel Bandwidth

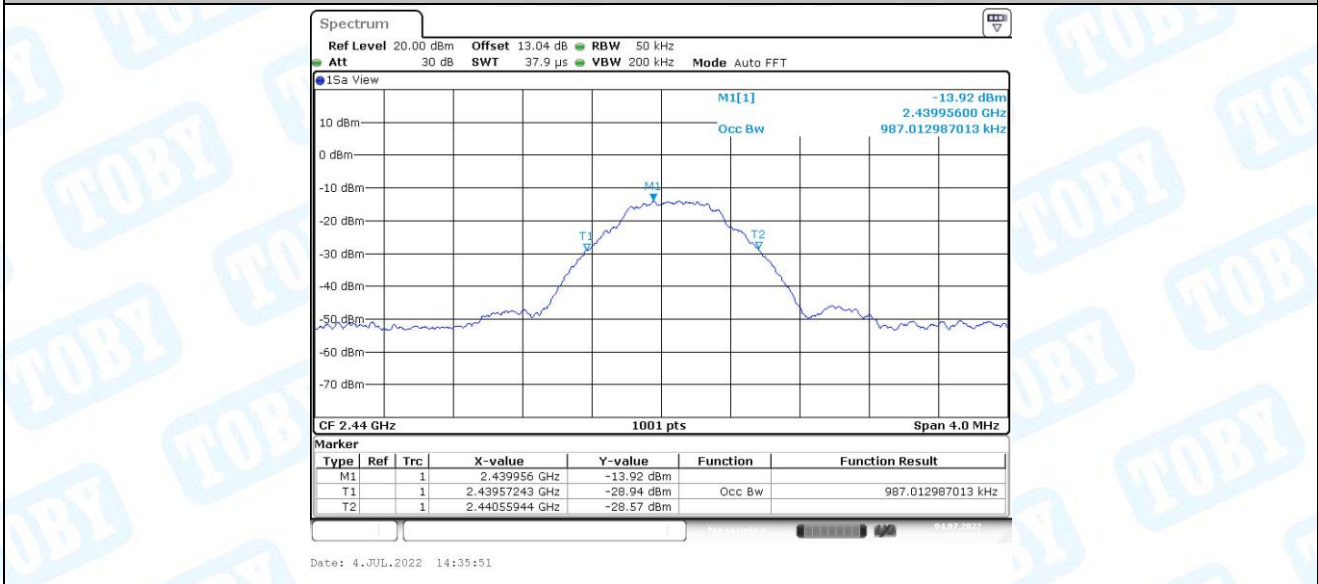
2.1. Test Result

| Test Mode | Antenna | Channel | OCB [MHz] | FL[MHz] | FH[MHz] | Limit[MHz] | Verdict |
|-----------|---------|---------|-----------|----------|----------|------------|---------|
| BLE_1M | Ant1 | 2402 | 0.995 | 2401.568 | 2402.563 | --- | --- |
| | | 2440 | 0.987 | 2439.572 | 2440.559 | --- | --- |
| | | 2480 | 0.983 | 2479.576 | 2480.559 | --- | --- |
| BLE_2M | Ant1 | 2402 | 1.974 | 2401.077 | 2403.051 | --- | --- |
| | | 2440 | 1.966 | 2439.089 | 2441.055 | --- | --- |
| | | 2480 | 1.962 | 2479.093 | 2481.055 | --- | --- |

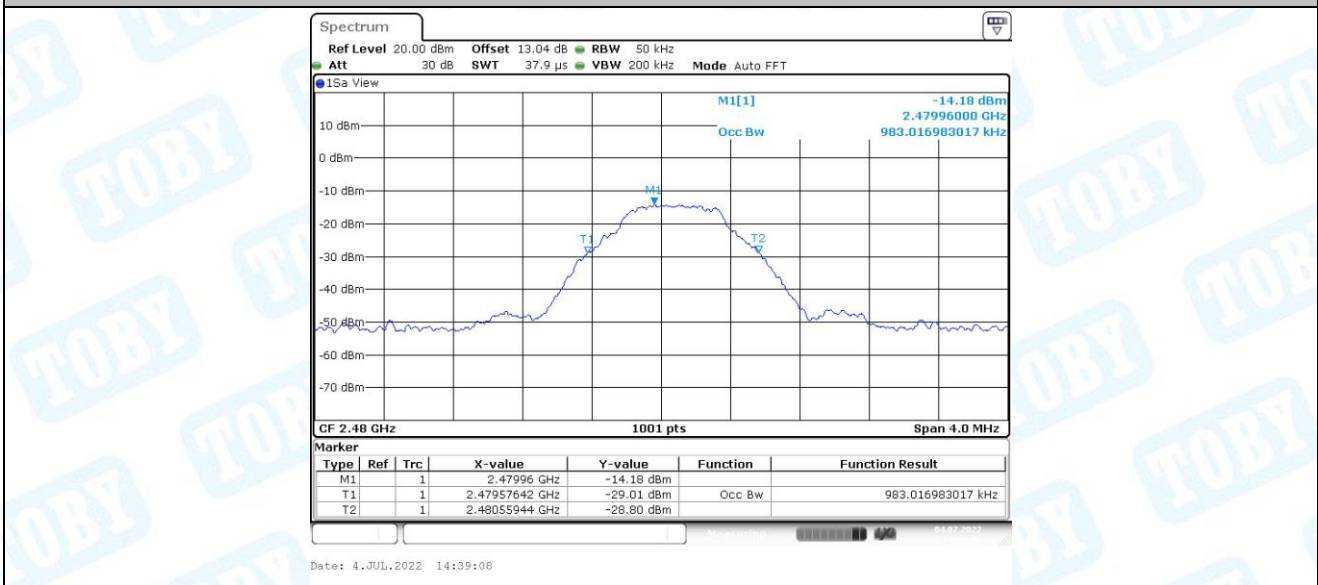
2.2. Test Graphs



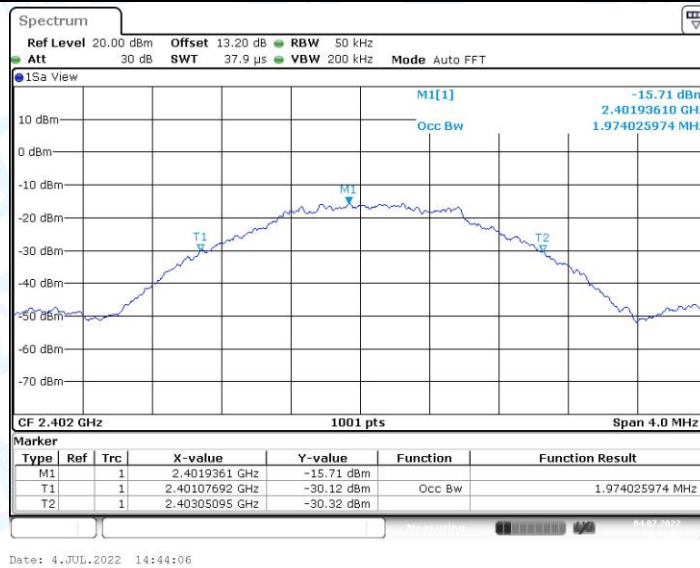
BLE_1M_Ant1_2402



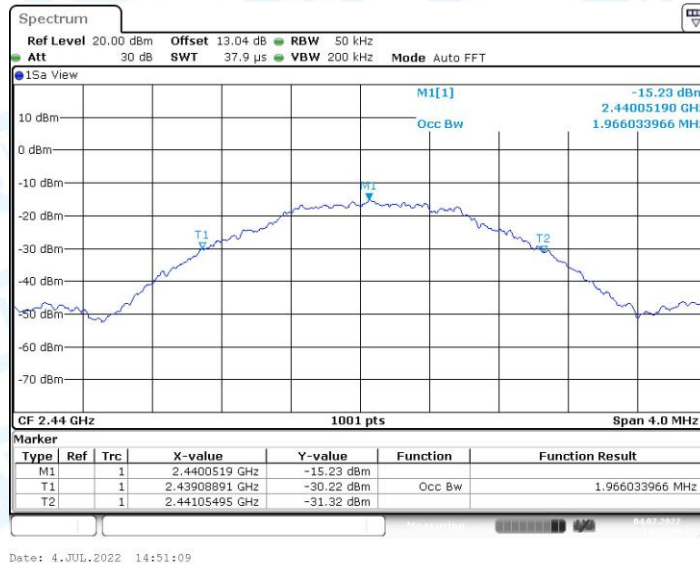
BLE_1M_Ant1_2440



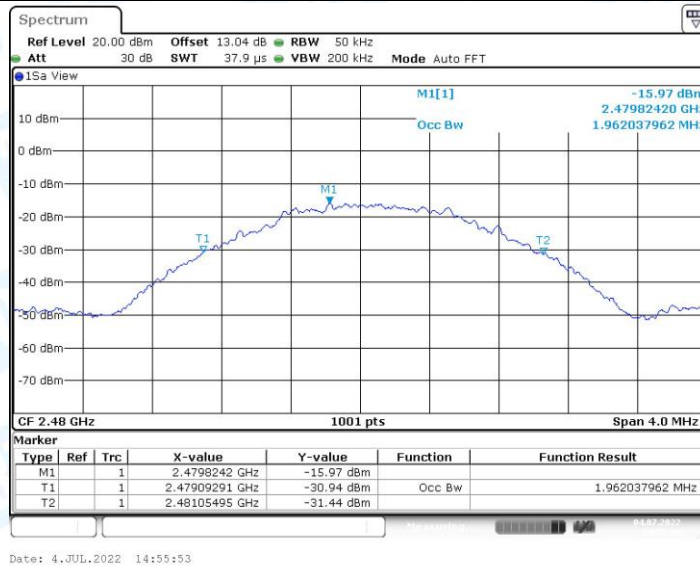
BLE_1M_Ant1_2480



BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



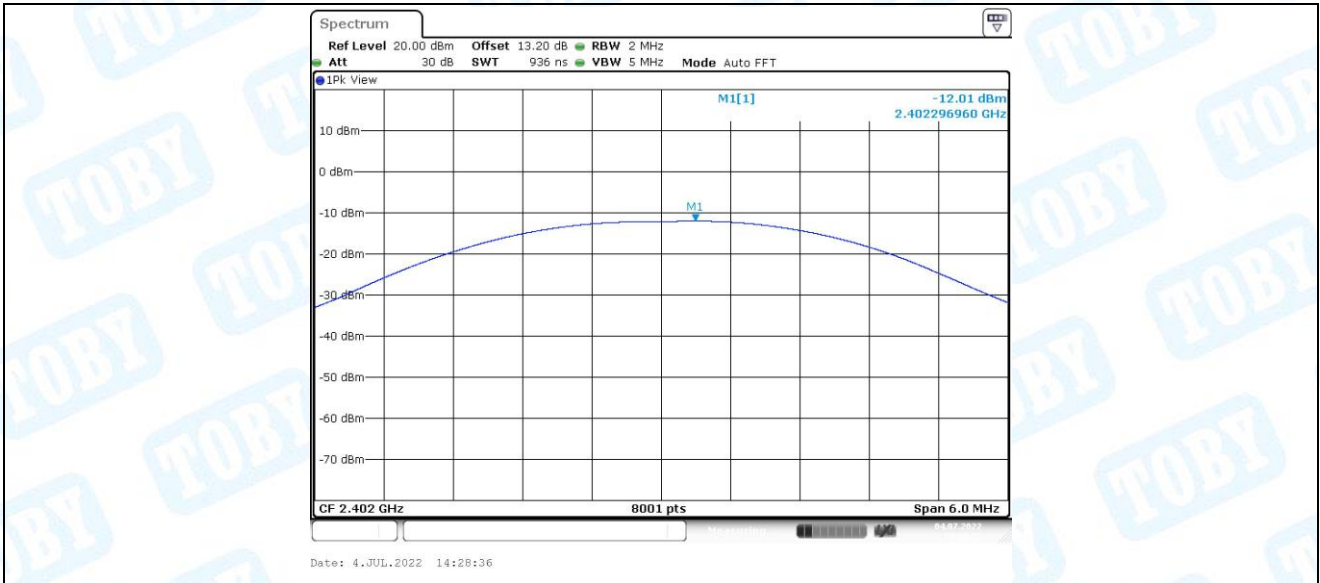
BLE_2M_Ant1_2480

3. Maximum conducted output power

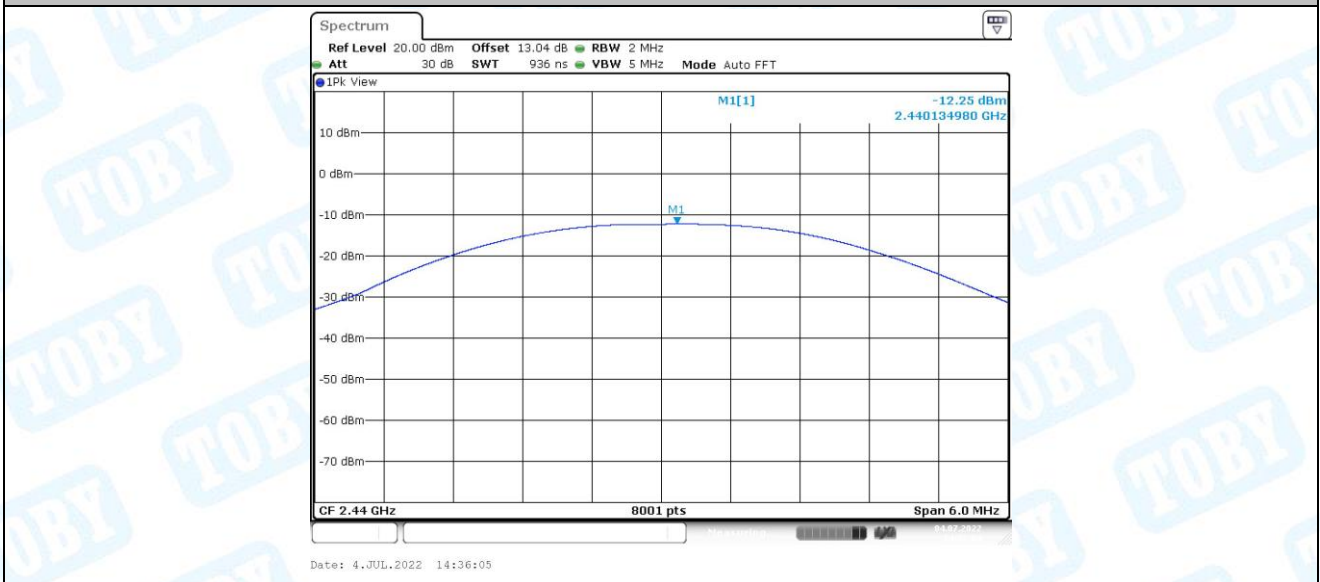
3.1. Test Result

| Test Mode | Antenna | Channel | Result[dBm] | Limit[dBm] | Verdict |
|-----------|---------|---------|-------------|------------|---------|
| BLE_1M | Ant1 | 2402 | -12.01 | ≤30 | PASS |
| | | 2440 | -12.25 | ≤30 | PASS |
| | | 2480 | -12.5 | ≤30 | PASS |
| BLE_2M | Ant1 | 2402 | -12.1 | ≤30 | PASS |
| | | 2440 | -12.12 | ≤30 | PASS |
| | | 2480 | -12.41 | ≤30 | PASS |

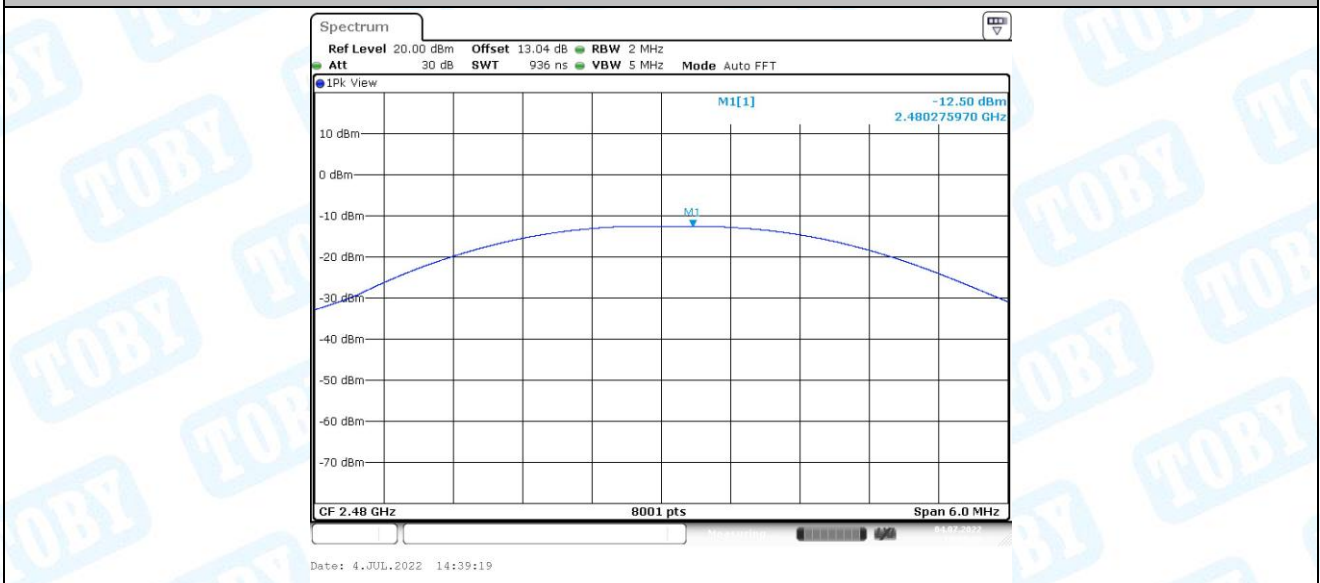
3.2. Test Graphs



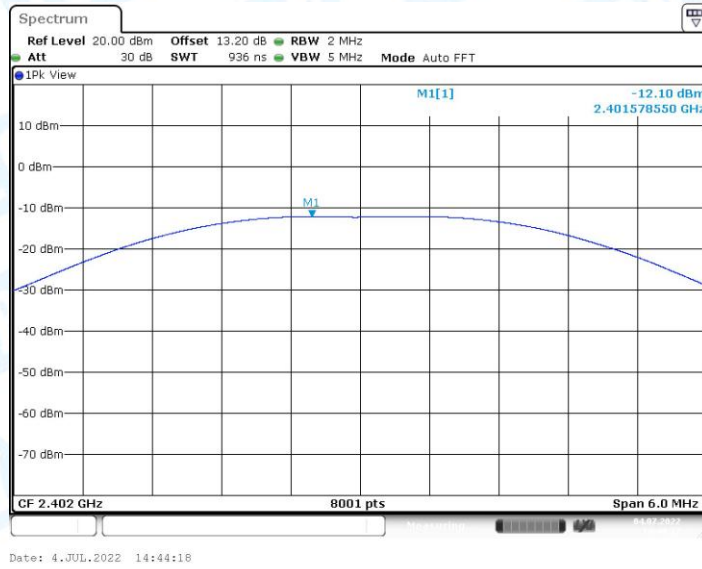
BLE_1M_Ant1_2402



BLE_1M_Ant1_2440



BLE_1M_Ant1_2480



BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



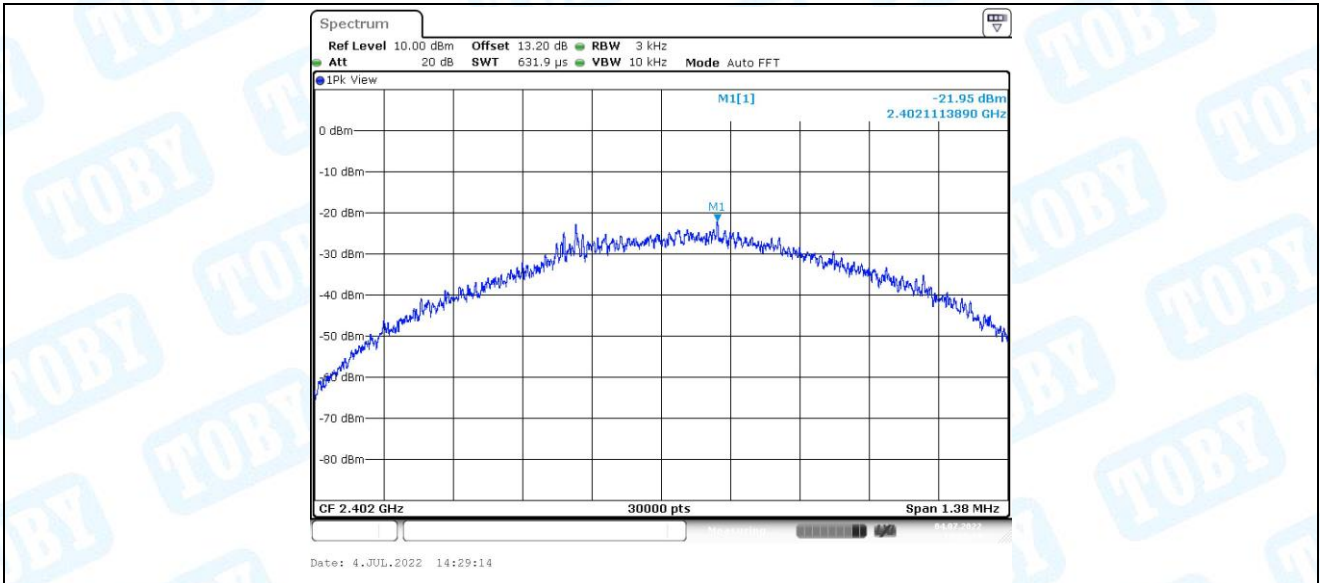
BLE_2M_Ant1_2480

4. Maximum power spectral density

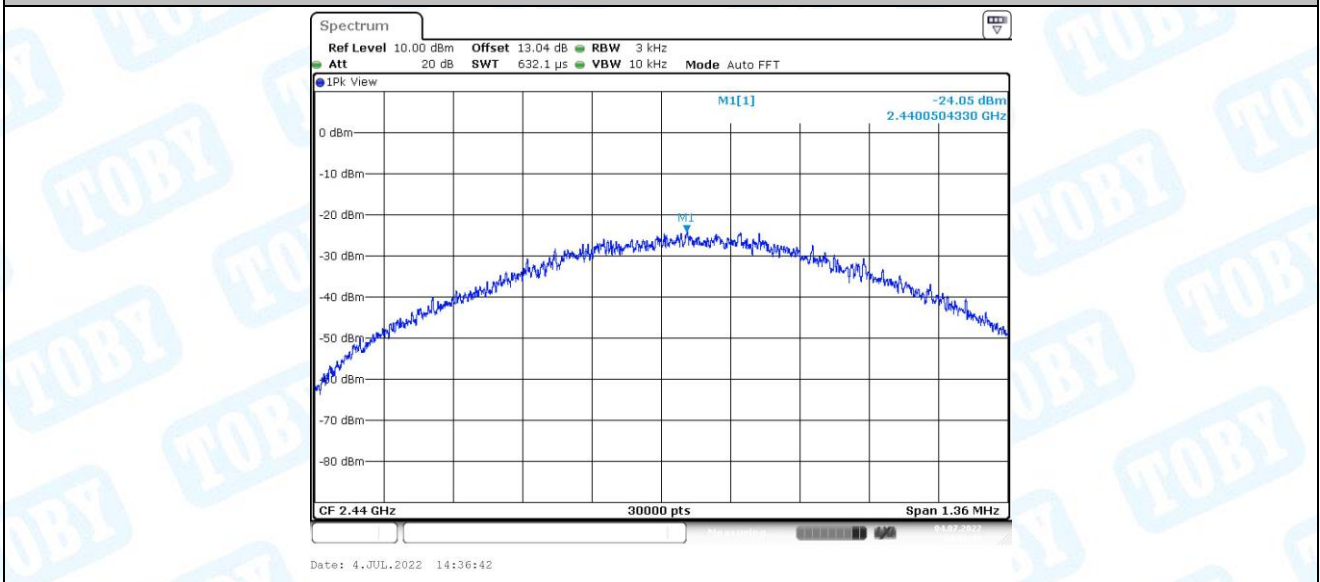
4.1. Test Result

| Test Mode | Antenna | Channel | Result[dBm/3kHz] | Limit[dBm/3kHz] | Verdict |
|-----------|---------|---------|------------------|-----------------|---------|
| BLE_1M | Ant1 | 2402 | -21.95 | ≤8.00 | PASS |
| | | 2440 | -24.05 | ≤8.00 | PASS |
| | | 2480 | -21.44 | ≤8.00 | PASS |
| BLE_2M | Ant1 | 2402 | -25.86 | ≤8.00 | PASS |
| | | 2440 | -25.95 | ≤8.00 | PASS |
| | | 2480 | -26.31 | ≤8.00 | PASS |

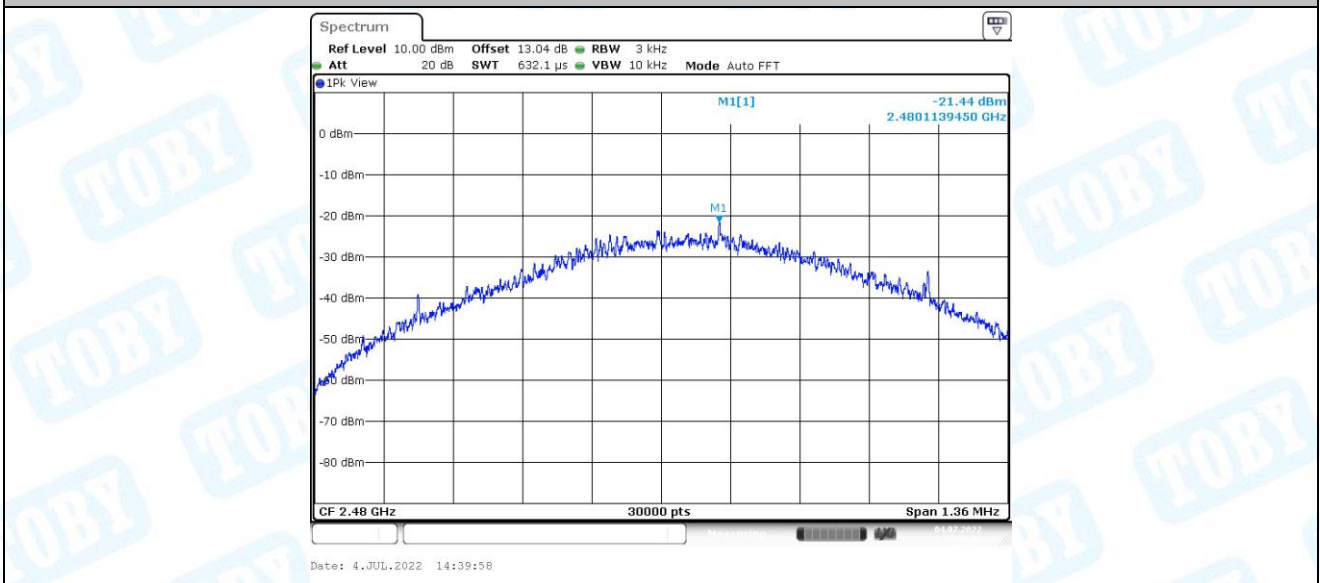
4.2. Test Graphs



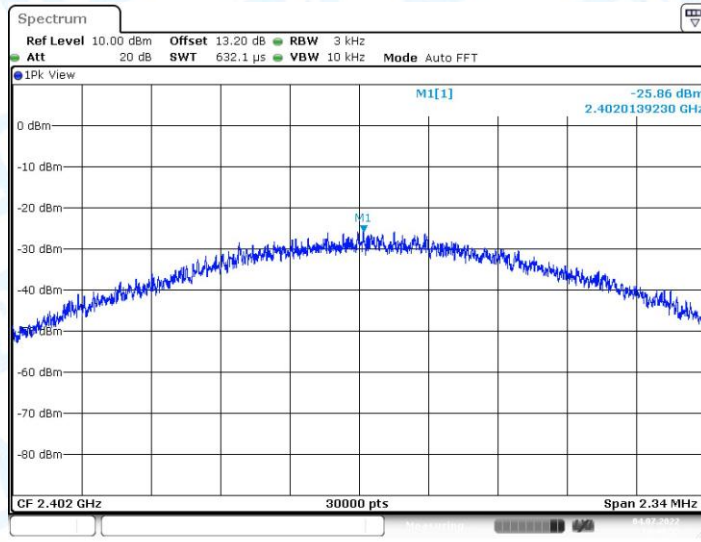
BLE_1M_Ant1_2402



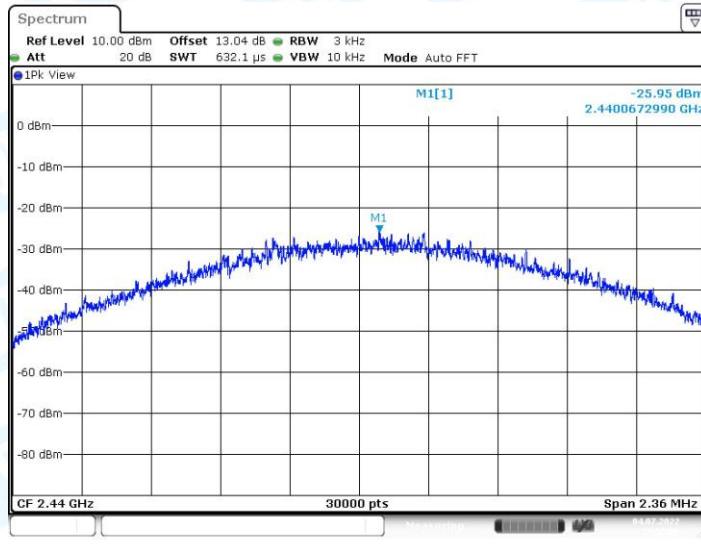
BLE_1M_Ant1_2440



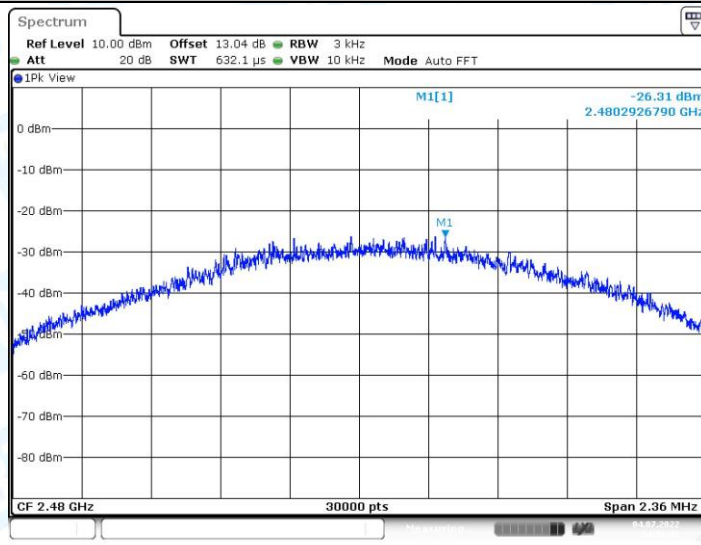
BLE_1M_Ant1_2480



BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



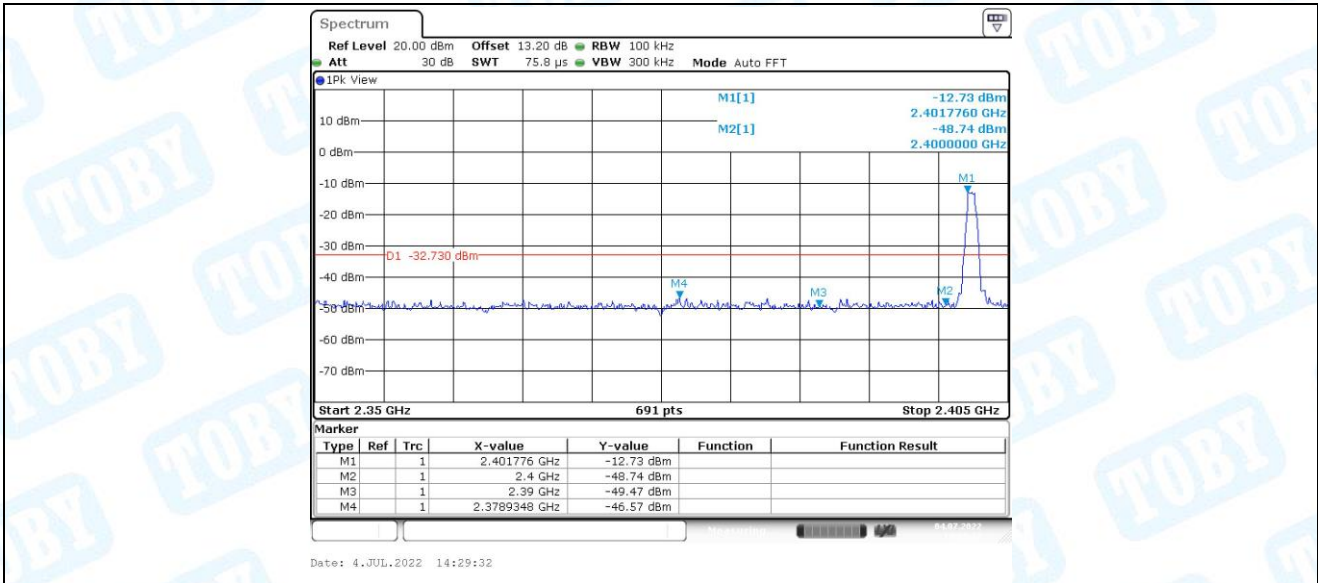
BLE_2M_Ant1_2480

5. Band edge measurements

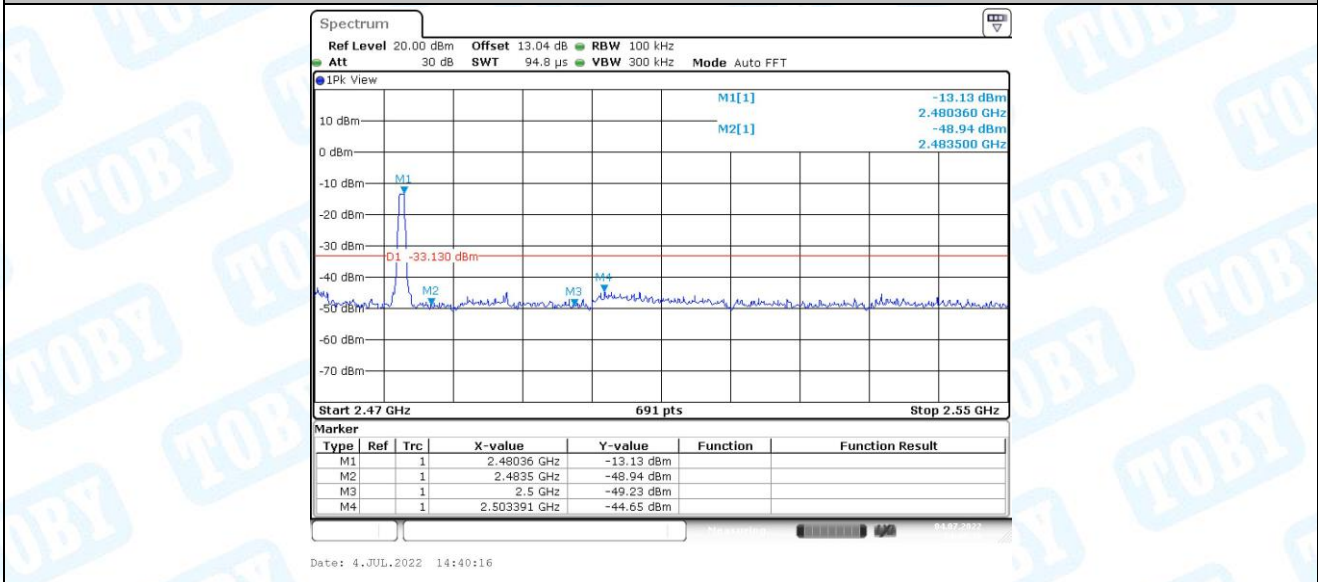
5.1. Test Result

| Test Mode | Antenna | ChName | Channel | Ref.Level[dBm] | Result[dBm] | Limit[dBm] | Verdict |
|-----------|---------|--------|---------|----------------|-------------|---------------|---------|
| BLE_1M | Ant1 | Low | 2402 | -12.73 | -46.57 | ≤ -32.73 | PASS |
| | | High | 2480 | -13.13 | -44.65 | ≤ -33.13 | PASS |
| BLE_2M | Ant1 | Low | 2402 | -13.91 | -45.8 | ≤ -33.91 | PASS |
| | | High | 2480 | -14.25 | -44.33 | ≤ -34.25 | PASS |

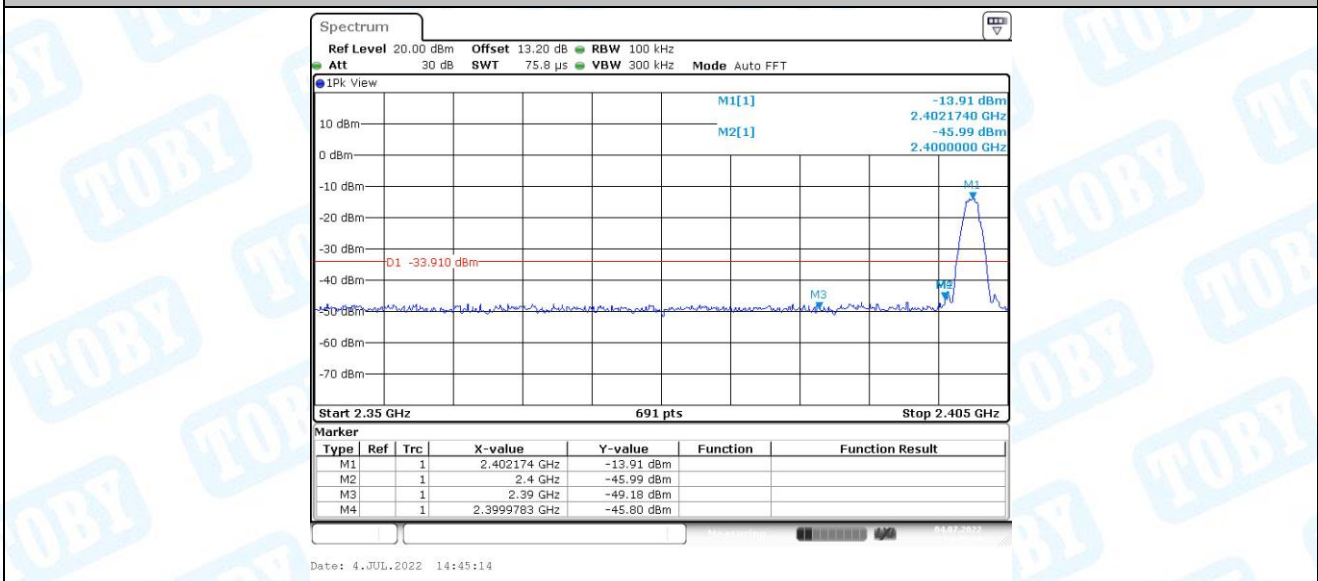
5.2. Test Graphs



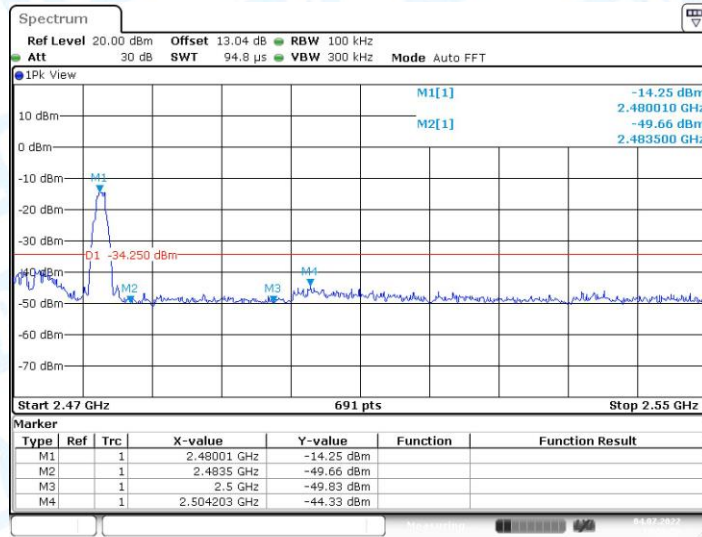
BLE_1M_Ant1_Low_2402



BLE_1M_Ant1_High_2480



BLE_2M_Ant1_Low_2402



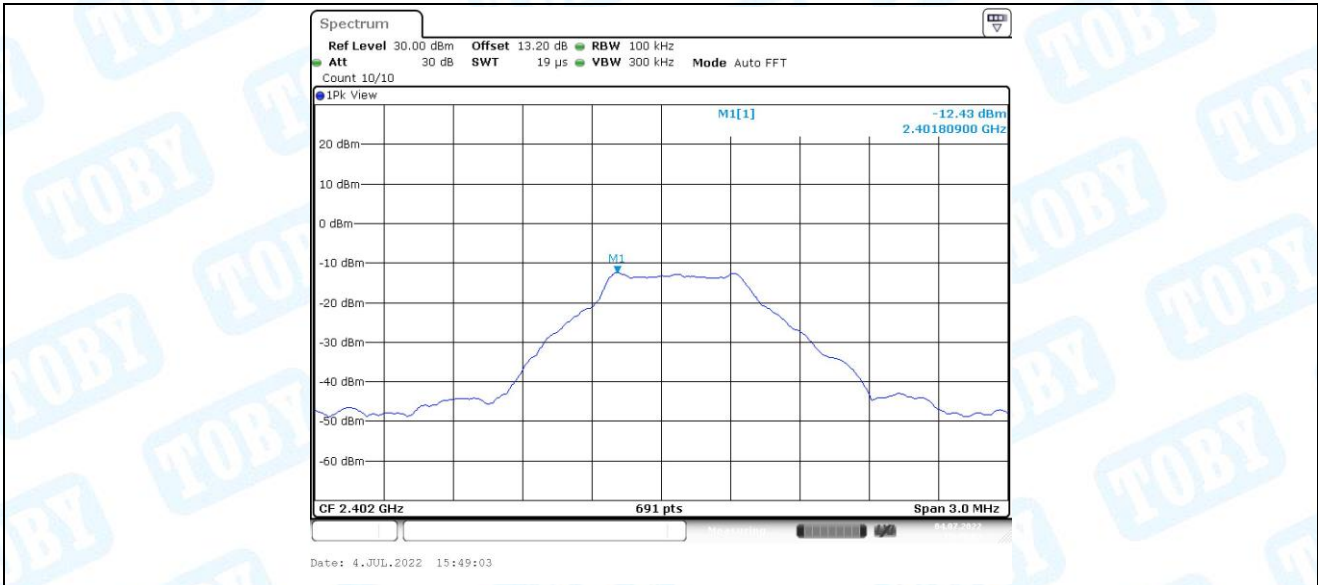
BLE_2M_Ant1_High_2480

6. Conducted Spurious Emission

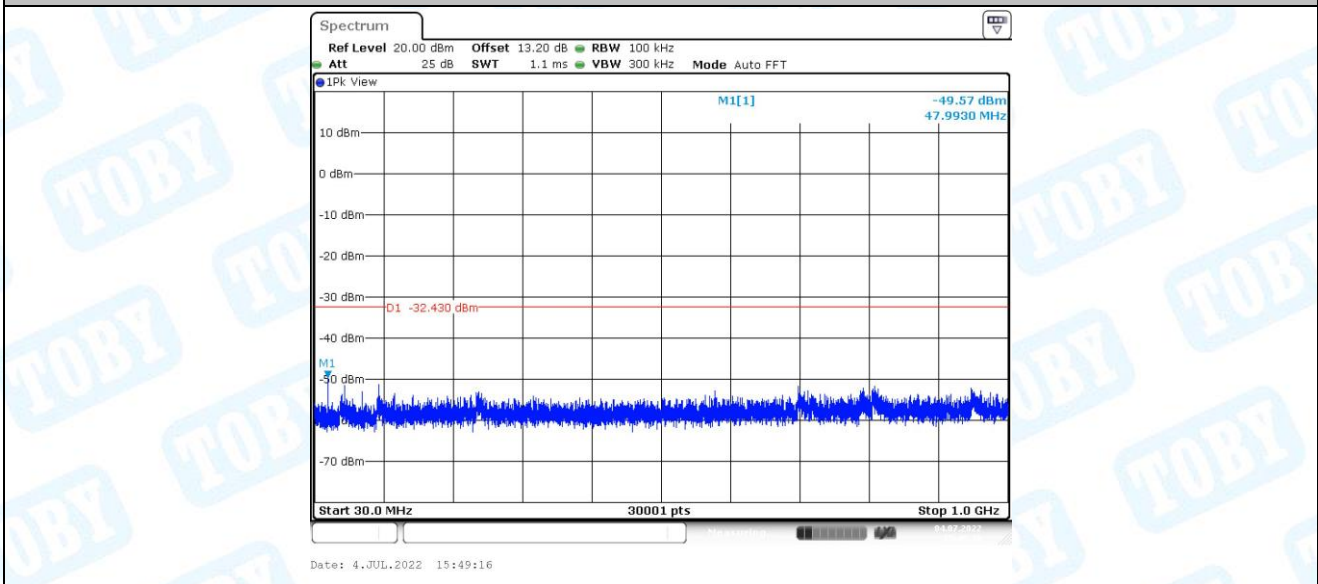
6.1. Test Result

| Test Mode | Antenna | Channel | Freq. Range [MHz] | Ref. Level [dBm] | Result[dBm] | Limit[dBm] | Verdict |
|-----------|---------|---------|-------------------|------------------|-------------|------------|---------|
| BLE_1M | Ant1 | 2402 | Reference | -12.43 | -12.43 | --- | PASS |
| | | | 30~1000 | -12.43 | -49.57 | ≤-32.43 | PASS |
| | | | 1000~26500 | -12.43 | -43.16 | ≤-32.43 | PASS |
| | | 2440 | Reference | -12.97 | -12.97 | --- | PASS |
| | | | 30~1000 | -12.97 | -50.05 | ≤-32.97 | PASS |
| | | | 1000~26500 | -12.97 | -42.43 | ≤-32.97 | PASS |
| | | 2480 | Reference | -13.19 | -13.19 | --- | PASS |
| | | | 30~1000 | -13.19 | -49.72 | ≤-33.19 | PASS |
| | | | 1000~26500 | -13.19 | -41.51 | ≤-33.19 | PASS |
| BLE_2M | Ant1 | 2402 | Reference | -13.87 | -13.87 | --- | PASS |
| | | | 30~1000 | -13.87 | -48.78 | ≤-33.87 | PASS |
| | | | 1000~26500 | -13.87 | -43.16 | ≤-33.87 | PASS |
| | | 2440 | Reference | -14.14 | -14.14 | --- | PASS |
| | | | 30~1000 | -14.14 | -49.47 | ≤-34.14 | PASS |
| | | | 1000~26500 | -14.14 | -44.36 | ≤-34.14 | PASS |
| | | 2480 | Reference | -14.48 | -14.48 | --- | PASS |
| | | | 30~1000 | -14.48 | -50.96 | ≤-34.48 | PASS |
| | | | 1000~26500 | -14.48 | -41.44 | ≤-34.48 | PASS |

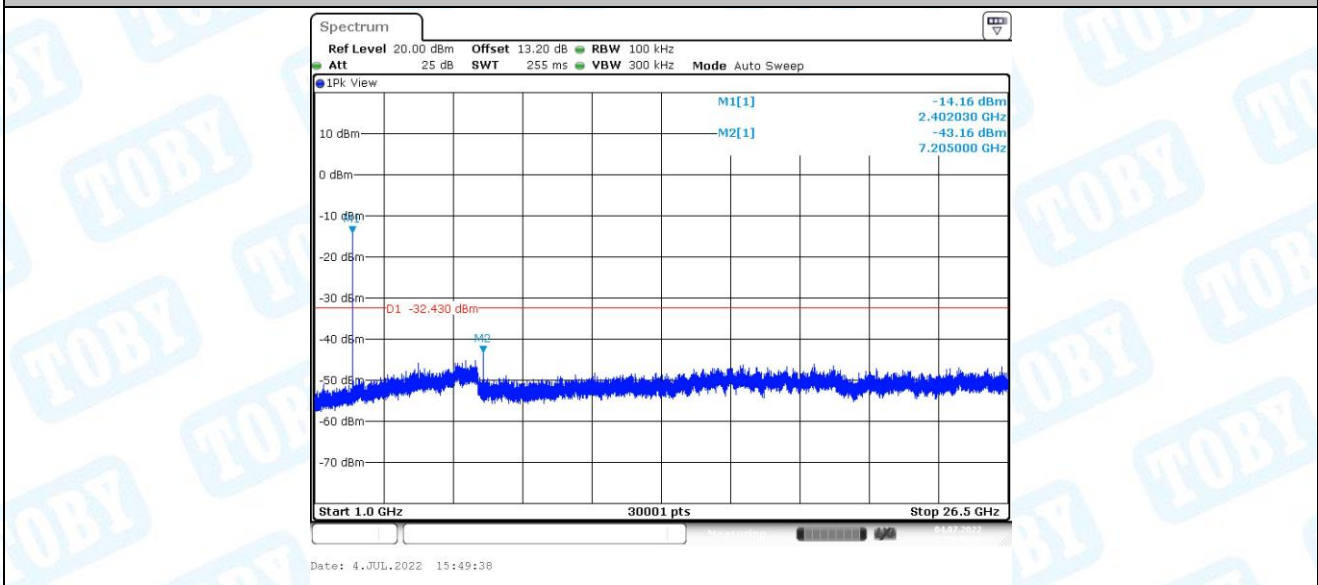
6.2. Test Graphs



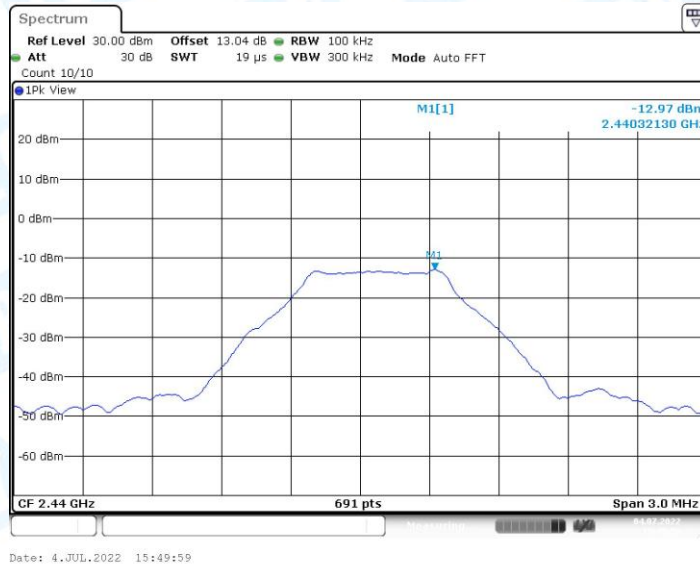
BLE_1M_Ant1_2402_0~Reference



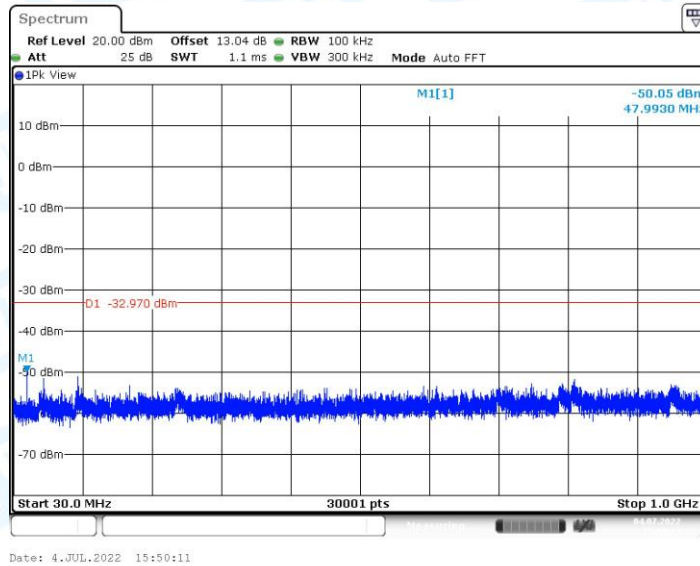
BLE_1M_Ant1_2402_30~1000



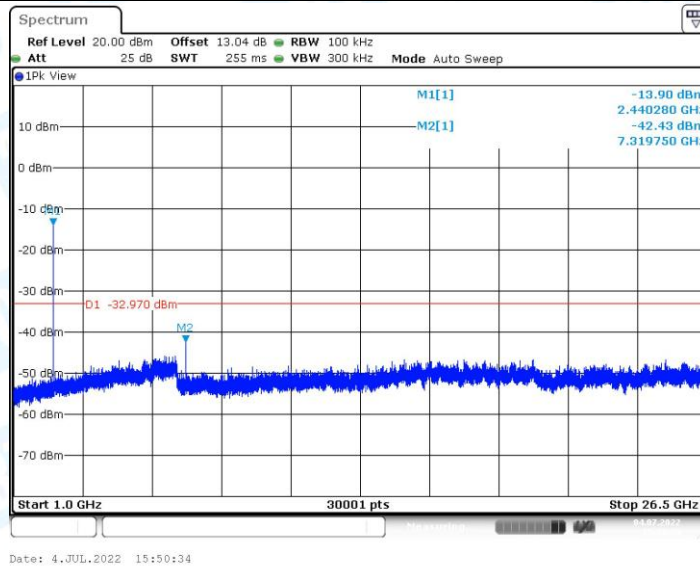
BLE_1M_Ant1_2402_1000~26500



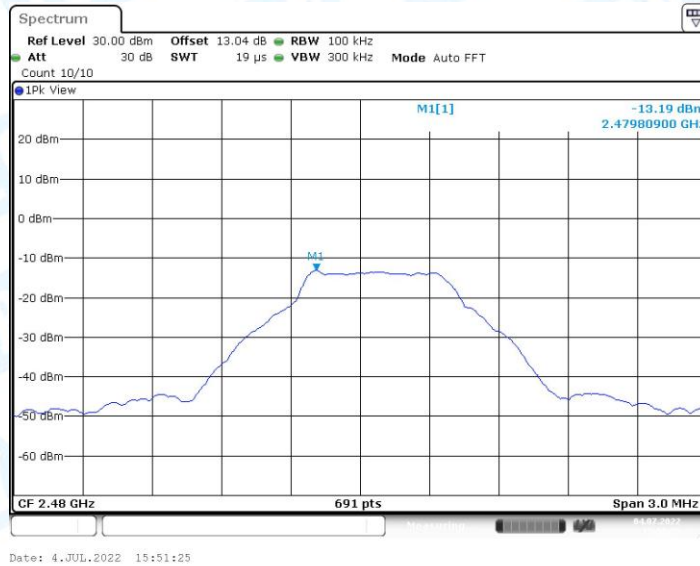
BLE_1M_Ant1_2440_0~Reference



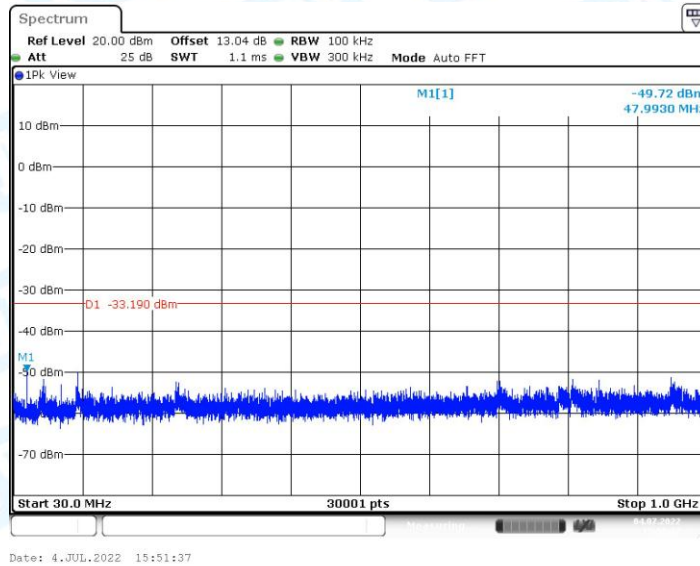
BLE_1M_Ant1_2440_30~1000



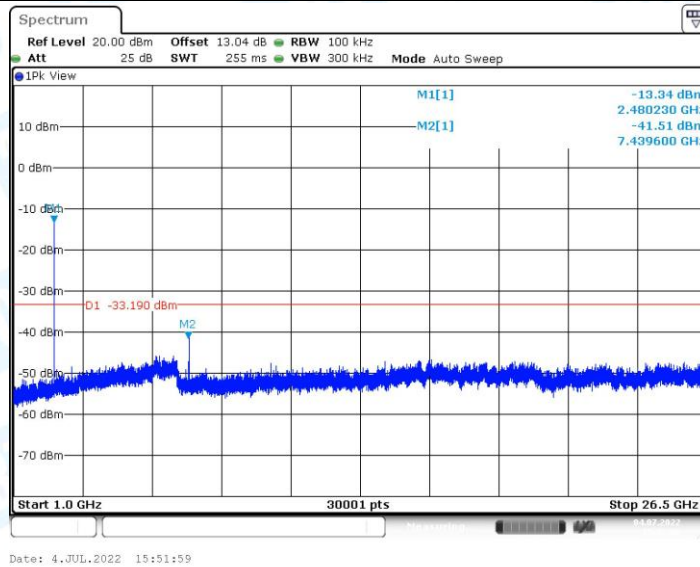
BLE_1M_Ant1_2440_1000~26500



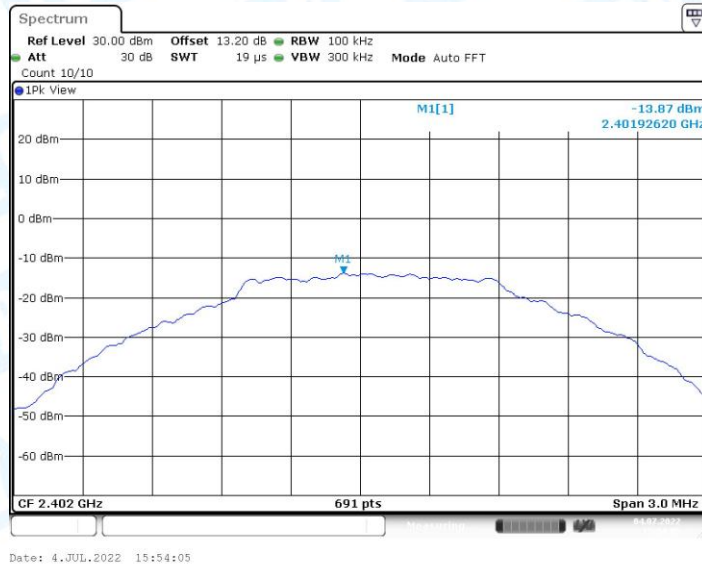
BLE_1M_Ant1_2480_0~Reference



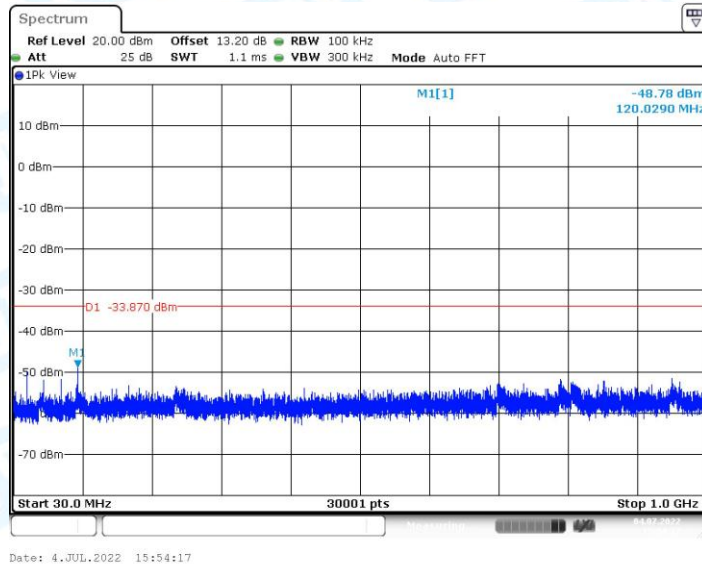
BLE_1M_Ant1_2480_30~1000



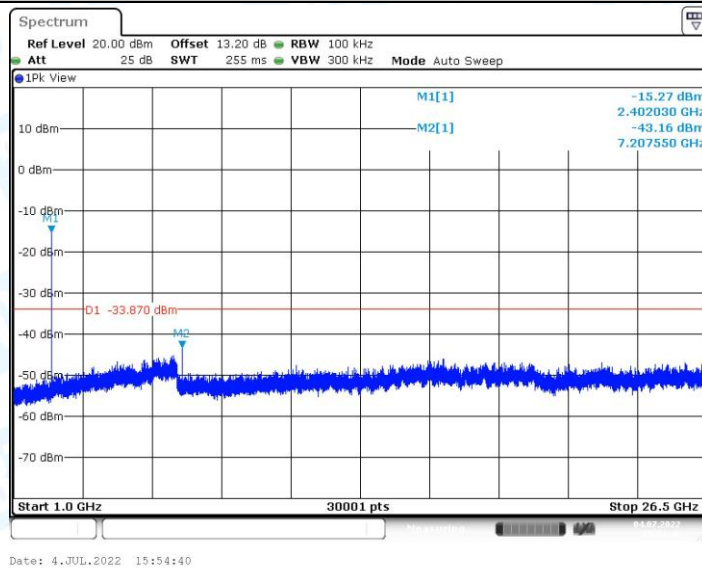
BLE_1M_Ant1_2480_1000~26500



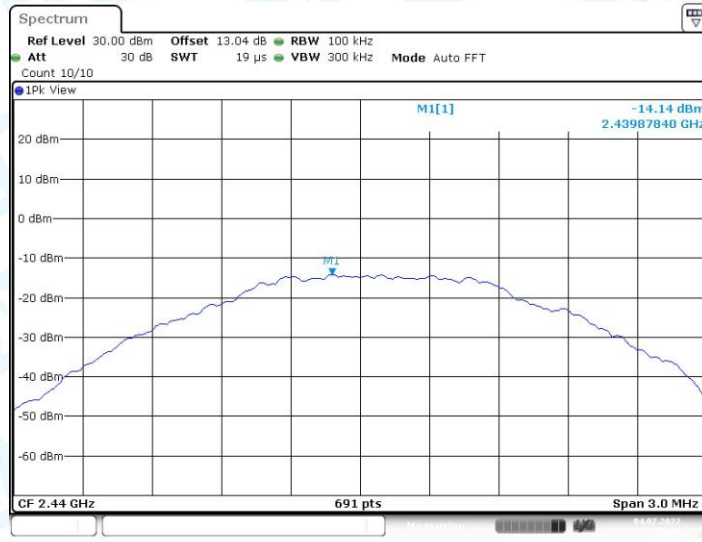
BLE_2M_Ant1_2402_0~Reference



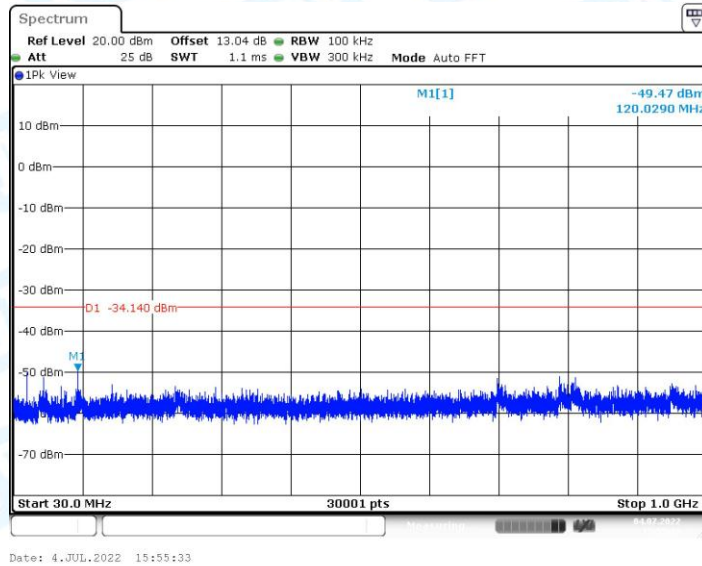
BLE_2M_Ant1_2402_30~1000



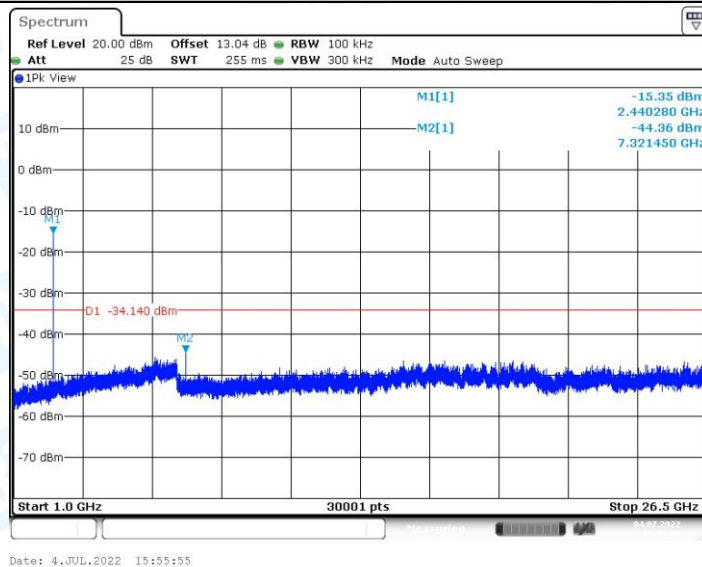
BLE_2M_Ant1_2402_1000~26500



BLE_2M_Ant1_2440_0~Reference



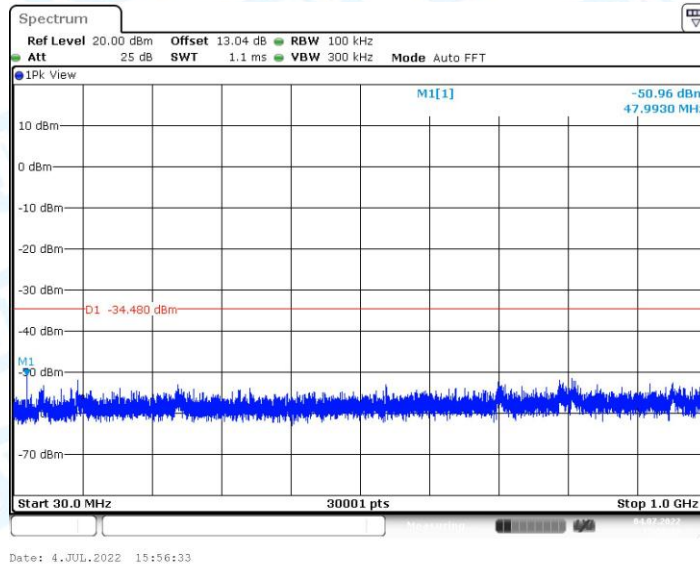
BLE_2M_Ant1_2440_30~1000



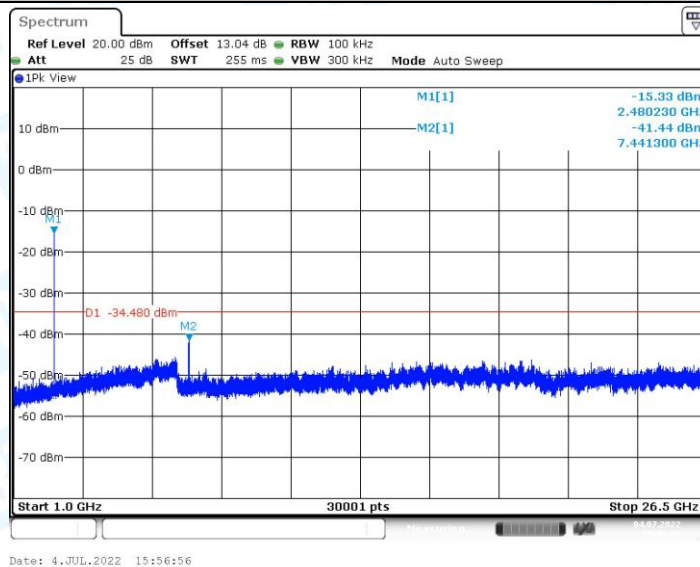
BLE_2M_Ant1_2440_1000~26500



BLE_2M_Ant1_2480_0~Reference



BLE_2M_Ant1_2480_30~1000



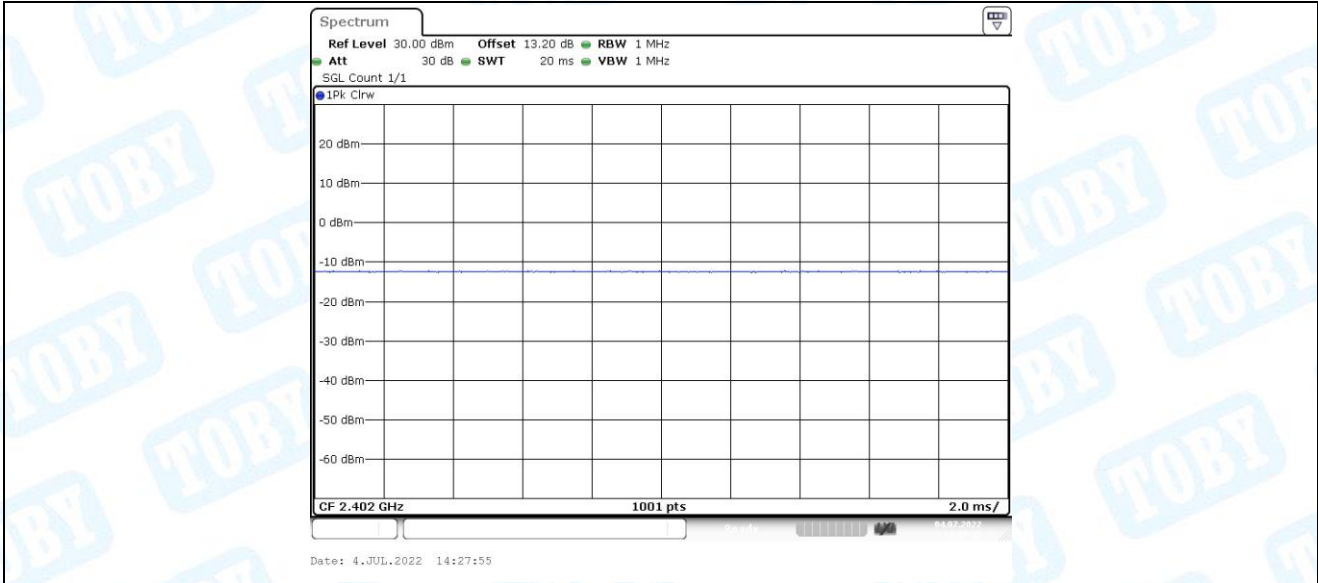
BLE_2M_Ant1_2480_1000~26500

7. Duty Cycle

7.1. Test Result

| Test Mode | Antenna | Channel | Transmission Duration [ms] | Transmission Period [ms] | Duty Cycle [%] | Limit | Verdict |
|-----------|---------|---------|----------------------------|--------------------------|----------------|-------|---------|
| BLE_1M | Ant1 | 2402 | 0.00 | 0.00 | 100.00 | --- | --- |
| | | 2440 | 0.00 | 0.00 | 100.00 | --- | --- |
| | | 2480 | 0.00 | 0.00 | 100.00 | --- | --- |
| BLE_2M | Ant1 | 2402 | 0.00 | 0.00 | 100.00 | --- | --- |
| | | 2440 | 0.00 | 0.00 | 100.00 | --- | --- |
| | | 2480 | 0.00 | 0.00 | 100.00 | --- | --- |

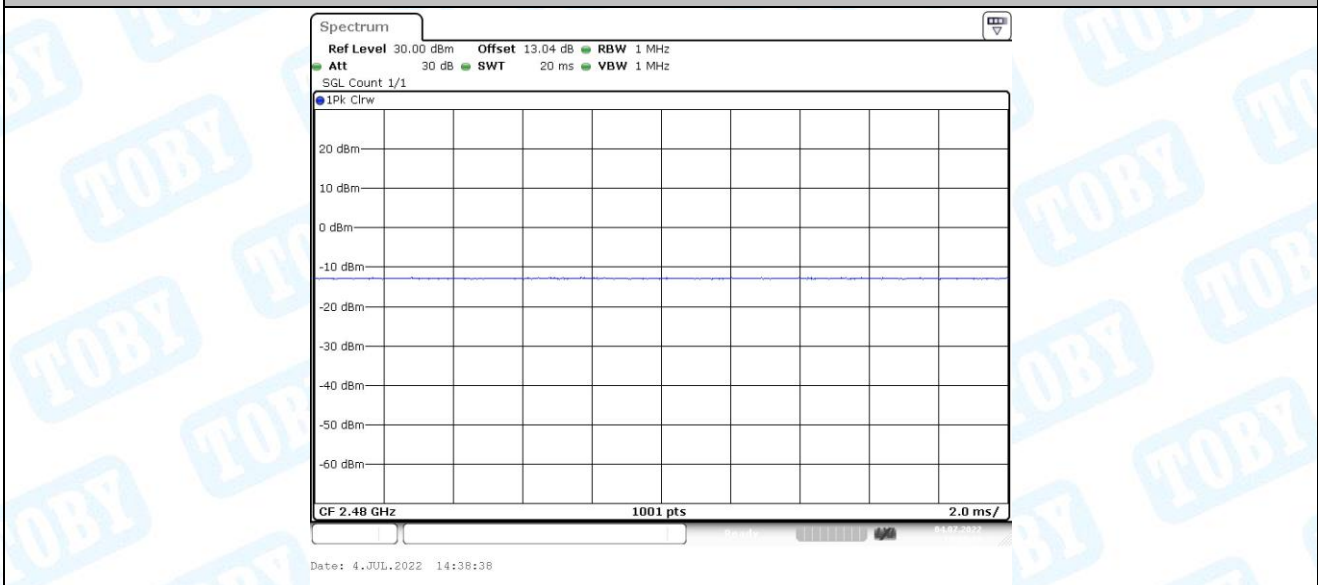
7.2. Test Graphs



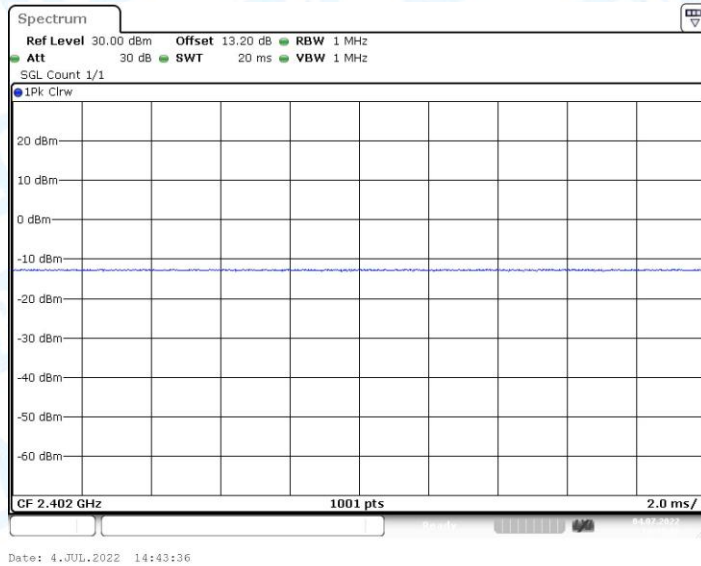
BLE_1M_Ant1_2402



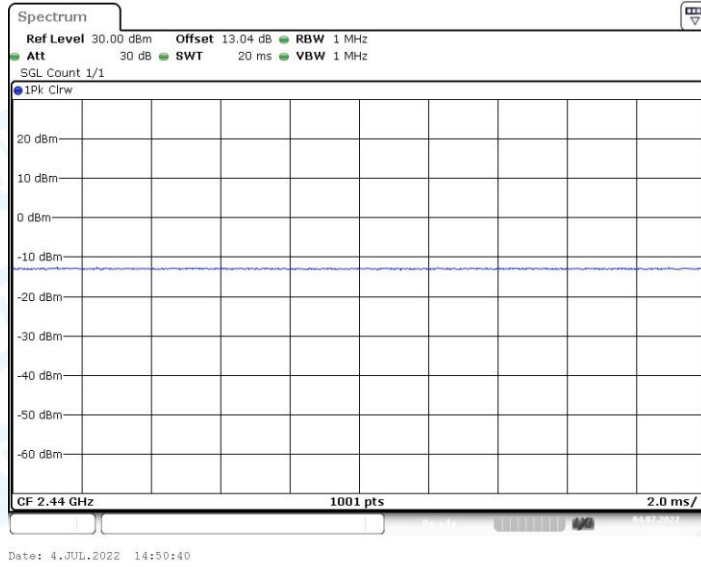
BLE_1M_Ant1_2440



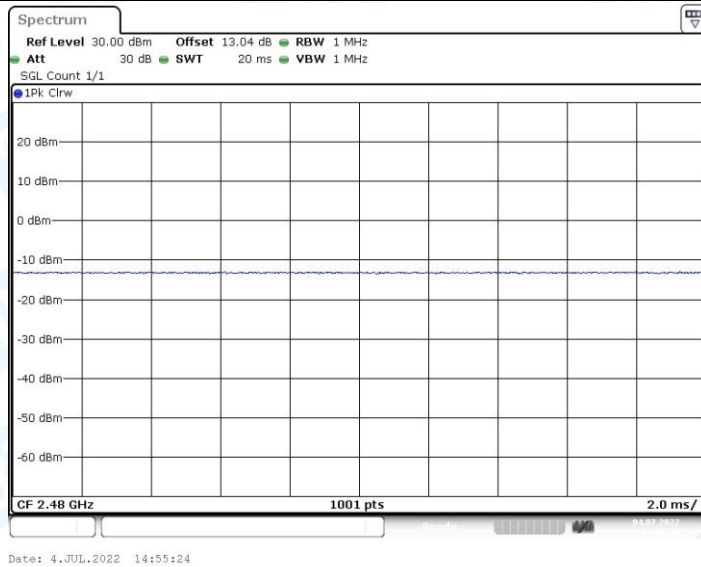
BLE_1M_Ant1_2480



BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



BLE_2M_Ant1_2480

8. Emissions in Restricted Bands

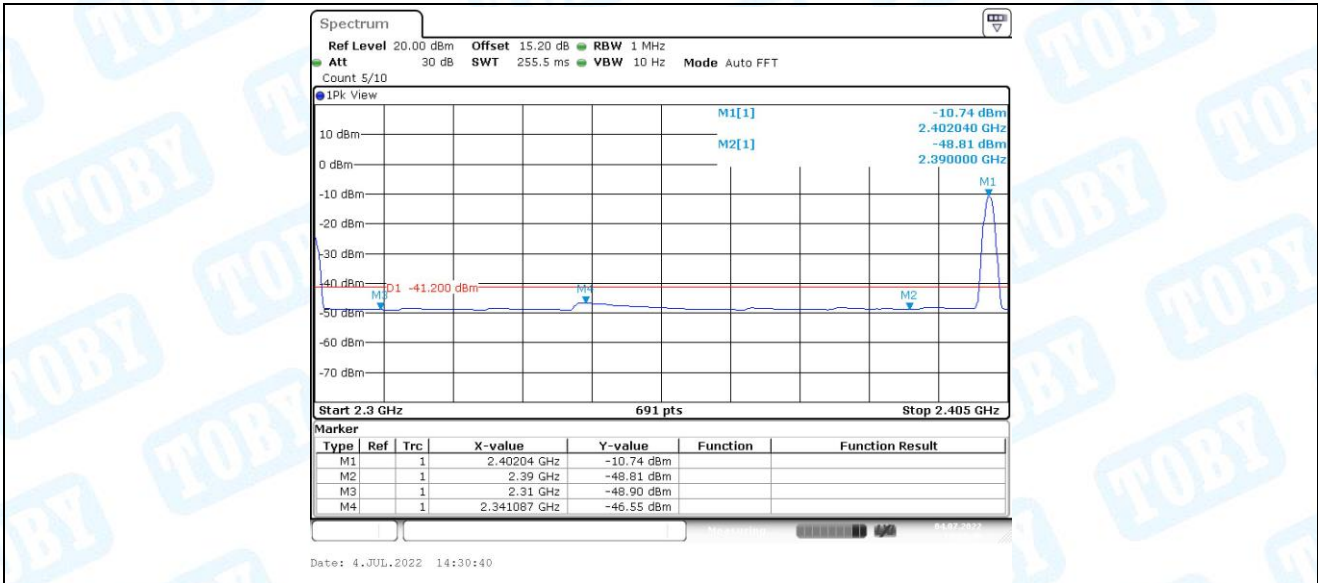
8.1. Test Result

| Test Mode | Antenna | ChName | Channel | Detector | Freq. [MHz] | Result [dBm] | Limit [dBm] | Verdict |
|-----------|---------|--------|---------|----------|-------------|--------------|-------------|---------|
| BLE_1M | Ant1 | Low | 2402 | AV | 2310.000 | -48.9 | ≤-41.20 | PASS |
| | | | | AV | 2341.087 | -46.55 | ≤-41.20 | PASS |
| | | | | AV | 2390.000 | -48.81 | ≤-41.20 | PASS |
| | | | | Peak | 2310.000 | -37.6 | ≤-21.20 | PASS |
| | | | | Peak | 2340.174 | -33.18 | ≤-21.20 | PASS |
| | | | | Peak | 2390.000 | -37.41 | ≤-21.20 | PASS |
| | | High | 2480 | AV | 2483.500 | -48.03 | ≤-41.20 | PASS |
| | | | | AV | 2497.246 | -47.8 | ≤-41.20 | PASS |
| | | | | AV | 2500.000 | -48.09 | ≤-41.20 | PASS |
| | | | | Peak | 2483.500 | -37.37 | ≤-21.20 | PASS |
| | | | | Peak | 2491.333 | -34.72 | ≤-21.20 | PASS |
| | | | | Peak | 2500.000 | -37.22 | ≤-21.20 | PASS |
| BLE_2M | Ant1 | Low | 2402 | AV | 2310.000 | -48.89 | ≤-41.20 | PASS |
| | | | | AV | 2340.935 | -46.55 | ≤-41.20 | PASS |
| | | | | AV | 2390.000 | -48.78 | ≤-41.20 | PASS |
| | | | | Peak | 2310.000 | -37.14 | ≤-21.20 | PASS |
| | | | | Peak | 2340.022 | -33.88 | ≤-21.20 | PASS |
| | | | | Peak | 2390.000 | -37.52 | ≤-21.20 | PASS |
| | | High | 2480 | AV | 2483.500 | -47.98 | ≤-41.20 | PASS |
| | | | | AV | 2497.478 | -47.8 | ≤-41.20 | PASS |
| | | | | AV | 2500.000 | -48.1 | ≤-41.20 | PASS |
| | | | | Peak | 2483.500 | -38.47 | ≤-21.20 | PASS |
| | | | | Peak | 2484.261 | -35.34 | ≤-21.20 | PASS |
| | | | | Peak | 2500.000 | -35.59 | ≤-21.20 | PASS |

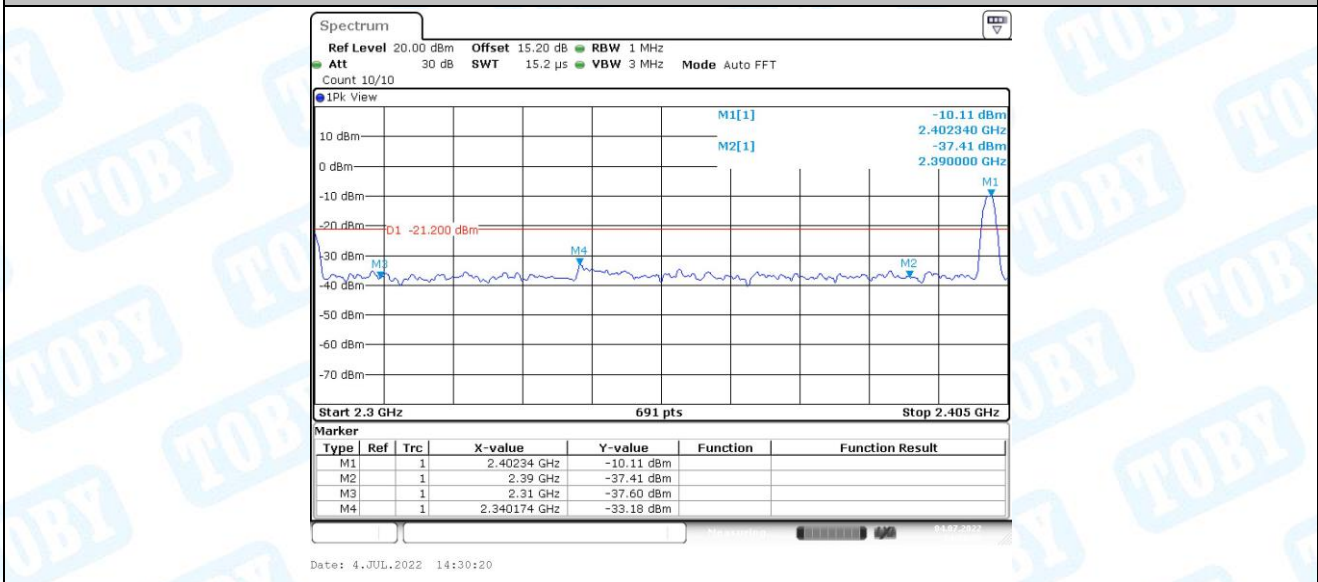
Note:

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.

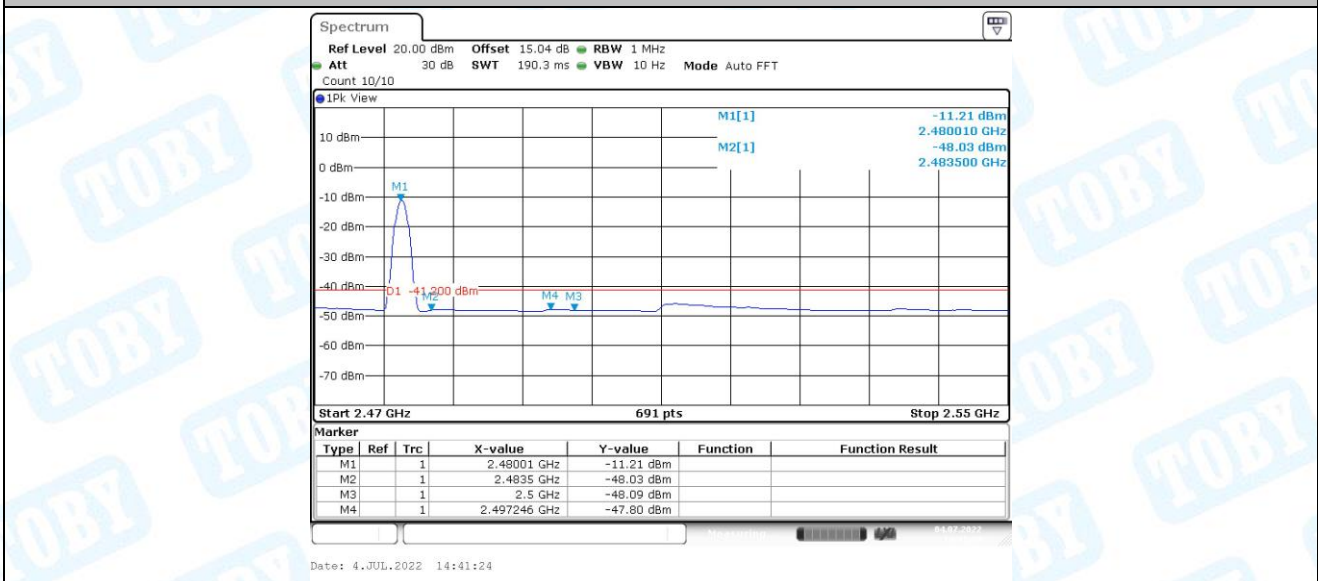
8.2. Test Graphs



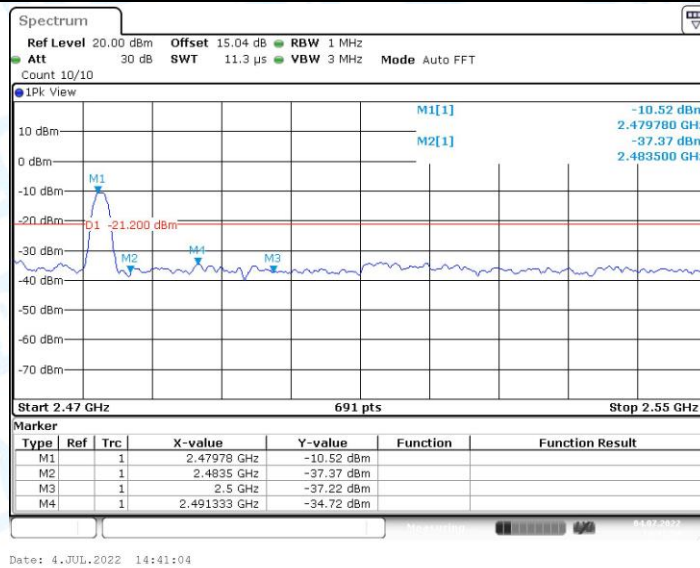
BLE_1M_Ant1_Low_2402_AV



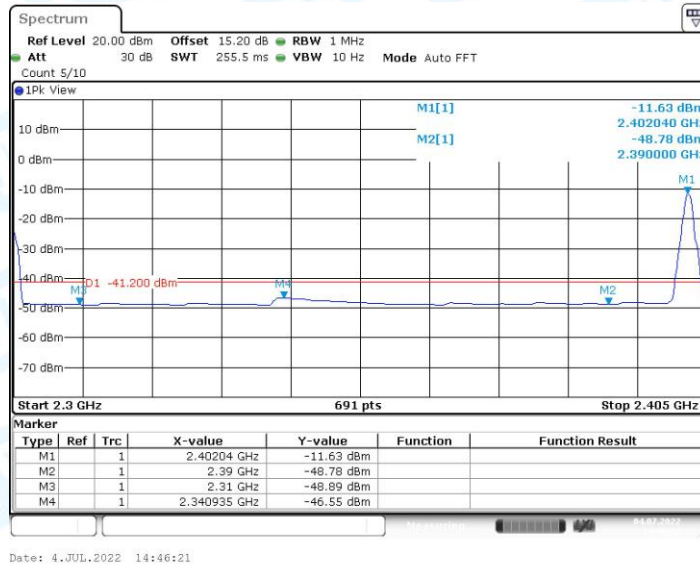
BLE_1M_Ant1_Low_2402_Peak



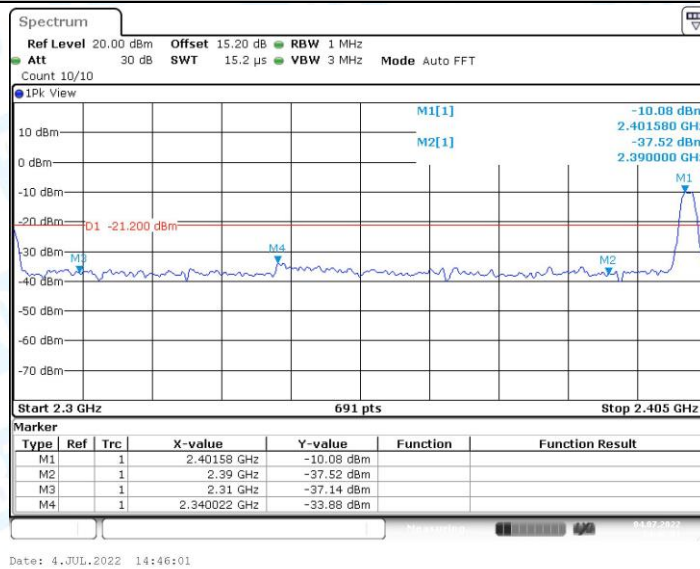
BLE_1M_Ant1_High_2480_AV



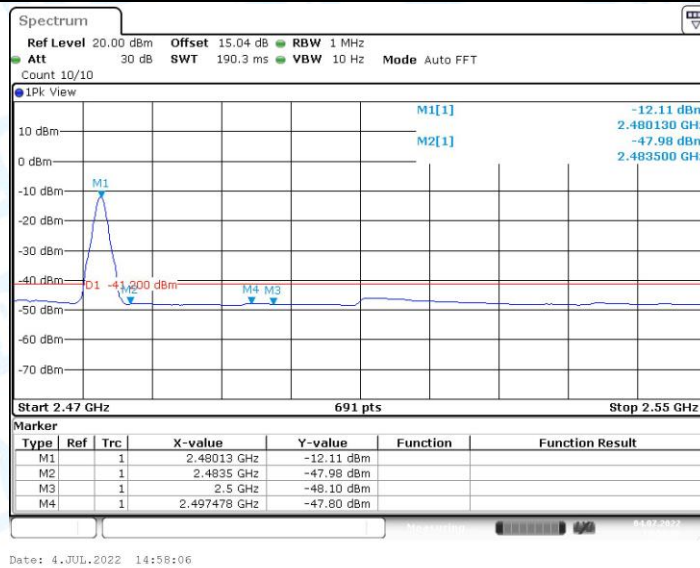
BLE_1M_Ant1_High_2480_Peak



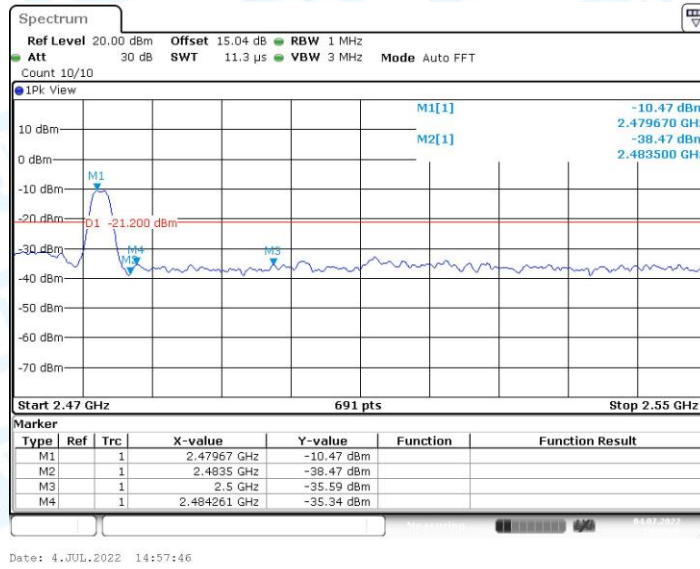
BLE_2M_Ant1_Low_2402_AV



BLE_2M_Ant1_Low_2402_Peak



BLE_2M_Ant1_High_2480_AV



BLE_2M_Ant1_High_2480_Peak

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