

RF Test Data for Bluetooth LE (Conducted Measurements)

| General Description of EUT | |
|--|---------------------------|
| Product Name: | WiFi & BT combo module |
| Test Model: | EWN-8822CSE3AA |
| Sample ID: | HC-C-202308-0079-01-03-2# |
| Environmental Conditions | |
| Temperature: | 25°C |
| Relative Humidity: | 55% |
| Test Voltage: | DC 3.3V |
| Test Engineer: | Li Ying Jing |
| Note: For a more detailed features description, please refer to the report TBR-C-202308-0079-21 The report only show the worst case data. | |

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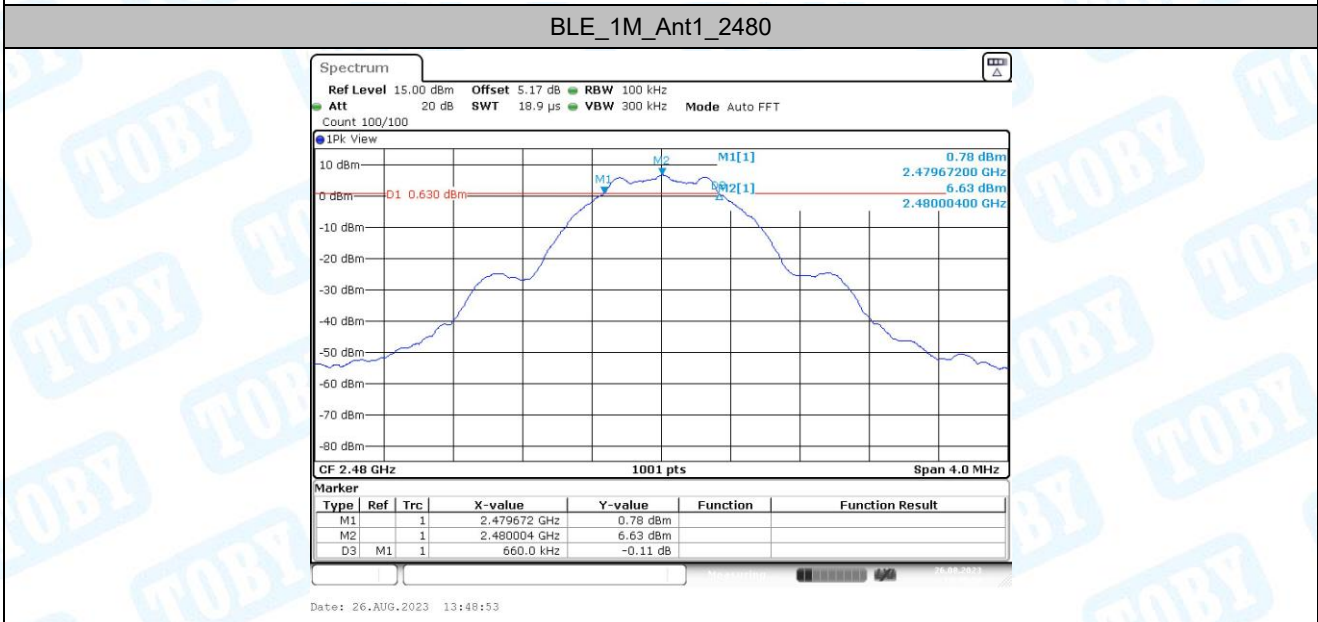
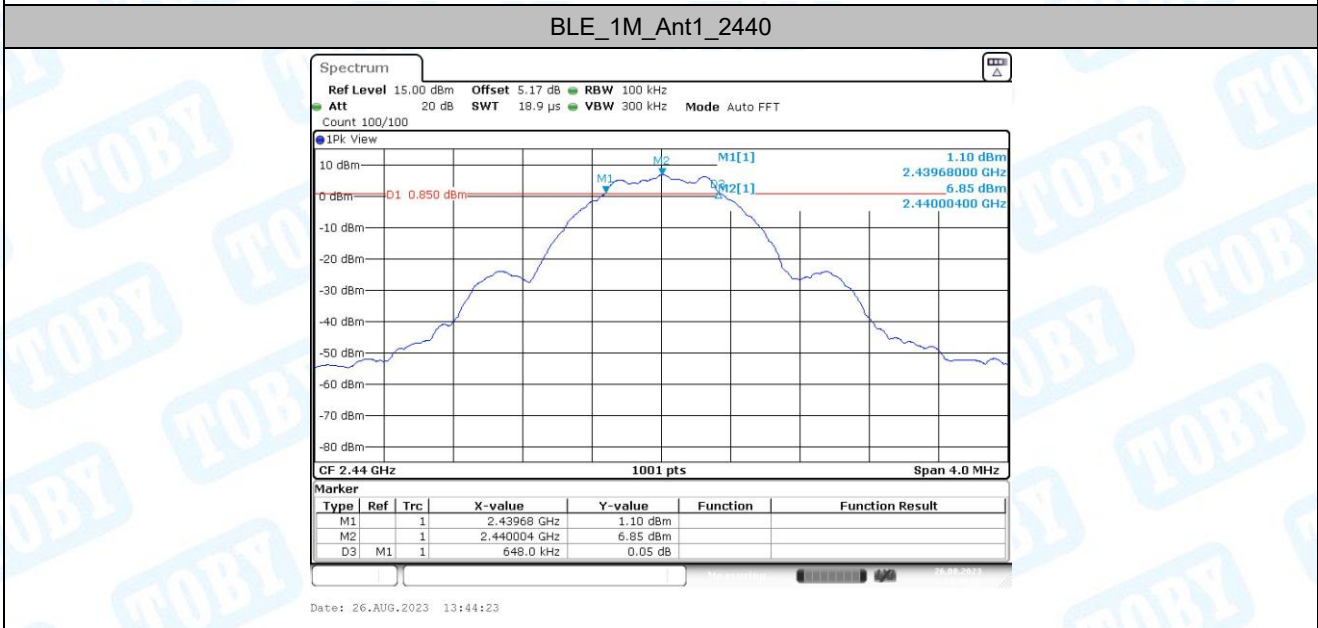
1. DTS Bandwidth

1.1. Test Result

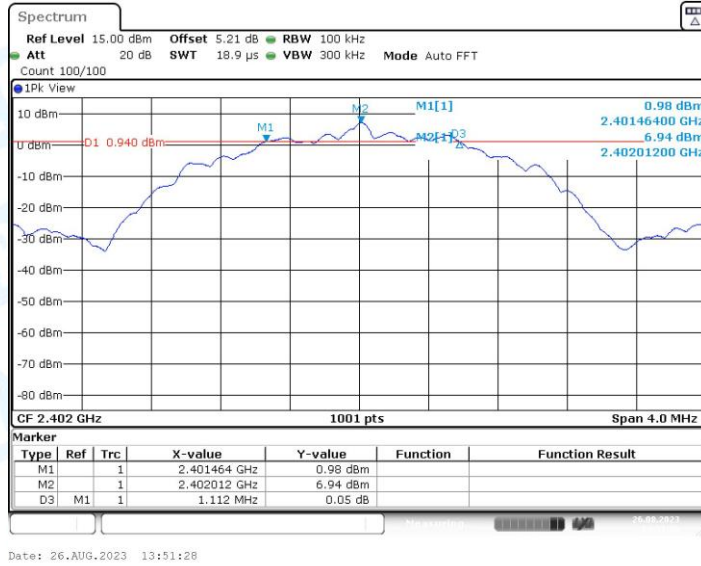
| Test Mode | Antenna | Channel | DTS BW [MHz] | FL[MHz] | FH[MHz] | Limit[MHz] | Verdict |
|-----------|---------|---------|--------------|---------|---------|------------|---------|
| BLE_1M | Ant1 | 2402 | 0.66 | 2401.67 | 2402.33 | 0.5 | PASS |
| | | 2440 | 0.65 | 2439.68 | 2440.33 | 0.5 | PASS |
| | | 2480 | 0.66 | 2479.67 | 2480.33 | 0.5 | PASS |
| BLE_2M | Ant1 | 2402 | 1.11 | 2401.46 | 2402.58 | 0.5 | PASS |
| | | 2440 | 1.12 | 2439.46 | 2440.58 | 0.5 | PASS |
| | | 2480 | 1.09 | 2479.46 | 2480.55 | 0.5 | PASS |

Note: Test data is kept to two decimal places only

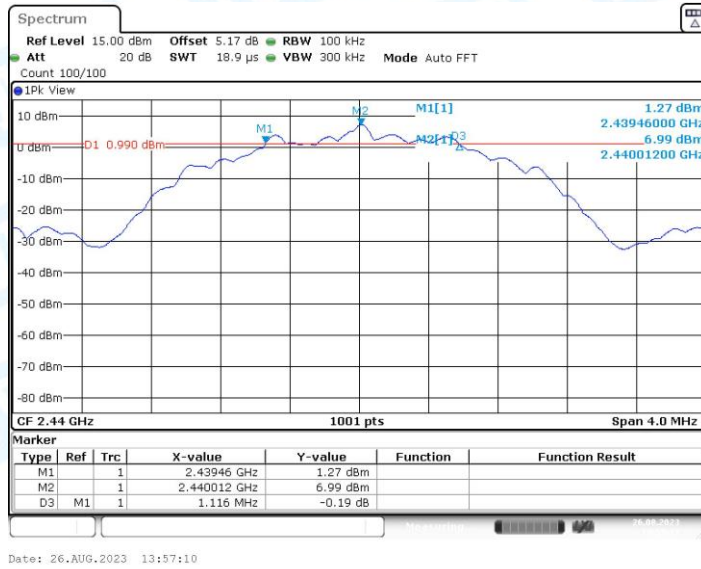
1.2. Test Graphs



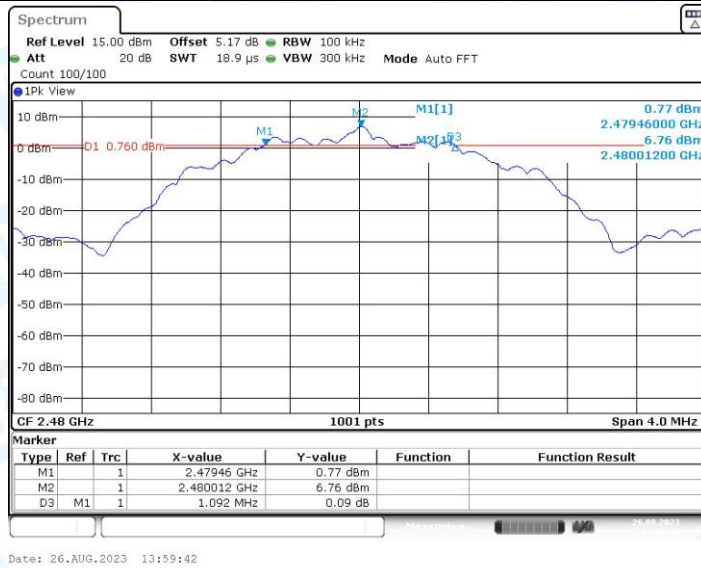
BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



BLE_2M_Ant1_2480

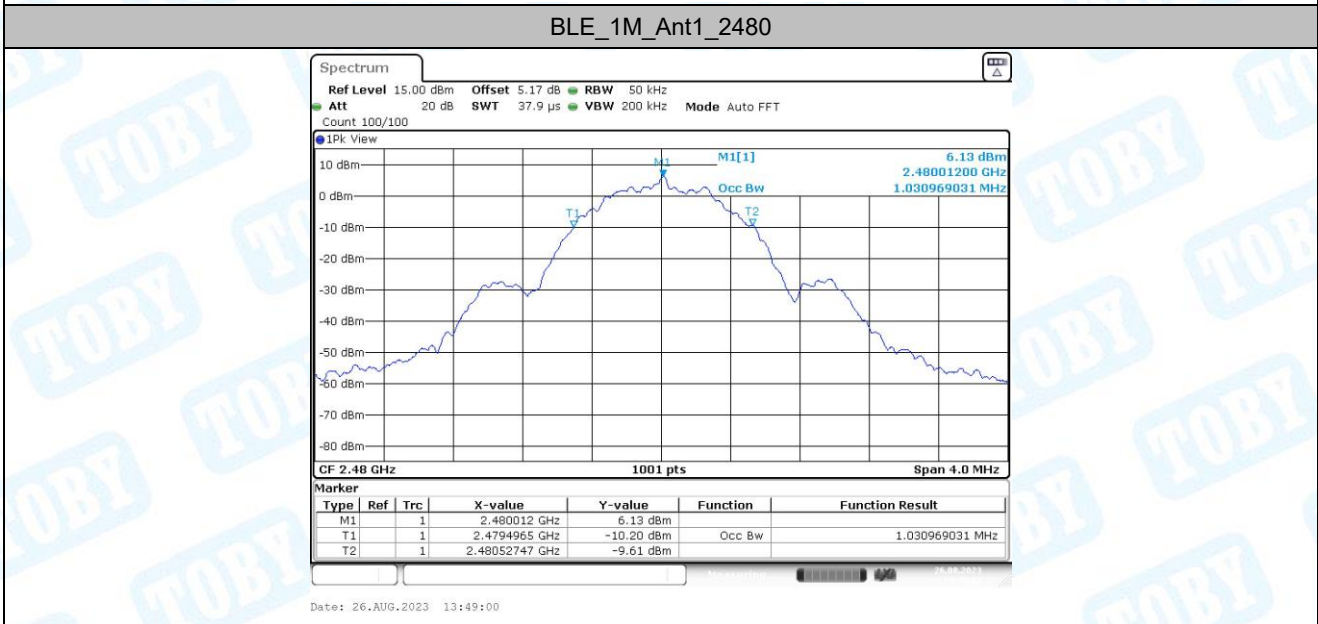
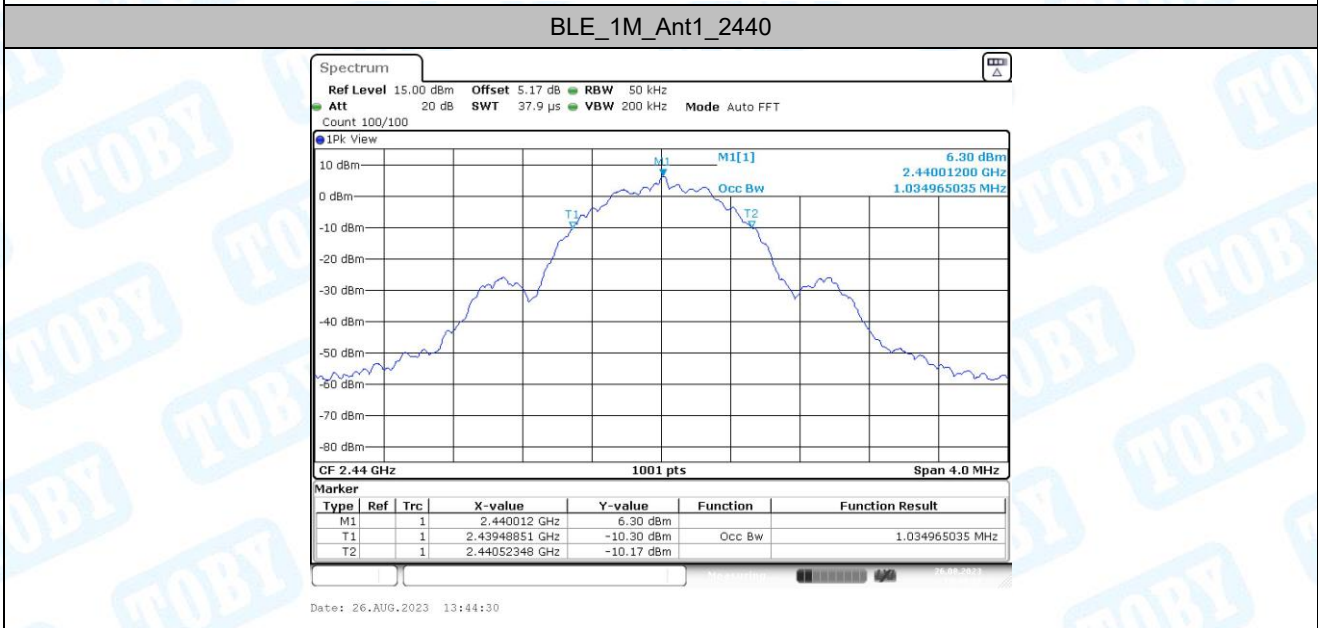
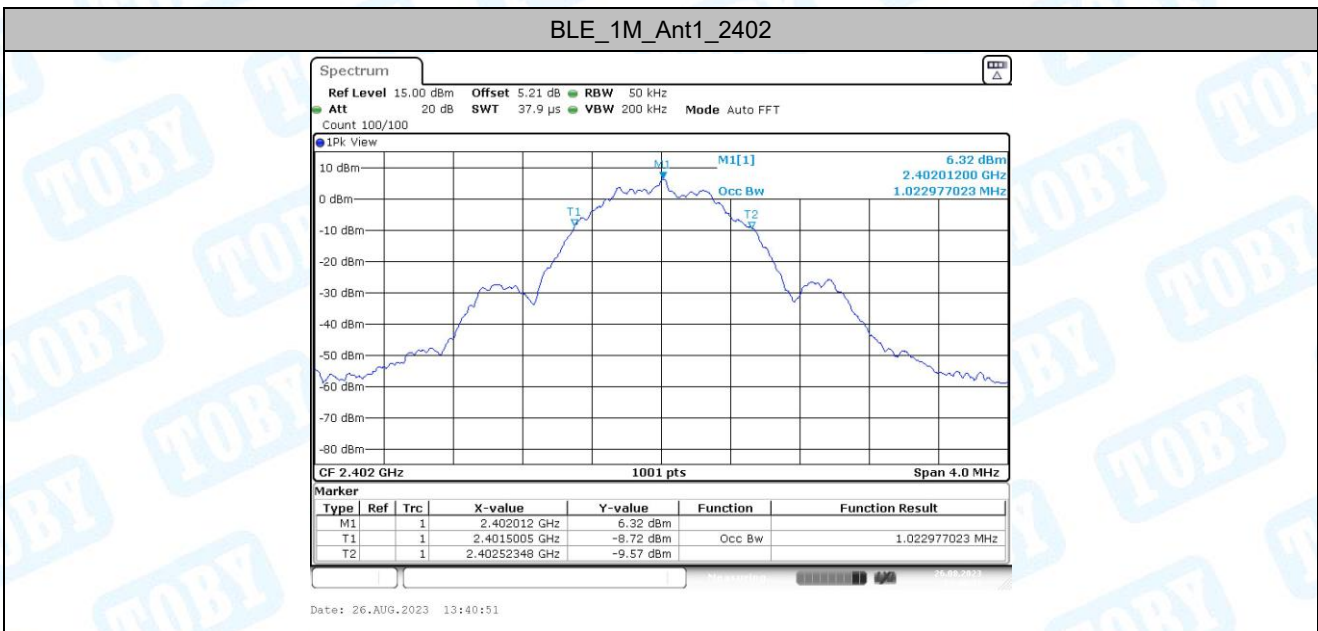


2. Occupied Channel Bandwidth

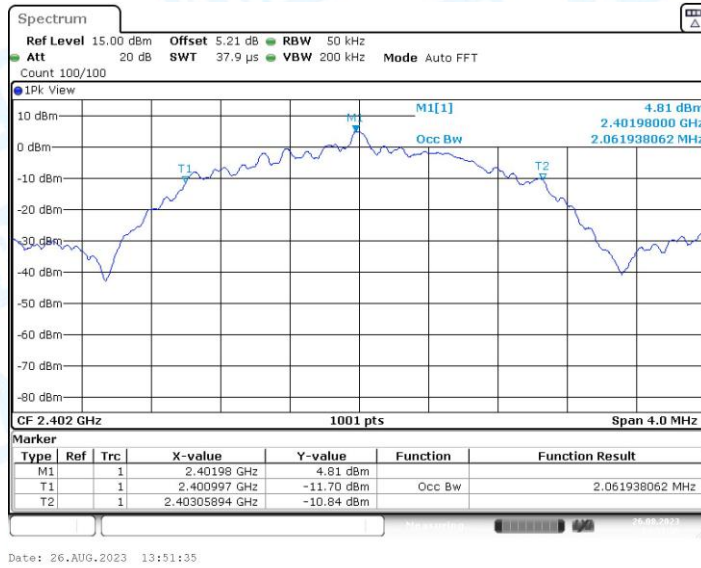
2.1. Test Result

| Test Mode | Antenna | Channel | OCB [MHz] | FL[MHz] | FH[MHz] | Limit[MHz] | Verdict |
|-----------|---------|---------|-----------|-----------|-----------|------------|---------|
| BLE_1M | Ant1 | 2402 | 1.023 | 2401.5005 | 2402.5235 | --- | --- |
| | | 2440 | 1.035 | 2439.4885 | 2440.5235 | --- | --- |
| | | 2480 | 1.031 | 2479.4965 | 2480.5275 | --- | --- |
| BLE_2M | Ant1 | 2402 | 2.062 | 2400.9970 | 2403.0589 | --- | --- |
| | | 2440 | 2.066 | 2438.9930 | 2441.0589 | --- | --- |
| | | 2480 | 2.058 | 2479.0010 | 2481.0589 | --- | --- |

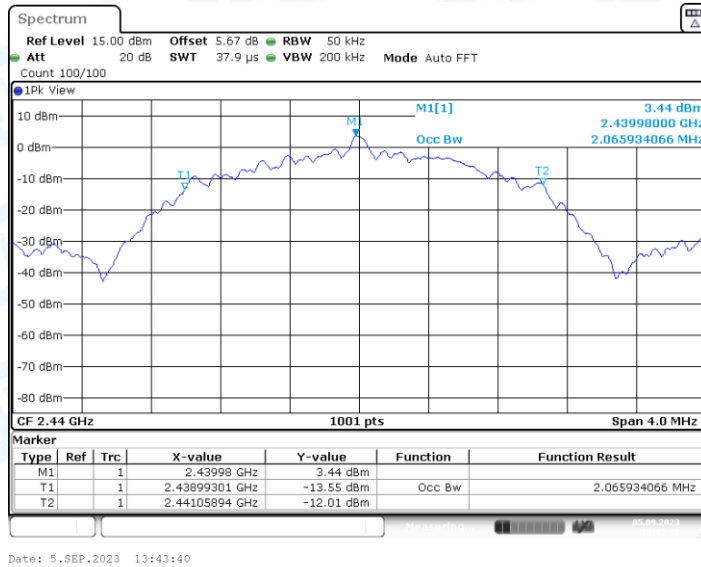
2.2. Test Graphs



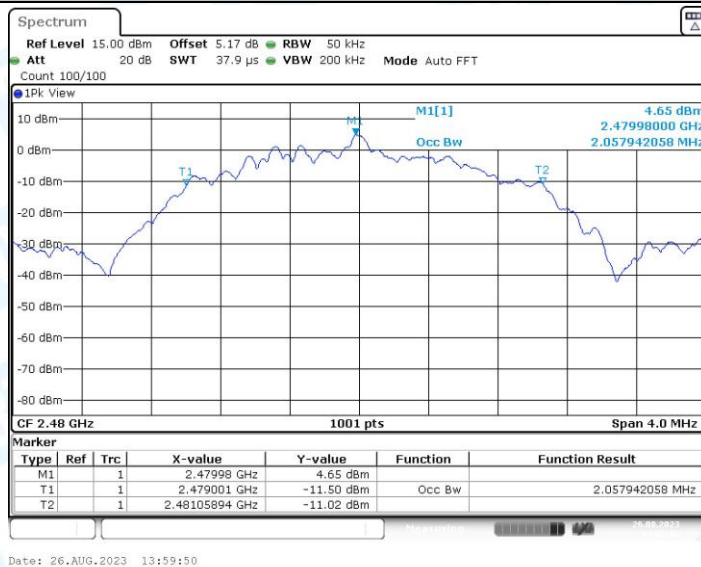
BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



BLE_2M_Ant1_2480

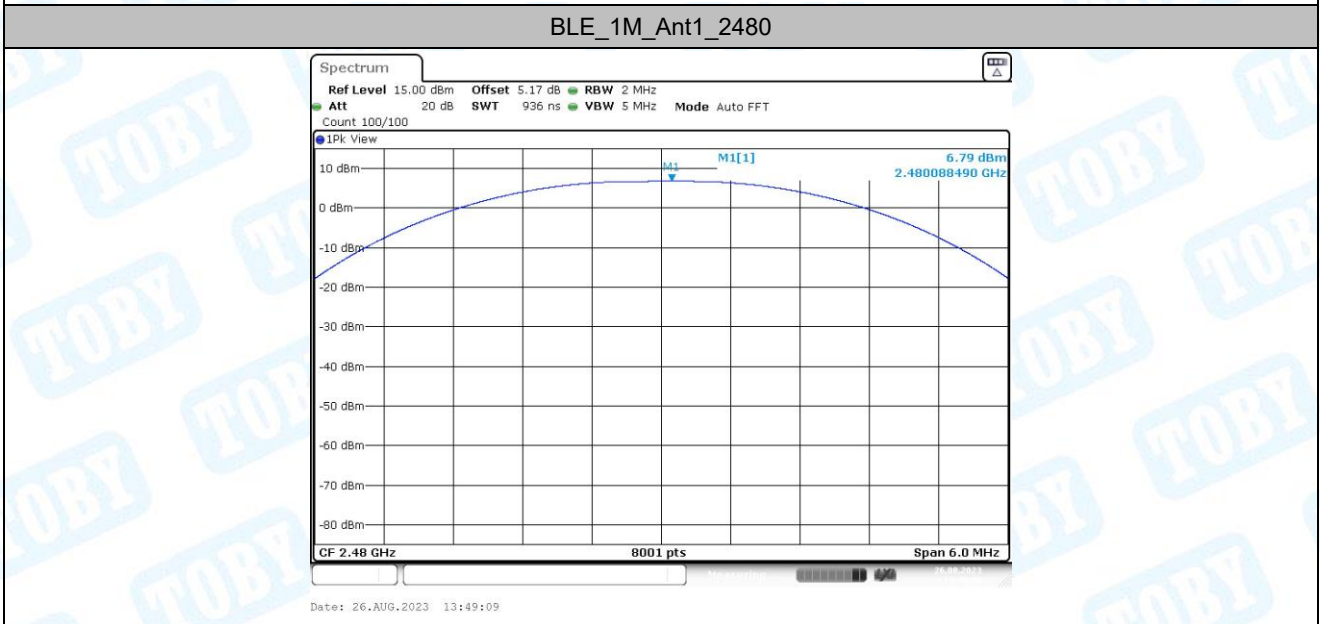


3. Maximum conducted output power

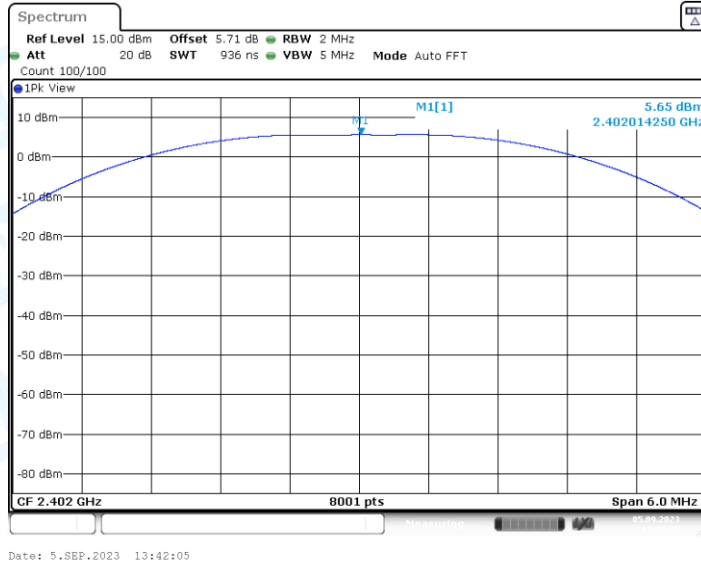
3.1. Test Result

| Test Mode | Antenna | Channel | Result[dBm] | Limit[dBm] | Verdict |
|-----------|---------|---------|-------------|------------|---------|
| BLE_1M | Ant1 | 2402 | 7.01 | ≤30 | PASS |
| | | 2440 | 7.00 | ≤30 | PASS |
| | | 2480 | 6.79 | ≤30 | PASS |
| BLE_2M | Ant1 | 2402 | 5.65 | ≤30 | PASS |
| | | 2440 | 5.68 | ≤30 | PASS |
| | | 2480 | 5.55 | ≤30 | PASS |

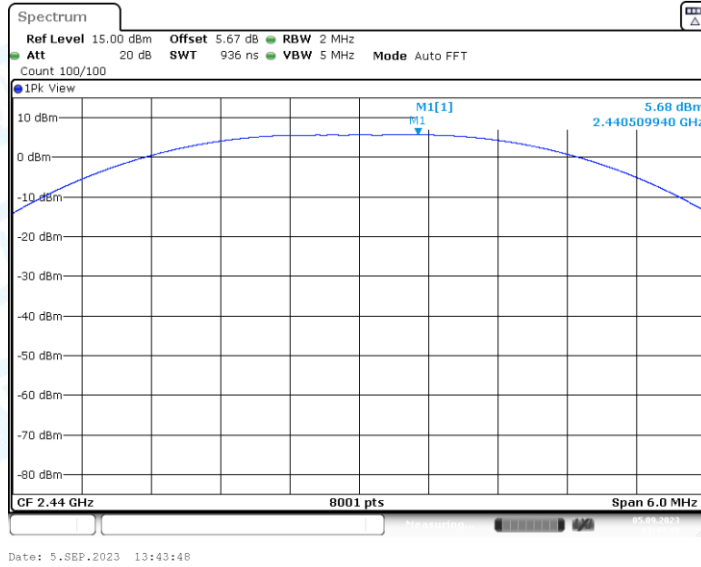
3.2. Test Graphs



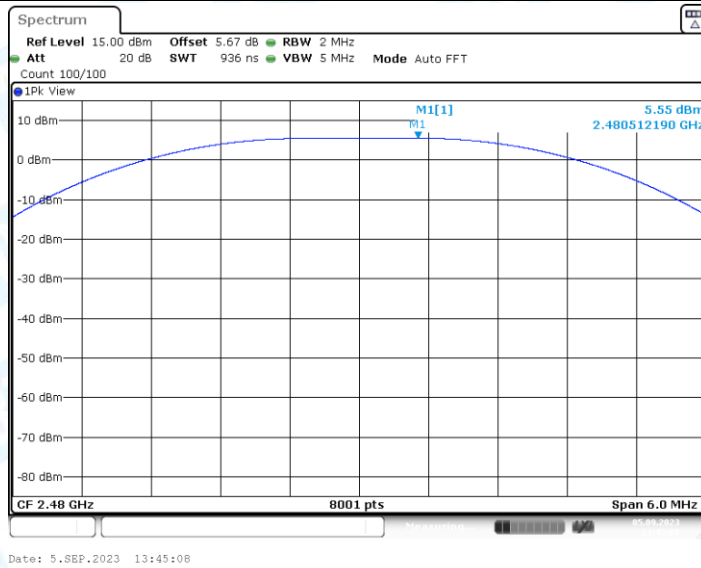
BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



BLE_2M_Ant1_2480

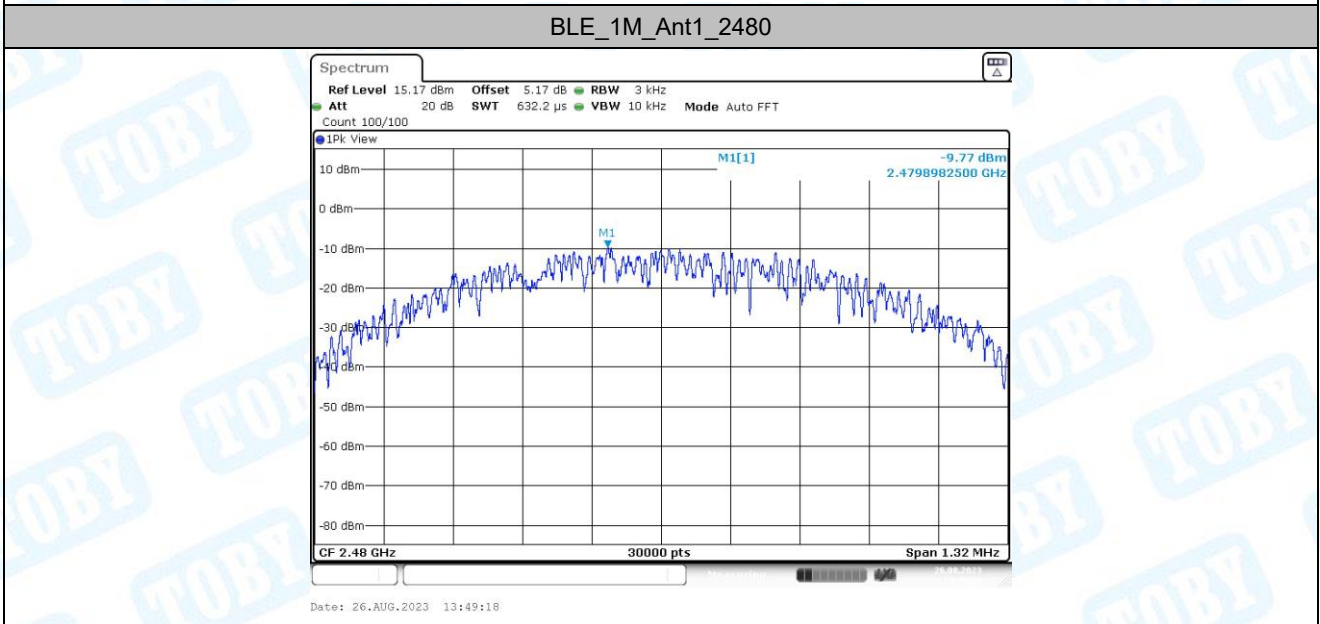
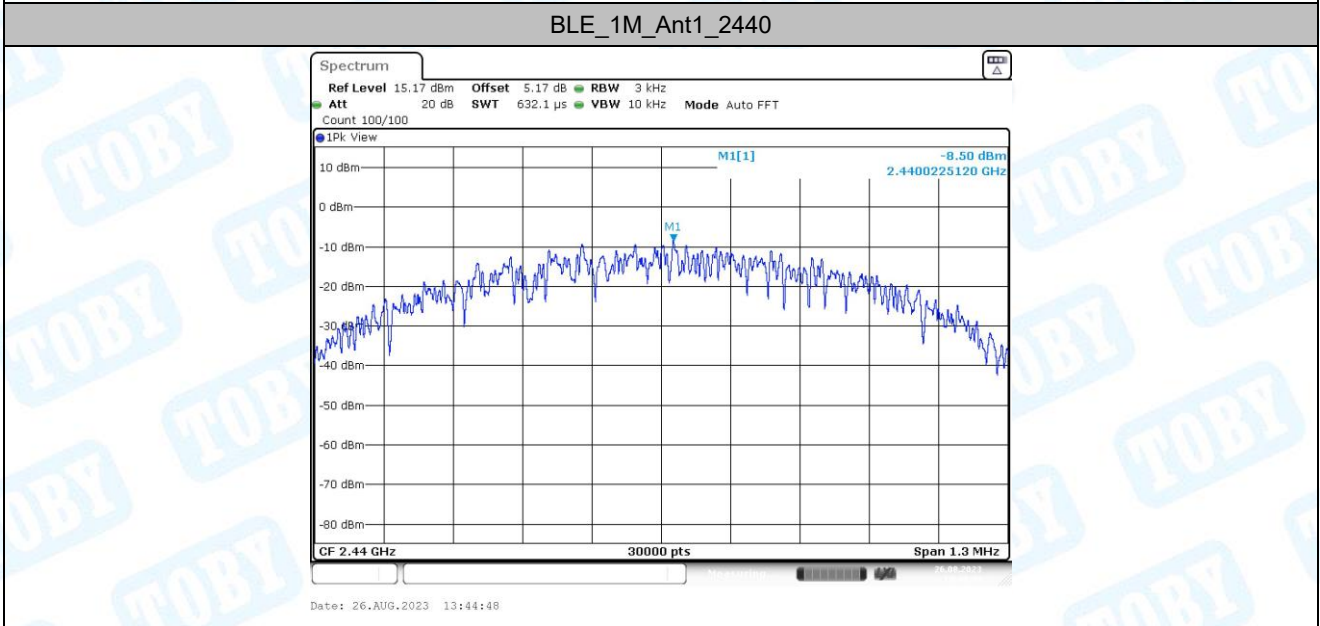
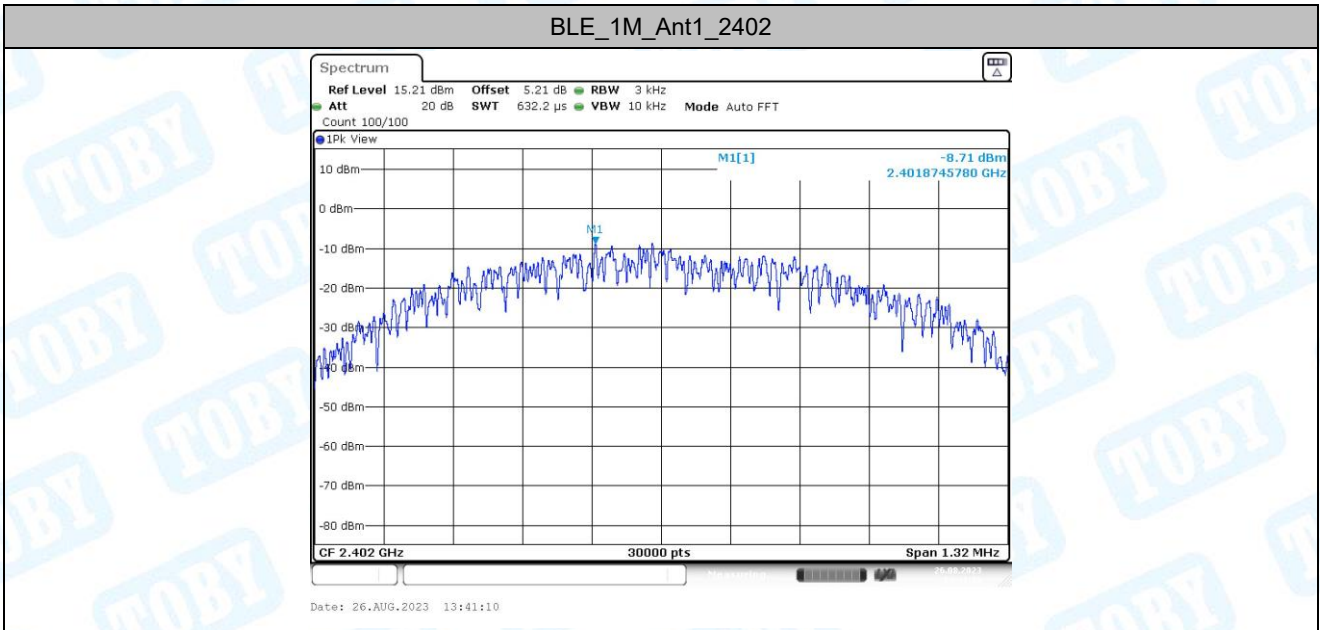


4. Maximum power spectral density

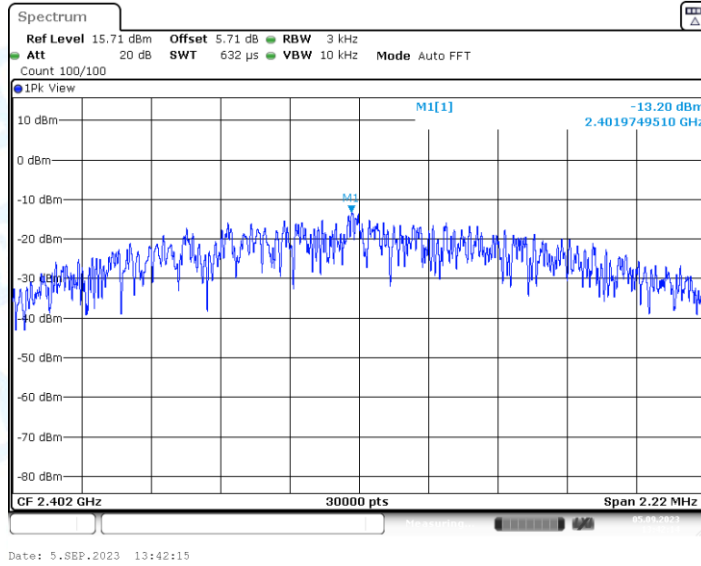
4.1. Test Result

| Test Mode | Antenna | Channel | Result[dBm/3kHz] | Limit[dBm/3kHz] | Verdict |
|-----------|---------|---------|------------------|-----------------|---------|
| BLE_1M | Ant1 | 2402 | -8.71 | ≤8.00 | PASS |
| | | 2440 | -8.50 | ≤8.00 | PASS |
| | | 2480 | -9.77 | ≤8.00 | PASS |
| BLE_2M | Ant1 | 2402 | -13.20 | ≤8.00 | PASS |
| | | 2440 | -12.83 | ≤8.00 | PASS |
| | | 2480 | -13.11 | ≤8.00 | PASS |

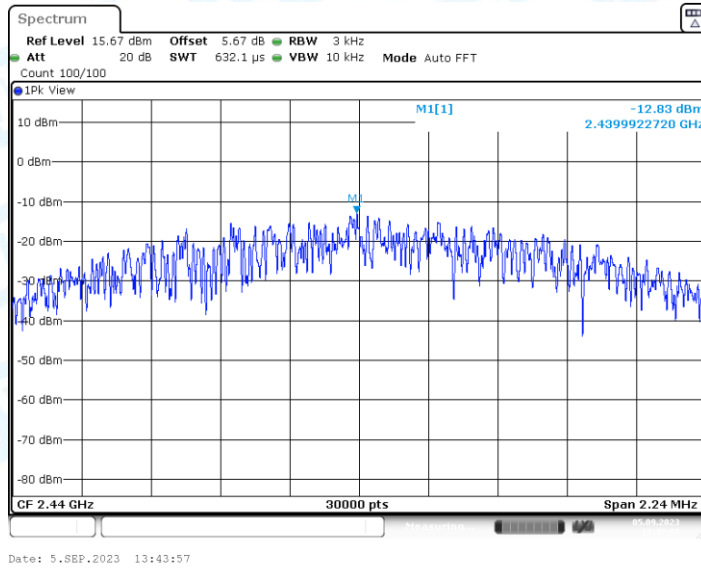
4.2. Test Graphs



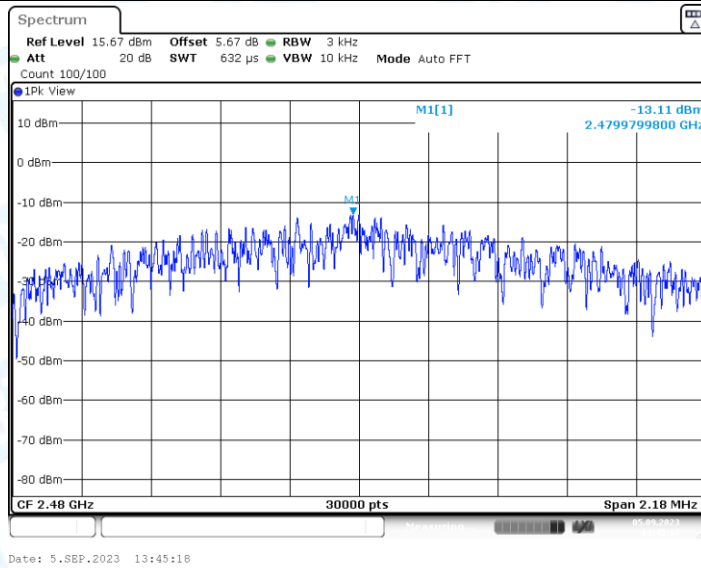
BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



BLE_2M_Ant1_2480

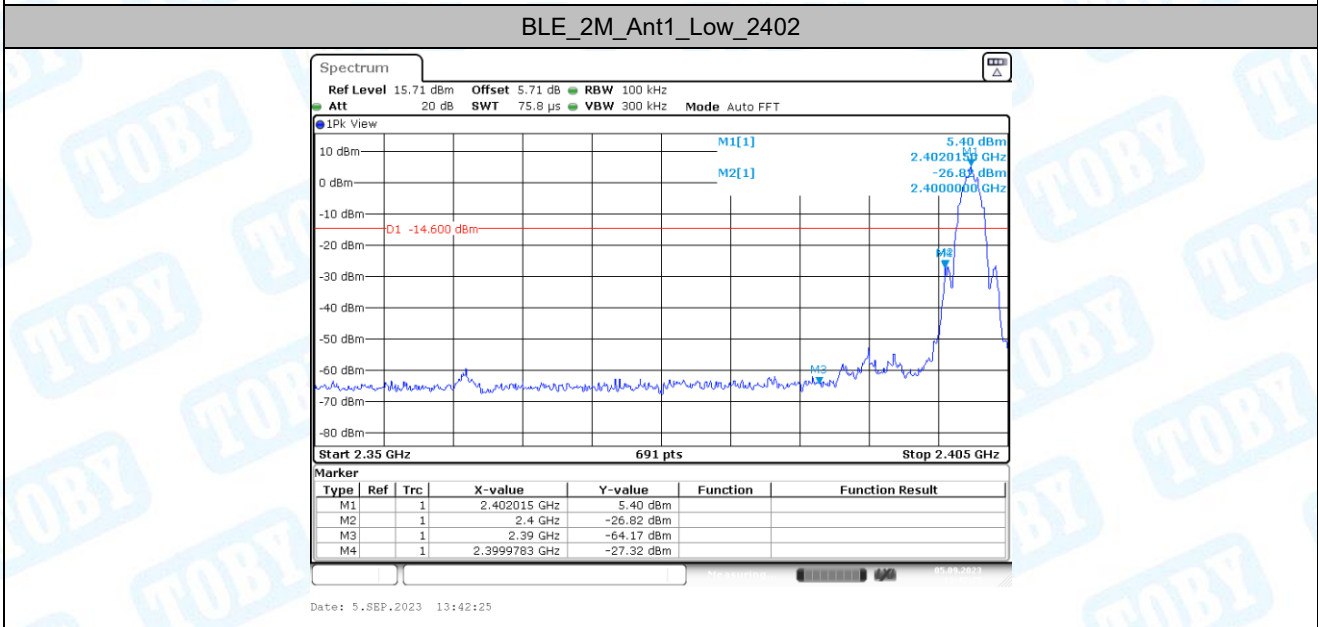
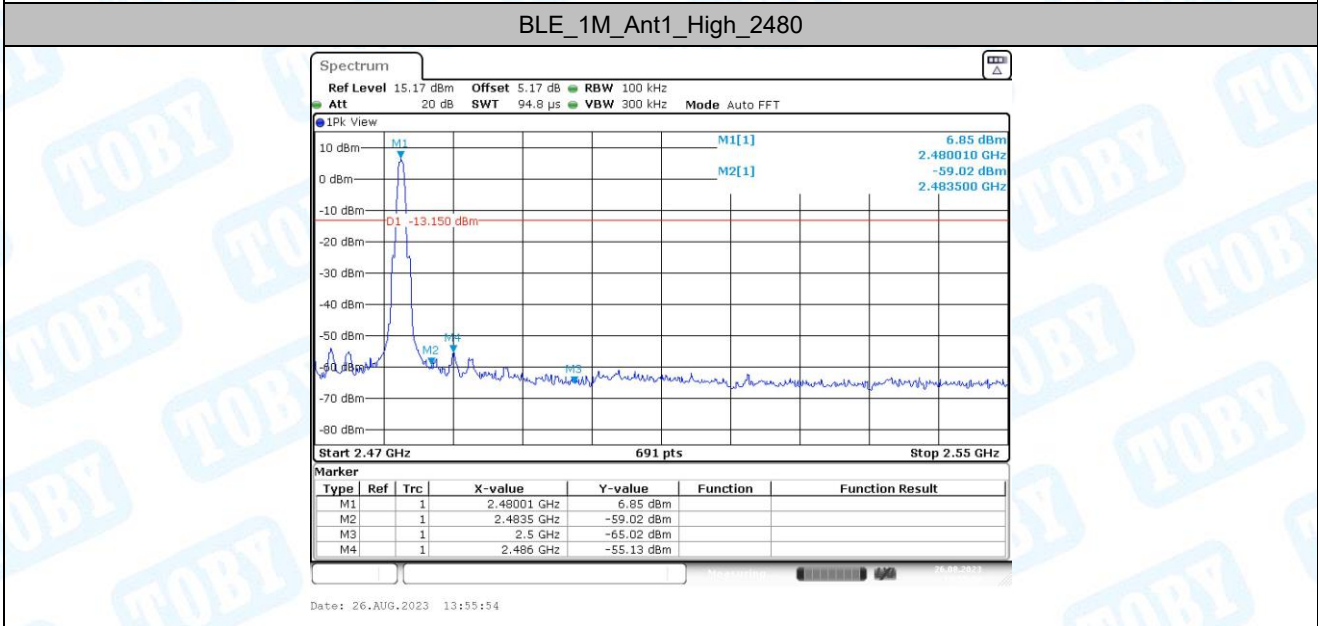
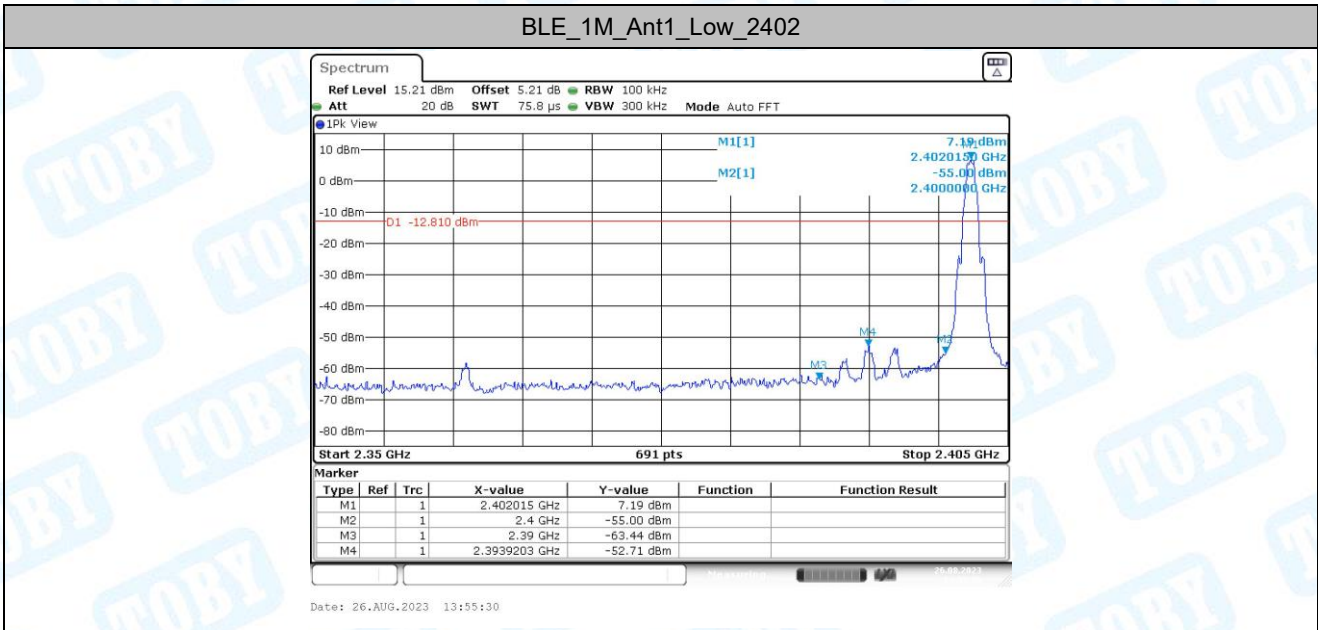


5. Band edge measurements

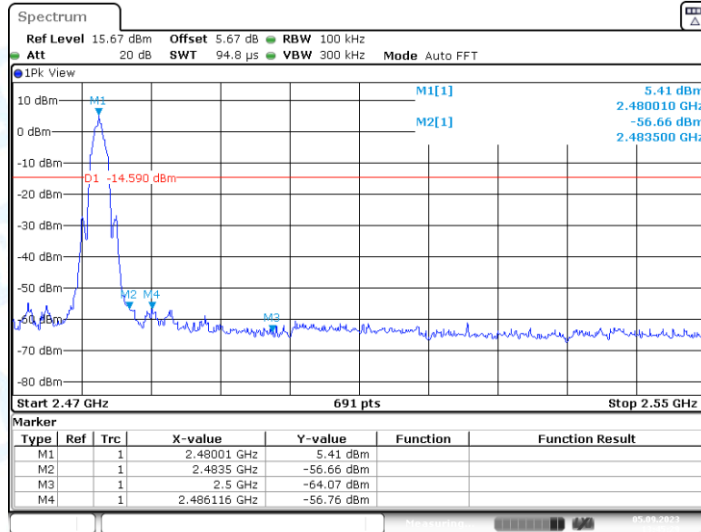
5.1. Test Result

| Test Mode | Antenna | ChName | Channel | Ref.Level[dBm] | Result[dBm] | Limit[dBm] | Verdict |
|-----------|---------|--------|---------|----------------|-------------|------------|---------|
| BLE_1M | Ant1 | Low | 2402 | 7.19 | -52.71 | ≤-12.81 | PASS |
| | | High | 2480 | 6.85 | -55.13 | ≤-13.15 | PASS |
| BLE_2M | Ant1 | Low | 2402 | 5.40 | -27.32 | ≤-14.6 | PASS |
| | | High | 2480 | 5.41 | -56.76 | ≤-14.59 | PASS |

5.2. Test Graphs



BLE_2M_Ant1_High_2480



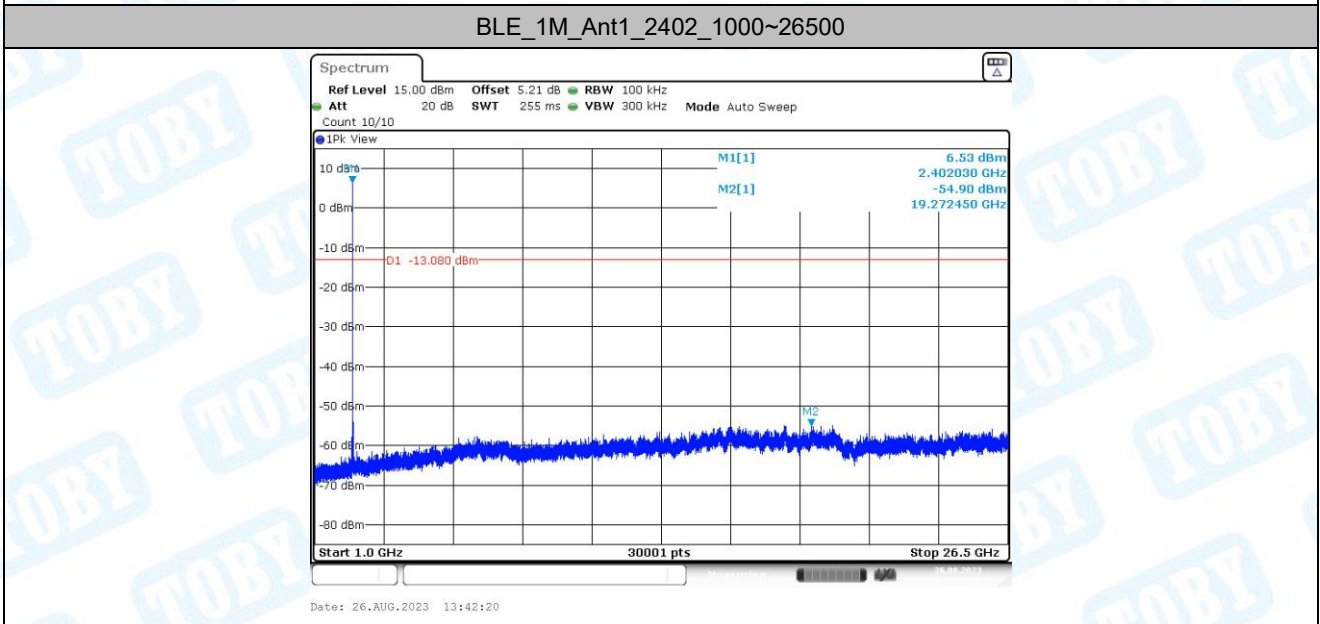
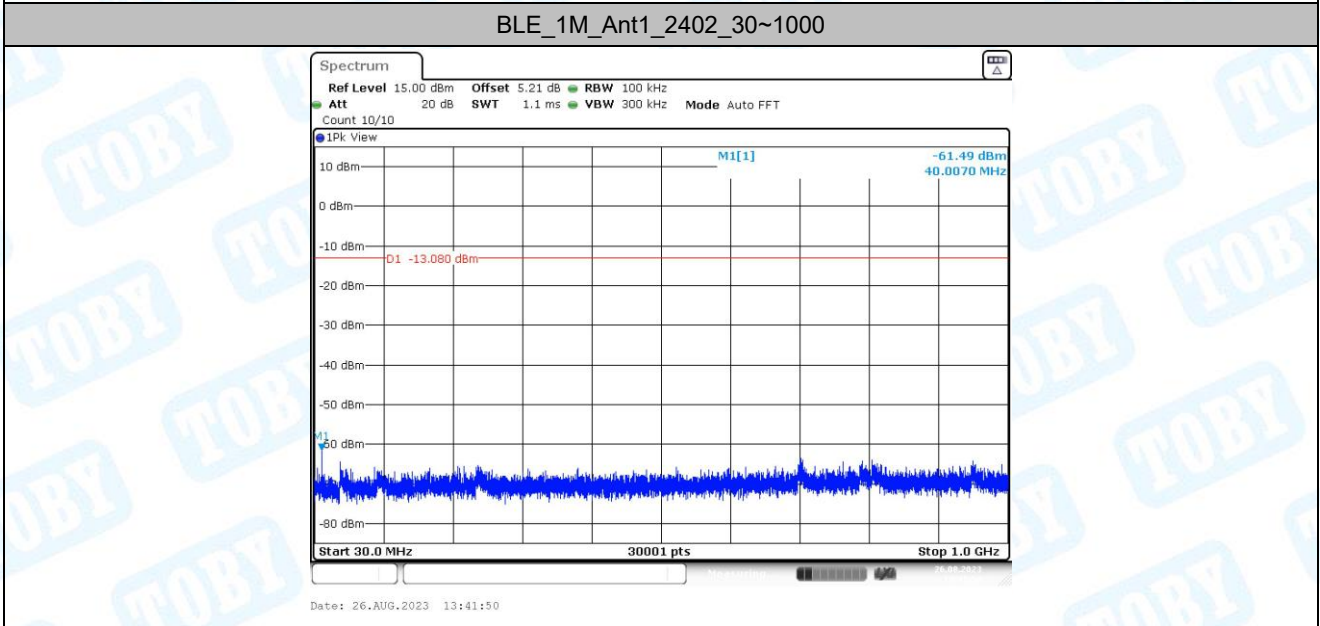
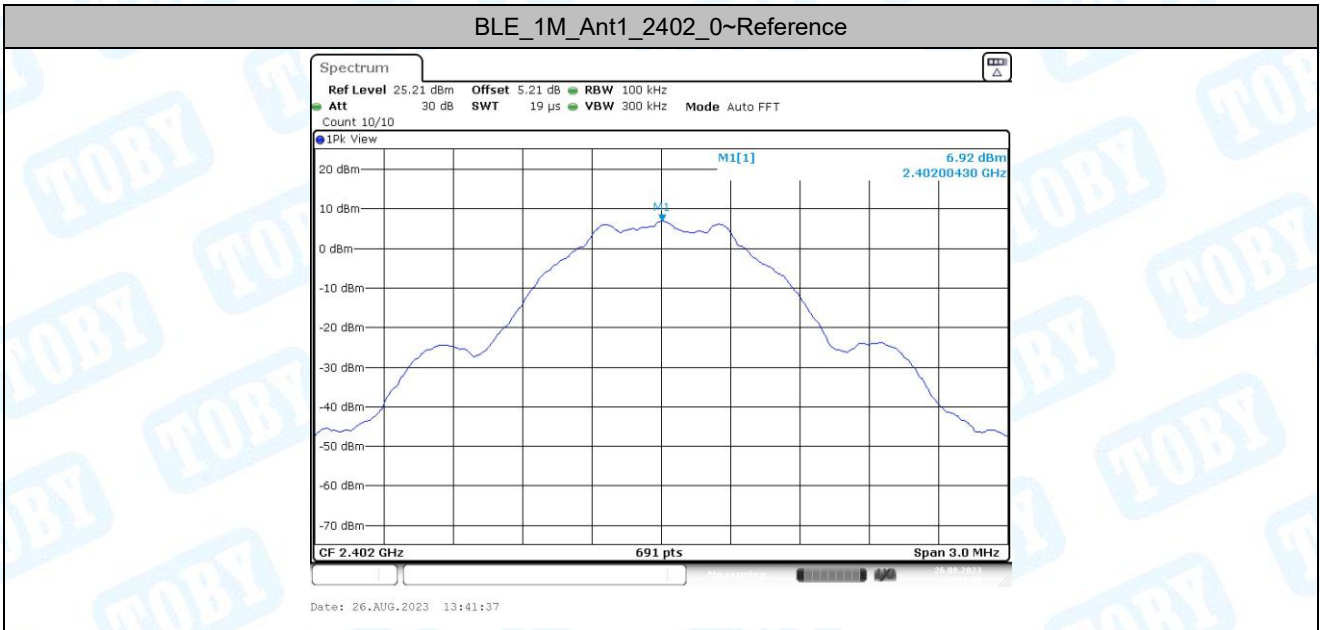
Date: 5.SEP.2023 13:45:28

6. Conducted Spurious Emission

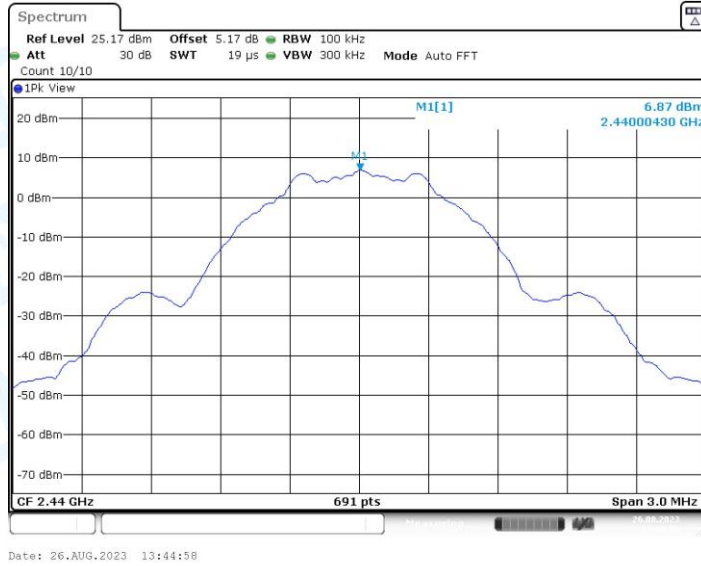
6.1. Test Result

| Test Mode | Antenna | Channel | Freq. Range [MHz] | Ref. Level [dBm] | Result[dBm] | Limit[dBm] | Verdict |
|-----------|---------|---------|-------------------|------------------|-------------|------------|---------|
| BLE_1M | Ant1 | 2402 | Reference | 6.92 | 6.92 | --- | PASS |
| | | | 30~1000 | 6.92 | -61.49 | ≤-13.08 | PASS |
| | | | 1000~26500 | 6.92 | -54.9 | ≤-13.08 | PASS |
| | | 2440 | Reference | 6.87 | 6.87 | --- | PASS |
| | | | 30~1000 | 6.87 | -61.86 | ≤-13.13 | PASS |
| | | | 1000~26500 | 6.87 | -54.55 | ≤-13.13 | PASS |
| | | 2480 | Reference | 6.63 | 6.63 | --- | PASS |
| | | | 30~1000 | 6.63 | -61.94 | ≤-13.37 | PASS |
| | | | 1000~26500 | 6.63 | -54.62 | ≤-13.37 | PASS |
| BLE_2M | Ant1 | 2402 | Reference | 5.54 | 5.54 | --- | PASS |
| | | | 30~1000 | 5.54 | -61.06 | ≤-14.46 | PASS |
| | | | 1000~26500 | 5.54 | -54.34 | ≤-14.46 | PASS |
| | | 2440 | Reference | 5.54 | 5.54 | --- | PASS |
| | | | 30~1000 | 5.54 | -61.4 | ≤-14.46 | PASS |
| | | | 1000~26500 | 5.54 | -54.69 | ≤-14.46 | PASS |
| | | 2480 | Reference | 5.40 | 5.40 | --- | PASS |
| | | | 30~1000 | 5.40 | -60.79 | ≤-14.6 | PASS |
| | | | 1000~26500 | 5.40 | -54.45 | ≤-14.6 | PASS |

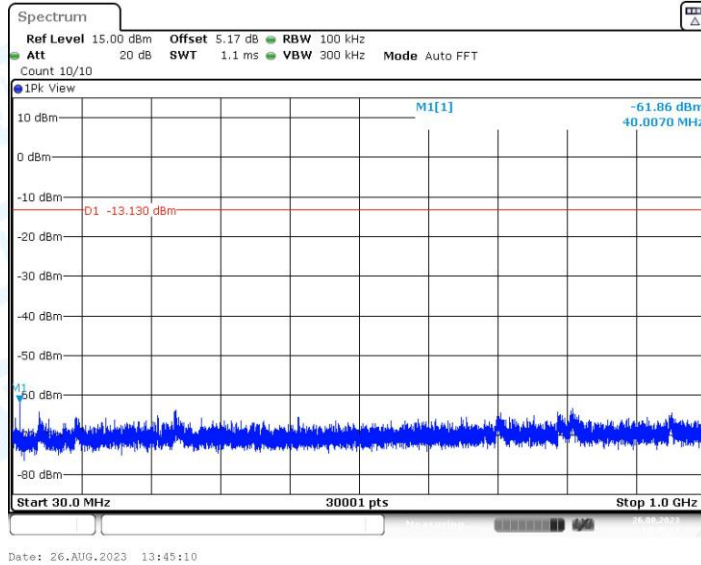
6.2. Test Graphs



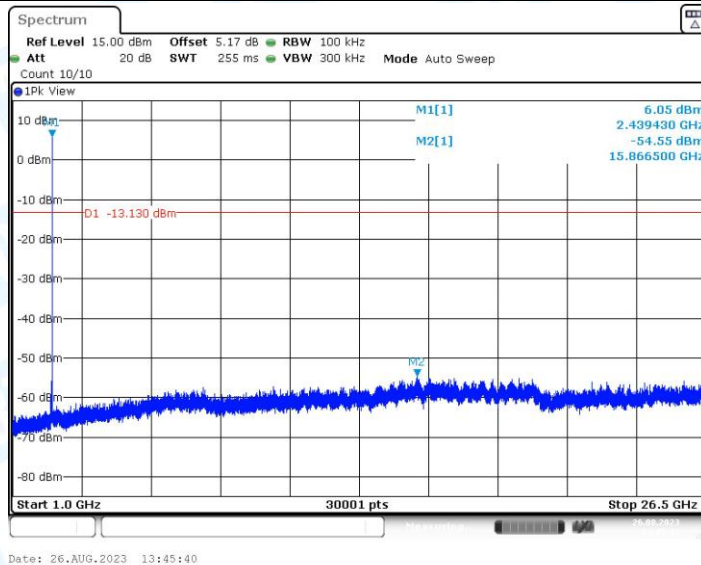
BLE_1M_Ant1_2440_0~Reference



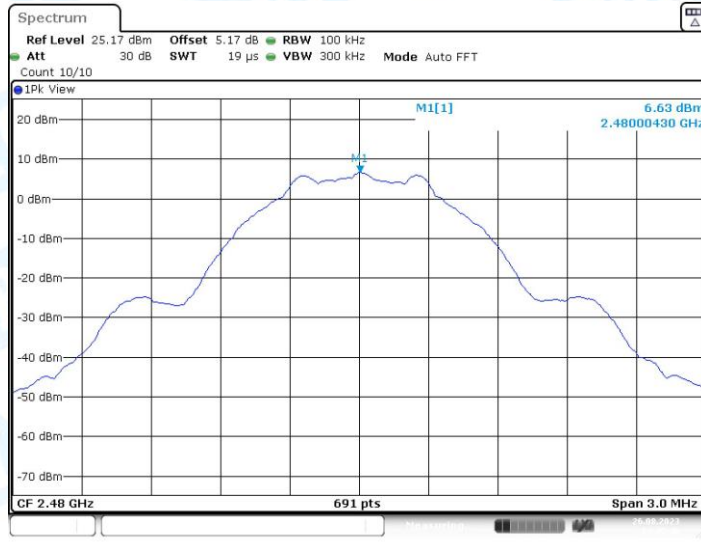
BLE_1M_Ant1_2440_30~1000



BLE_1M_Ant1_2440_1000~26500

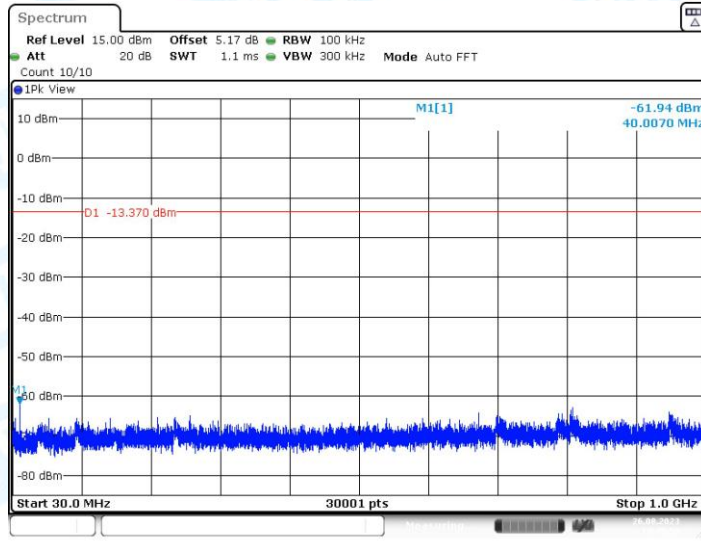


BLE_1M_Ant1_2480_0~Reference



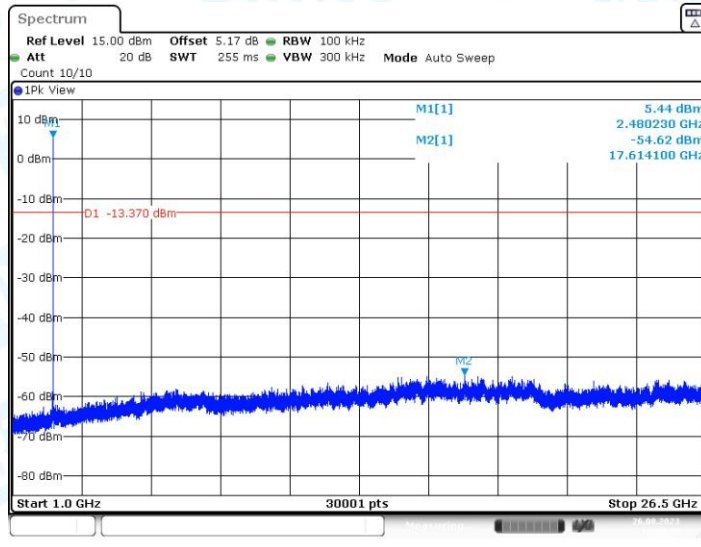
Date: 26.AUG.2023 13:49:46

BLE_1M_Ant1_2480_30~1000



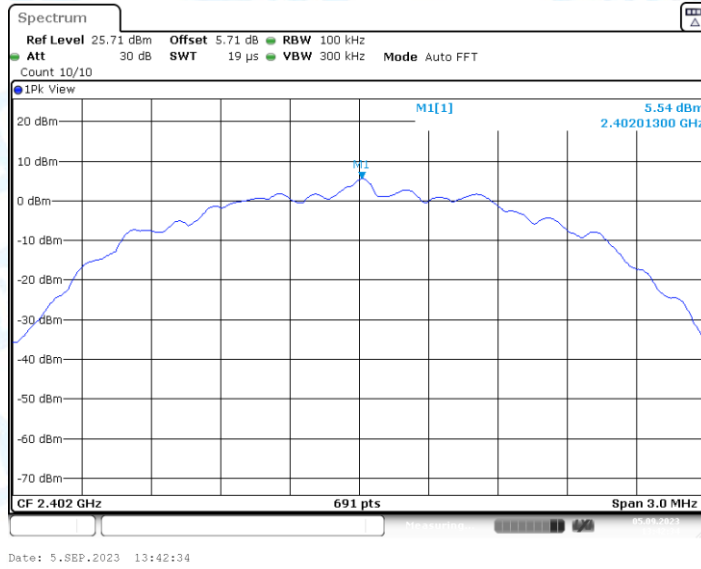
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BLE_1M_Ant1_2480_1000~26500

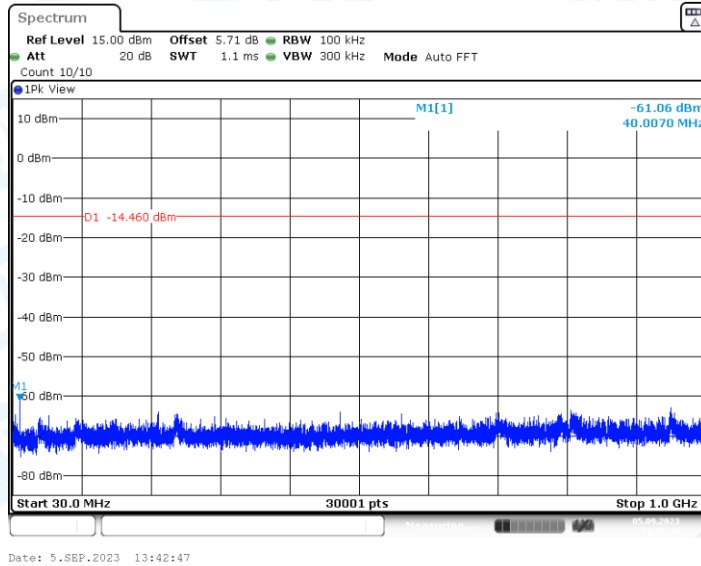


Date: 26.AUG.2023 13:50:29

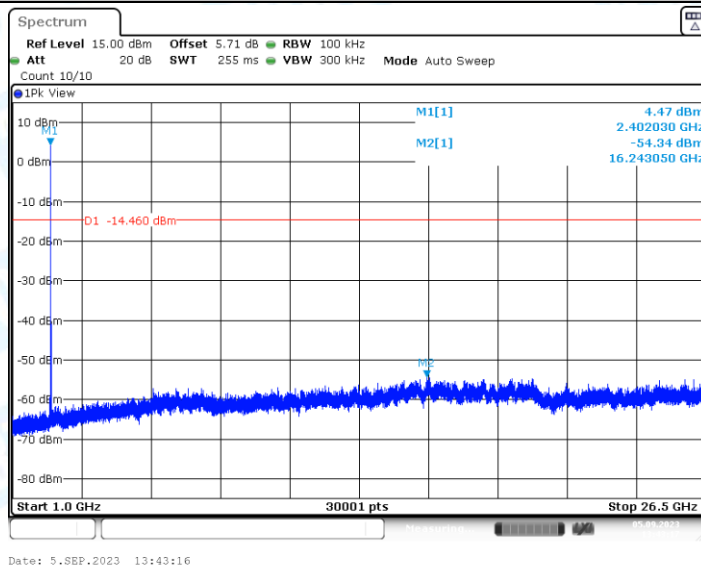
BLE_2M_Ant1_2402_0~Reference



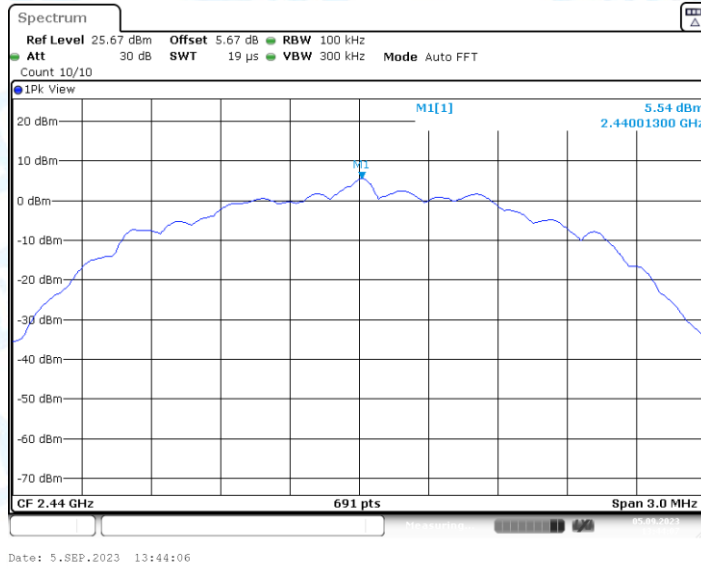
BLE_2M_Ant1_2402_30~1000



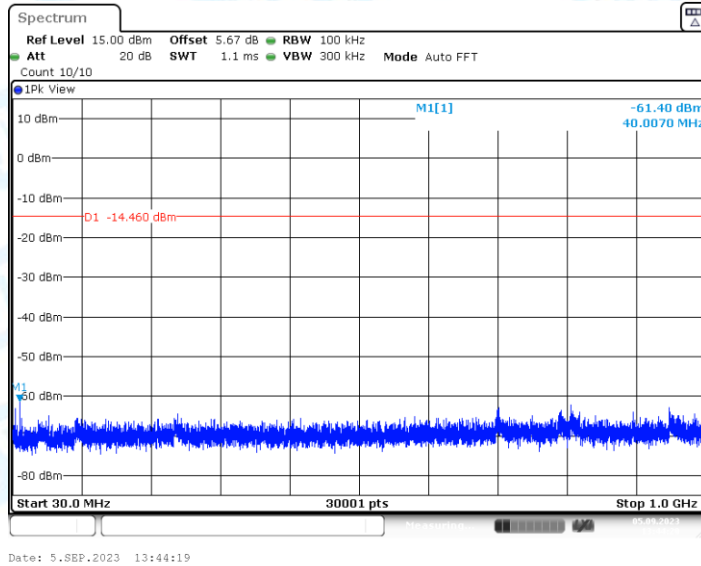
BLE_2M_Ant1_2402_1000~26500



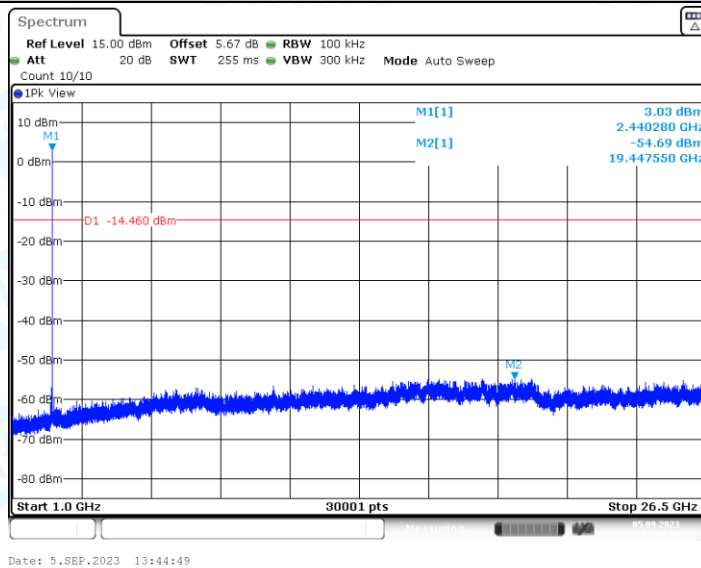
BLE_2M_Ant1_2440_0~Reference



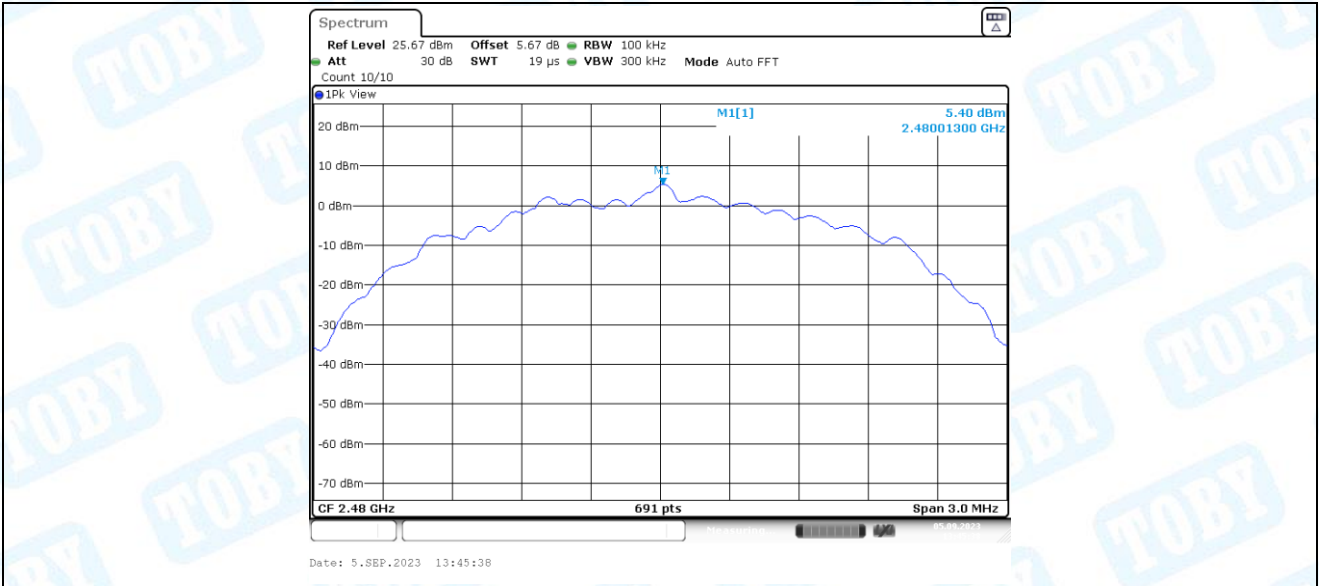
BLE_2M_Ant1_2440_30~1000



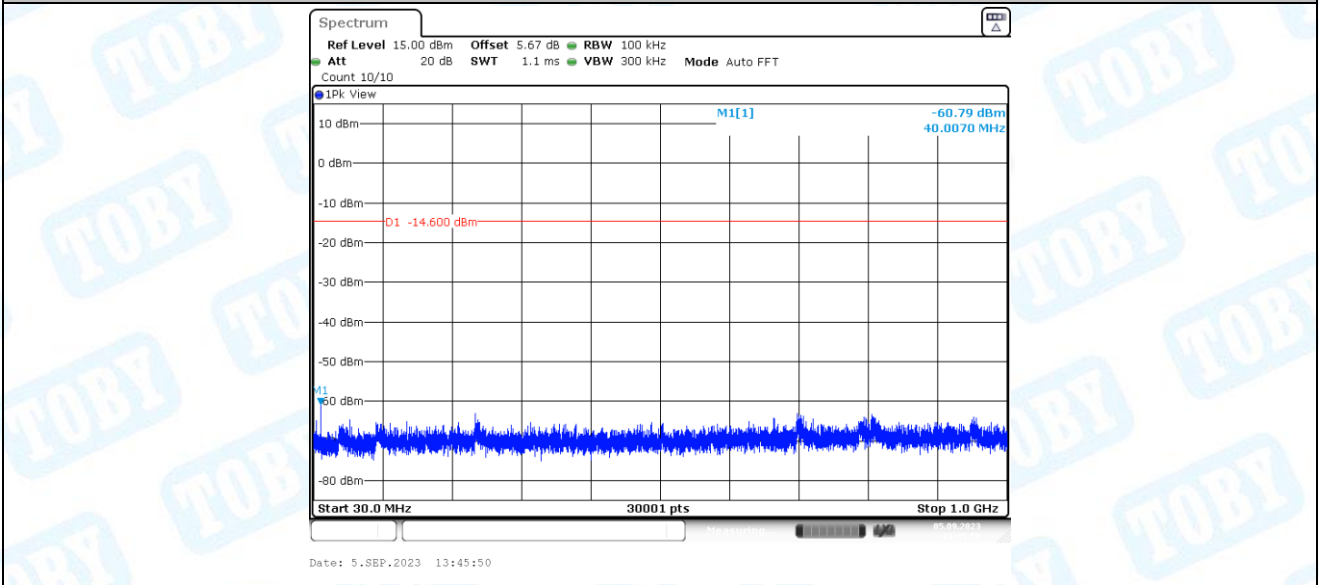
BLE_2M_Ant1_2440_1000~26500



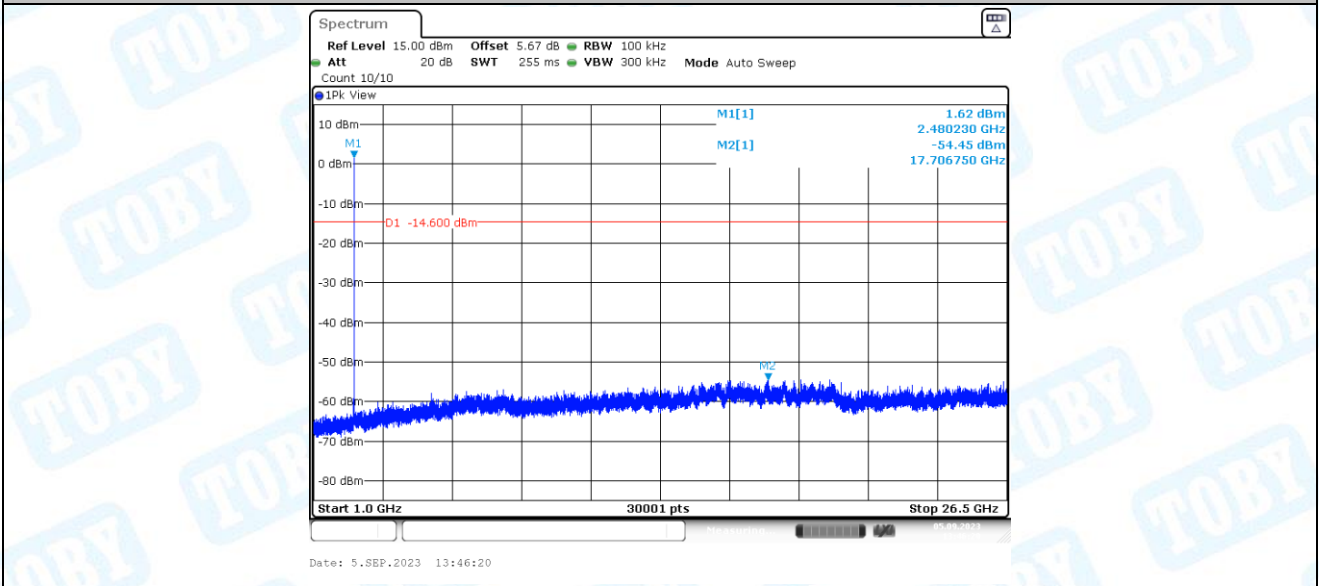
BLE_2M_Ant1_2480_0~Reference



BLE_2M_Ant1_2480_30~1000



BLE_2M_Ant1_2480_1000~26500

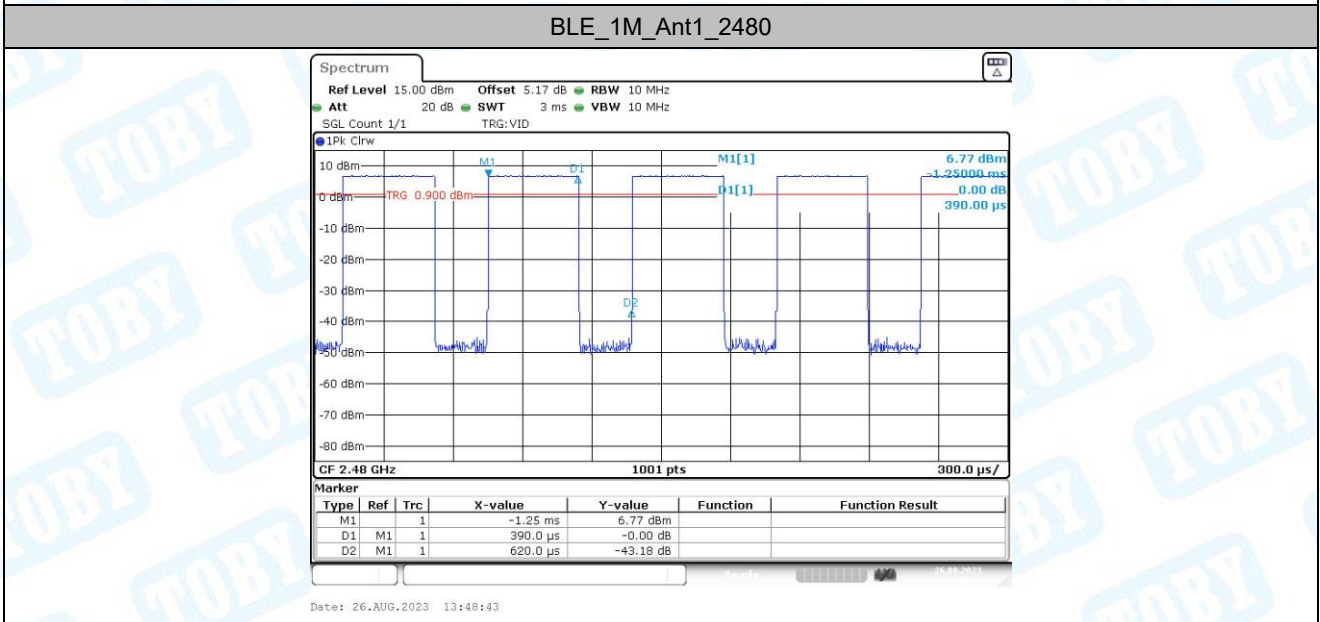
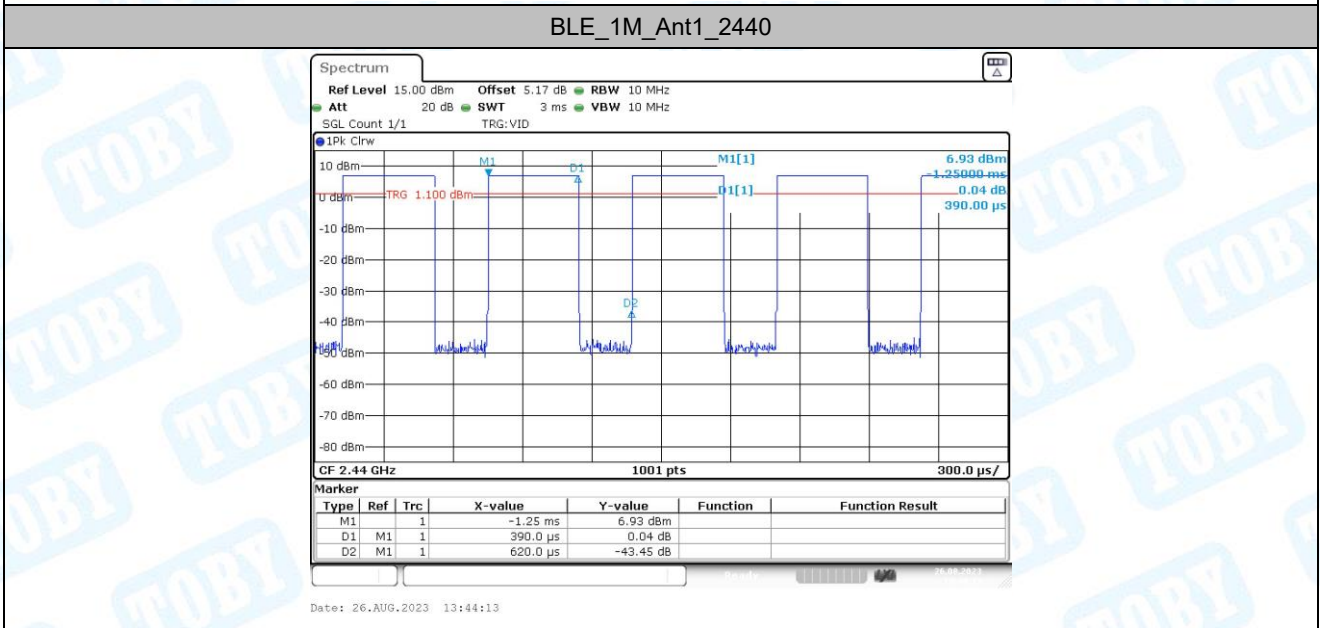
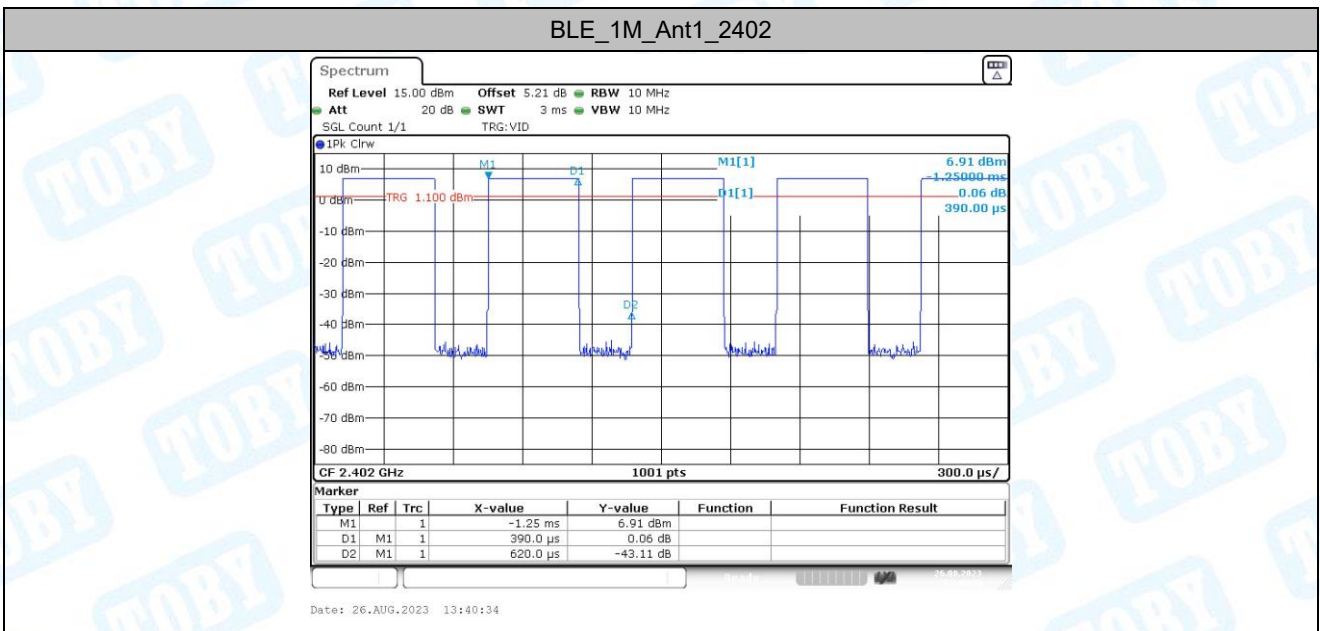


7. Duty Cycle

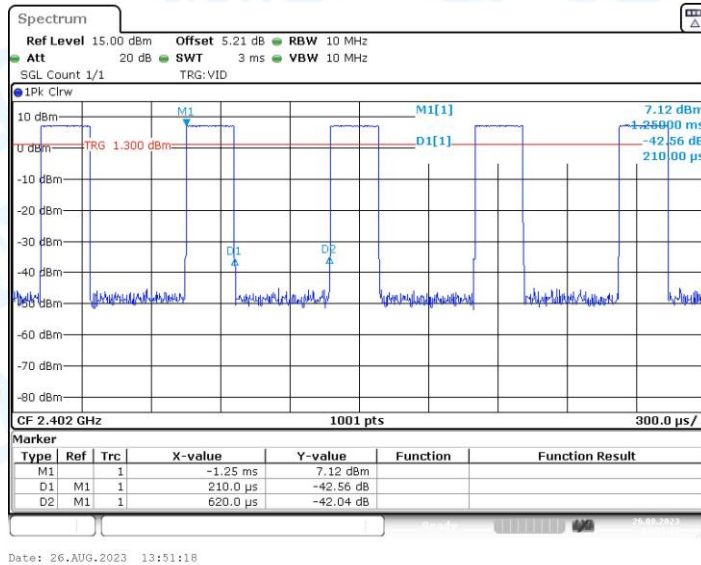
7.1. Test Result

| Test Mode | Antenna | Channel | Transmission Duration [ms] | Transmission Period [ms] | Duty Cycle [%] | 1/T [kHz] | Limit | Verdict |
|-----------|---------|---------|----------------------------|--------------------------|----------------|-----------|-------|---------|
| BLE_1M | Ant1 | 2402 | 0.39 | 0.62 | 62.90 | 2.56 | --- | --- |
| | | 2440 | 0.39 | 0.62 | 62.90 | 2.56 | --- | --- |
| | | 2480 | 0.39 | 0.62 | 62.90 | 2.56 | --- | --- |
| BLE_2M | Ant1 | 2402 | 0.21 | 0.62 | 33.87 | 4.76 | --- | --- |
| | | 2440 | 0.21 | 0.62 | 33.87 | 4.76 | --- | --- |
| | | 2480 | 0.21 | 0.62 | 33.87 | 4.76 | --- | --- |

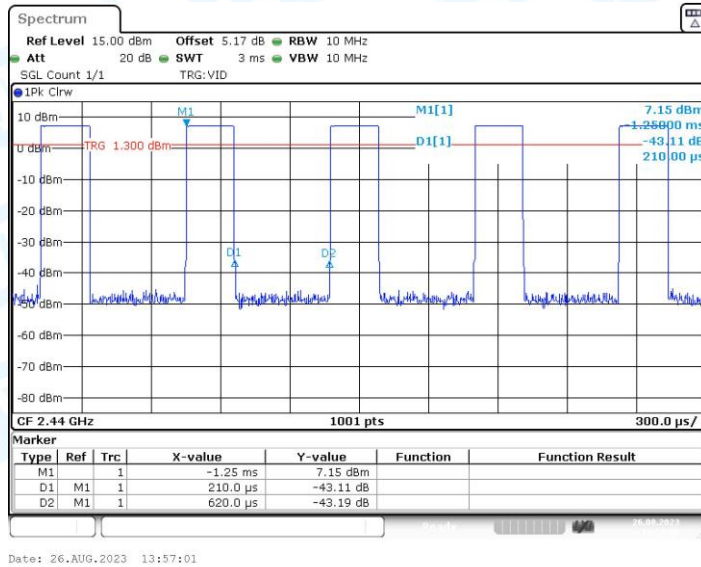
7.2. Test Graphs



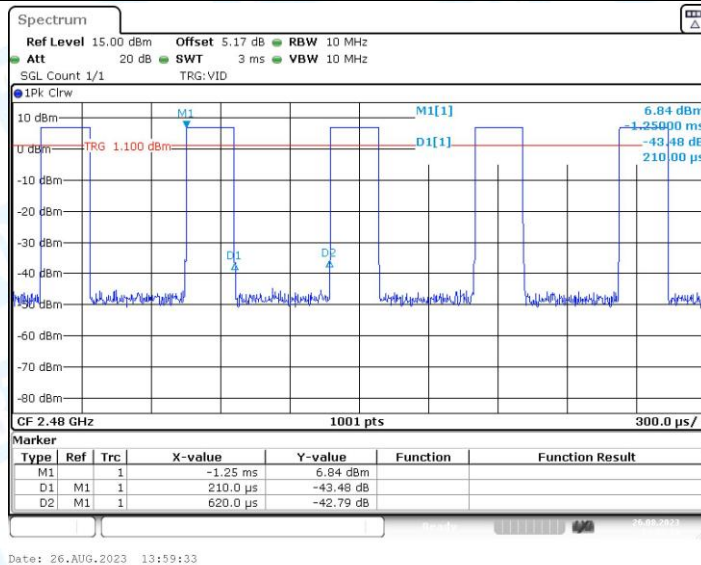
BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



BLE_2M_Ant1_2480



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