

## 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 |                           |

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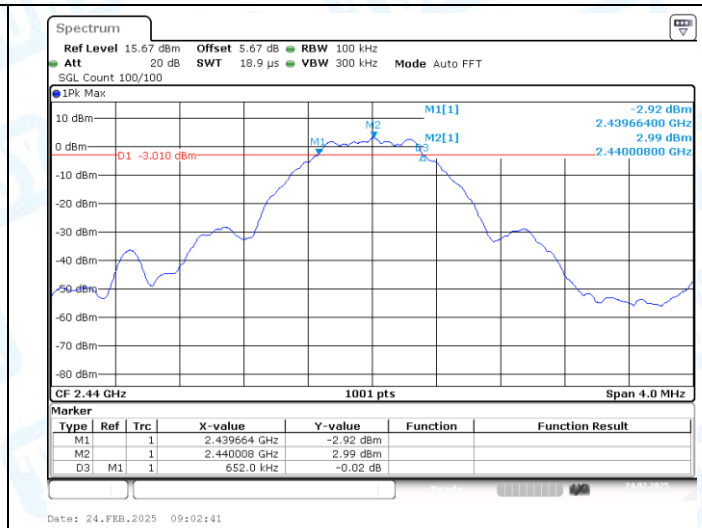
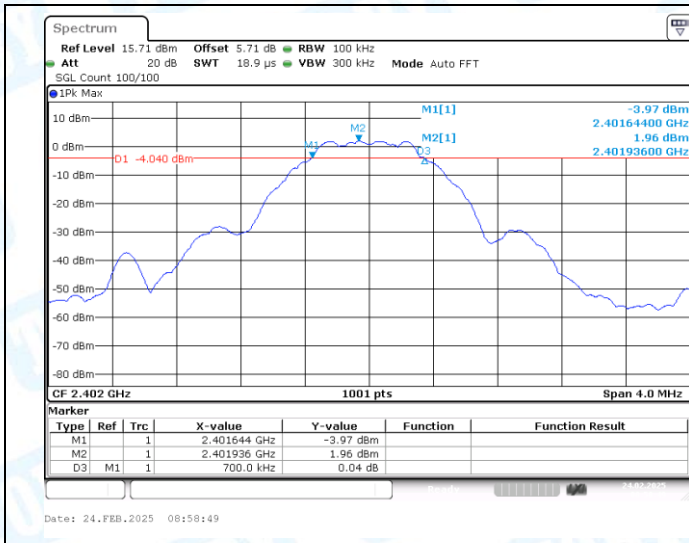


## 1: DTS Bandwidth

### 1.1 Test Result

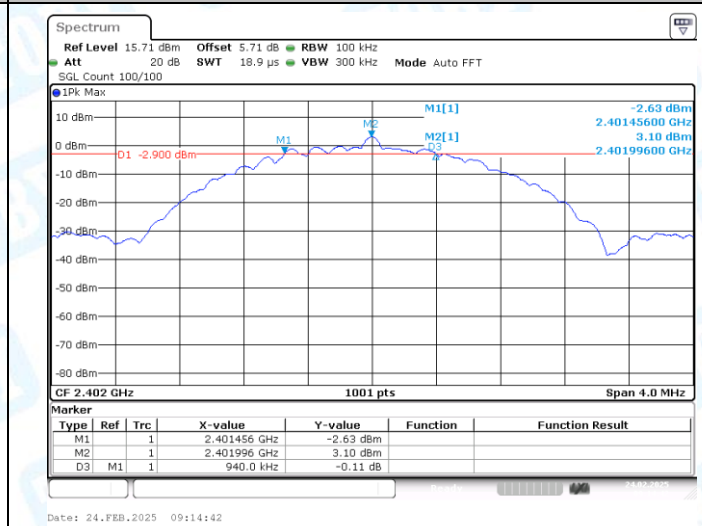
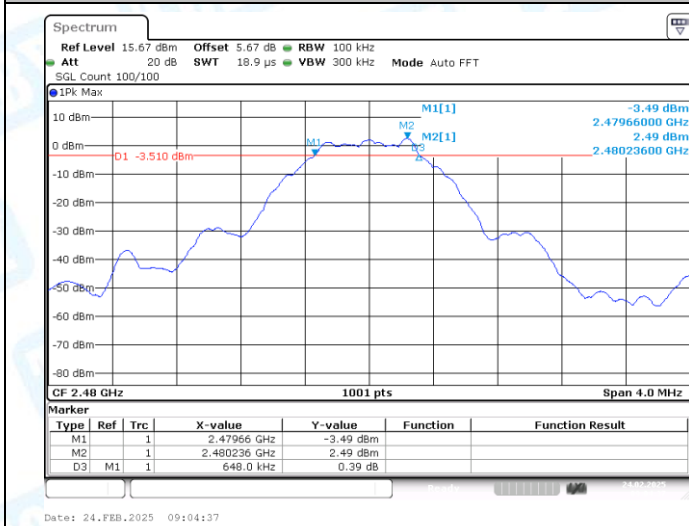
| Test Mode | Antenna | Frequency[MHz] | DTS BW [MHz] | FL[MHz] | FH[MHz] | Limit[MHz] | Verdict |
|-----------|---------|----------------|--------------|---------|---------|------------|---------|
| BLE_1M    | Ant1    | 2402           | 0.70         | 2401.64 | 2402.34 | 0.5        | PASS    |
| BLE_1M    | 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



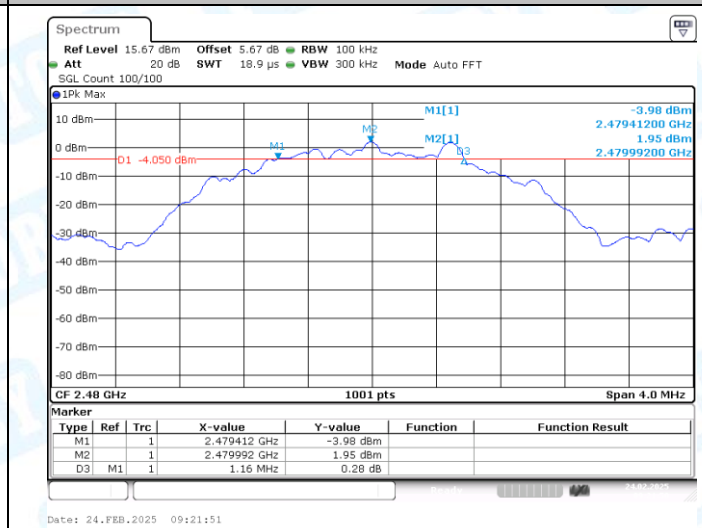
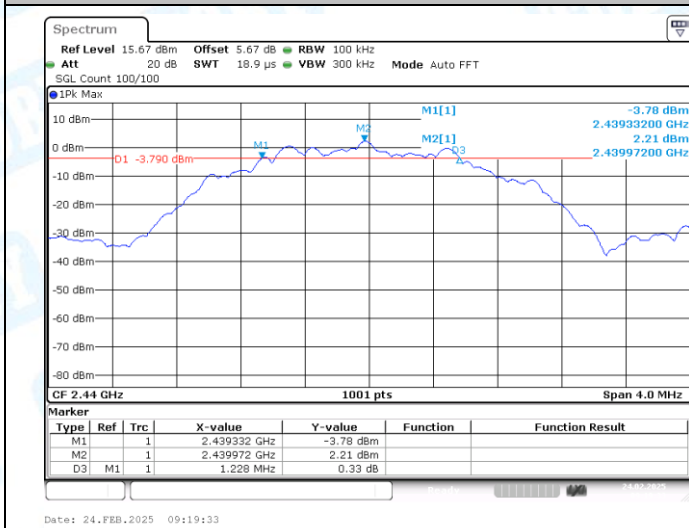
BLE\_1M-Ant1-2402-PASS

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

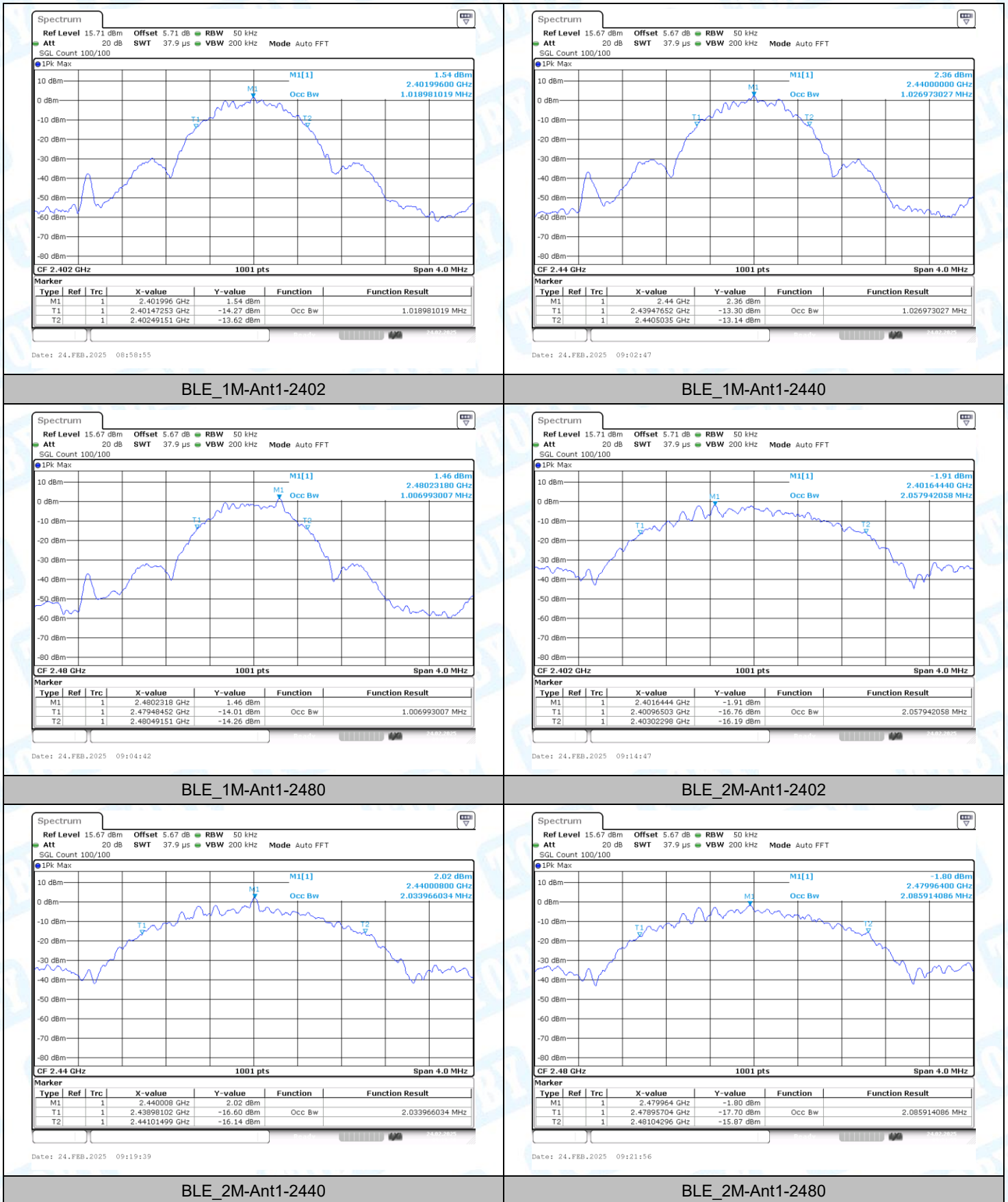


## 2: Occupied Channel Bandwidth

### 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



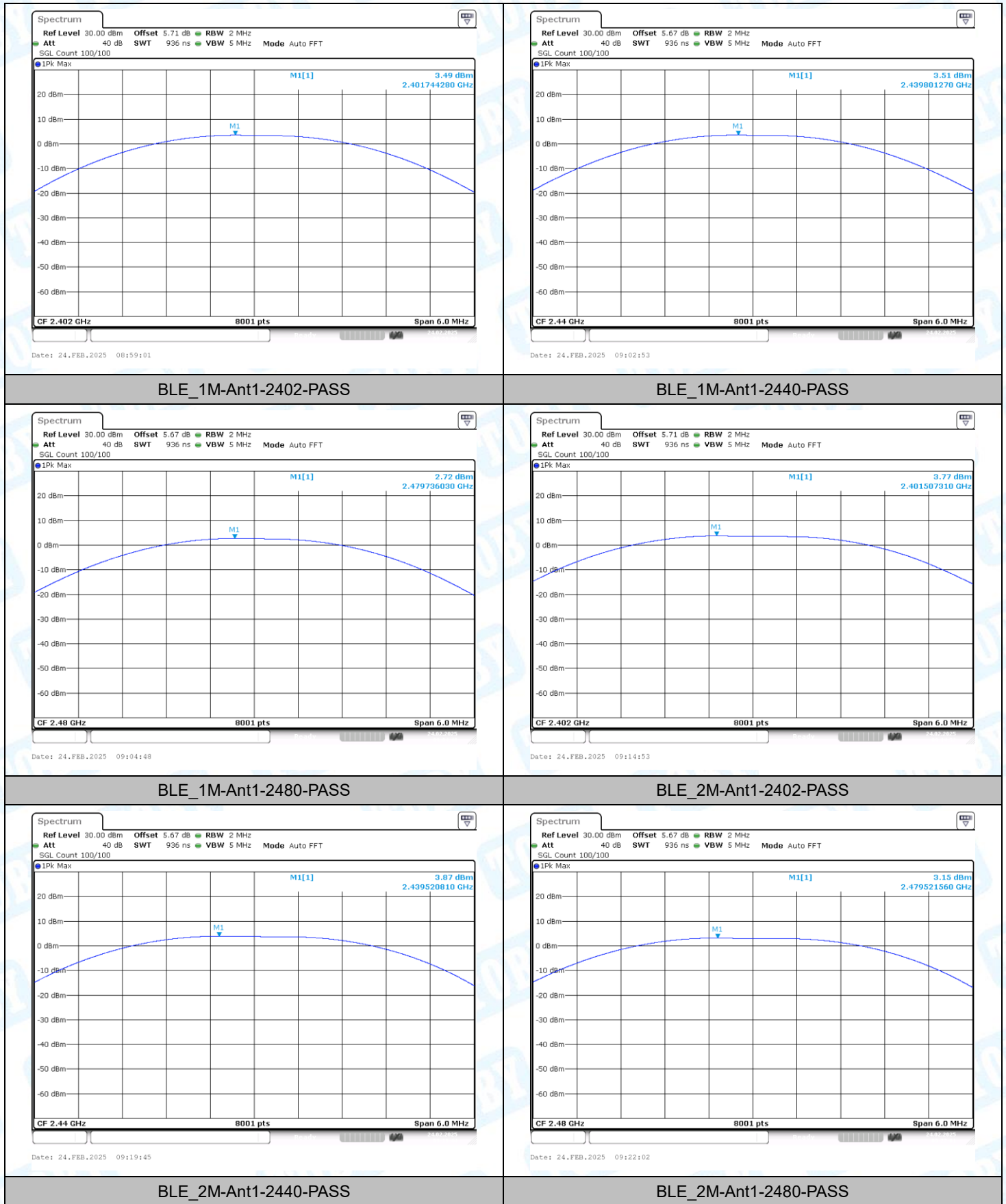


### 3: Maximum conducted output power

#### 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



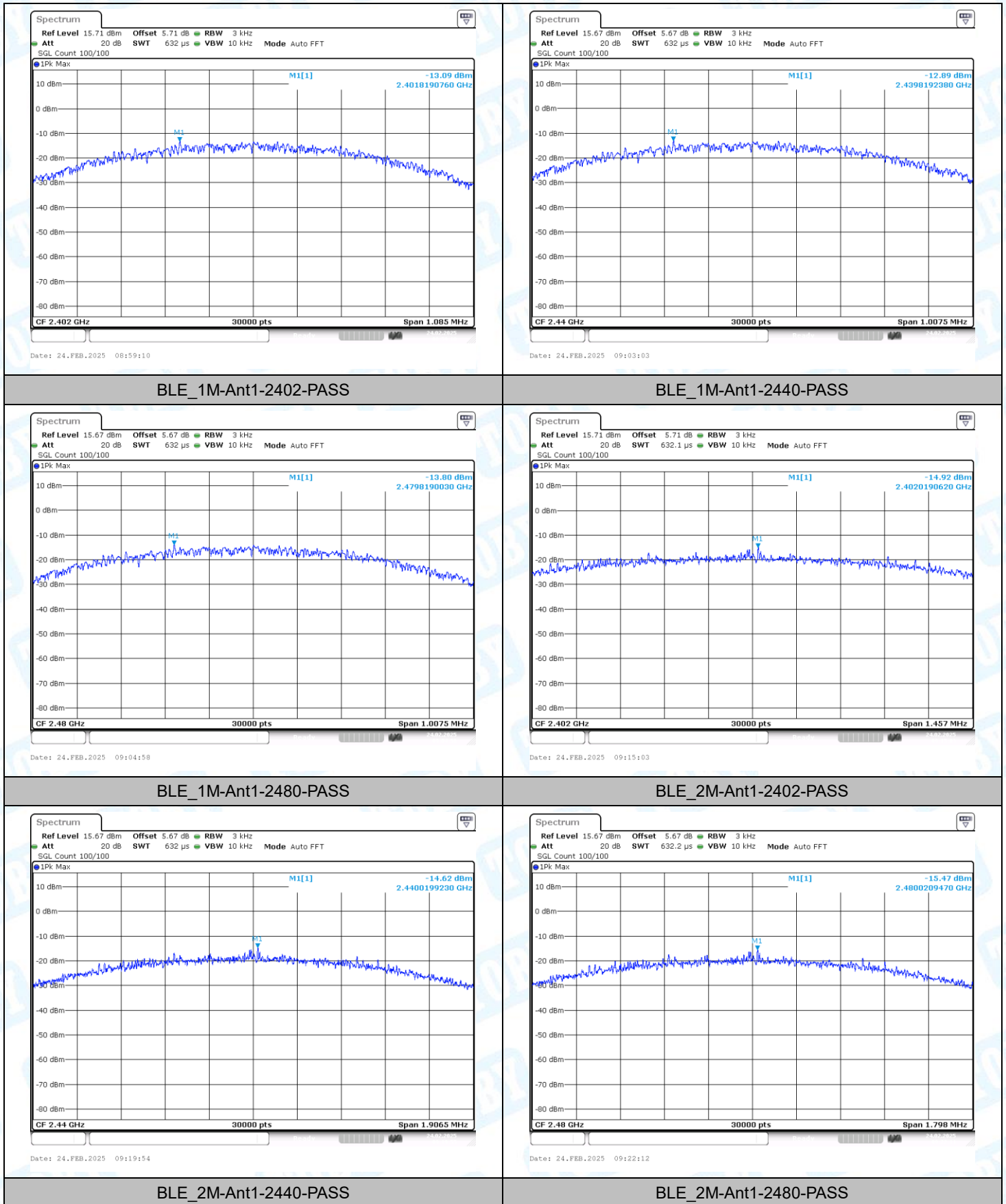


## 4: Maximum power spectral density

### 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



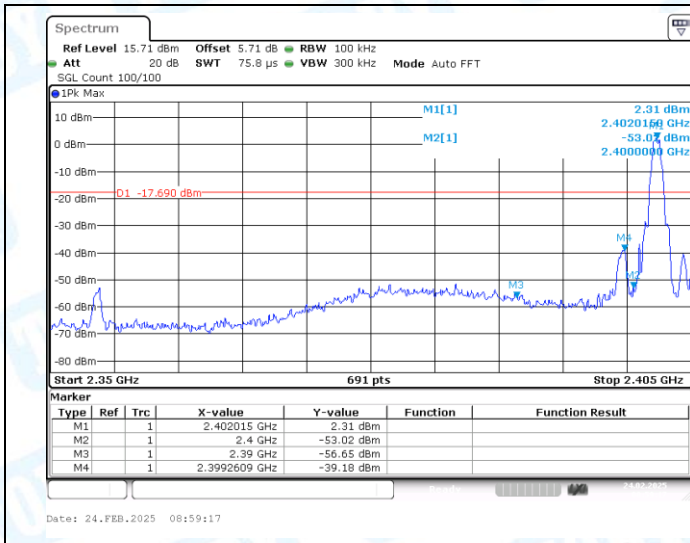


## 5: Band edge measurements

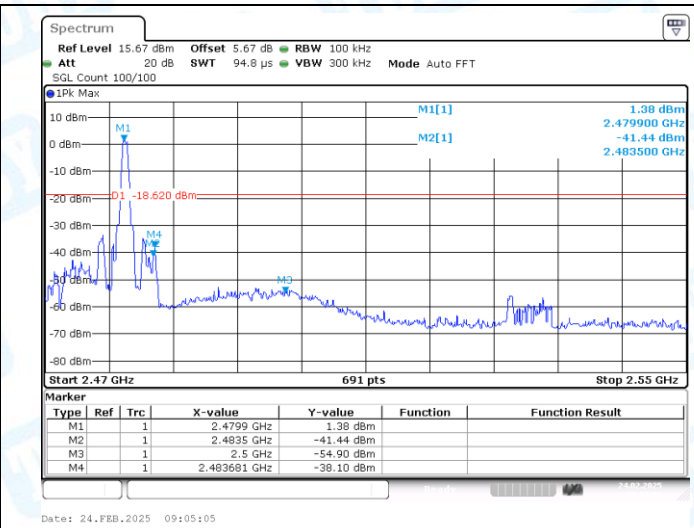
### 5.1 Test Result

| 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    |

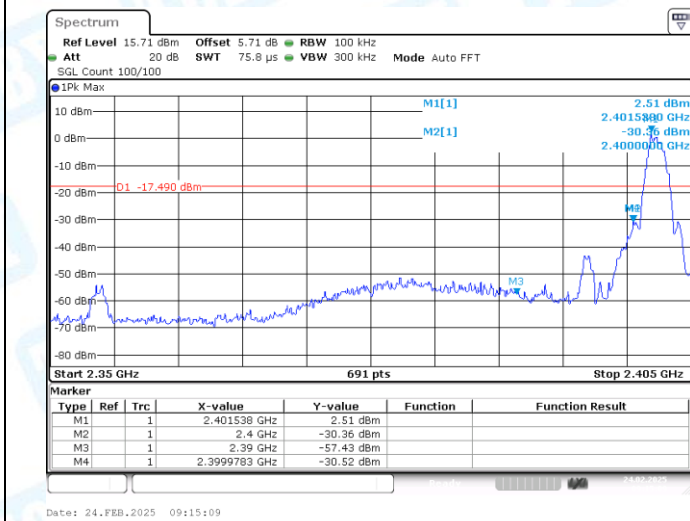
## 5.2 Test Graphs



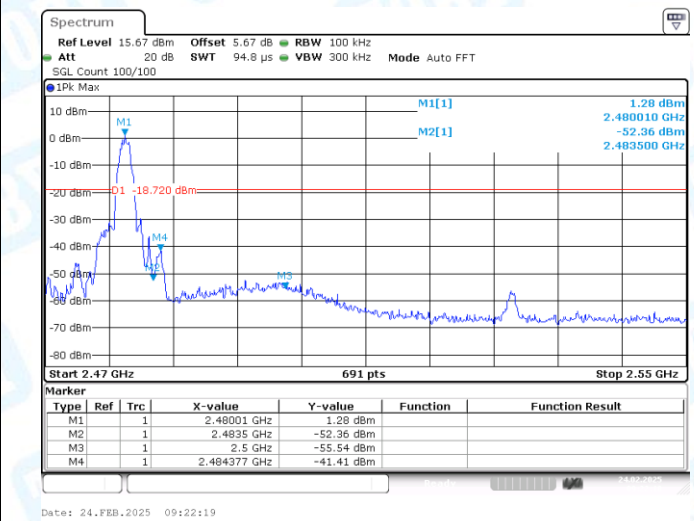
BLE\_1M-Ant1-2402-PASS



BLE\_1M-Ant1-2480-PASS



BLE\_2M-Ant1-2402-PASS



BLE\_2M-Ant1-2480-PASS

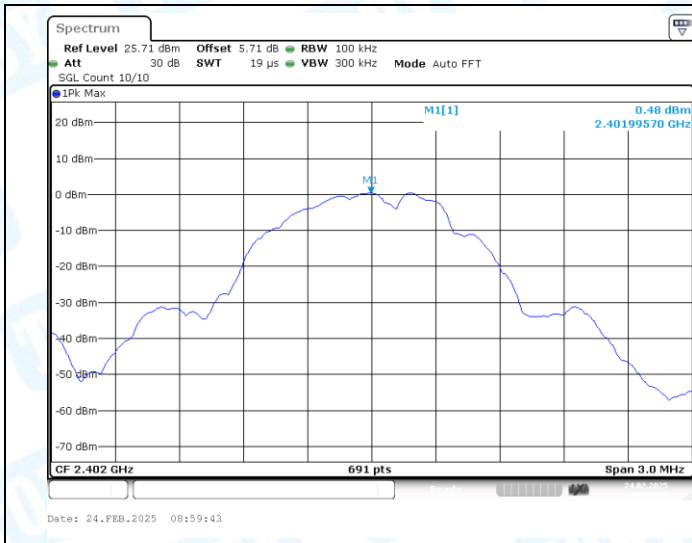


## 6: Conducted Spurious Emission

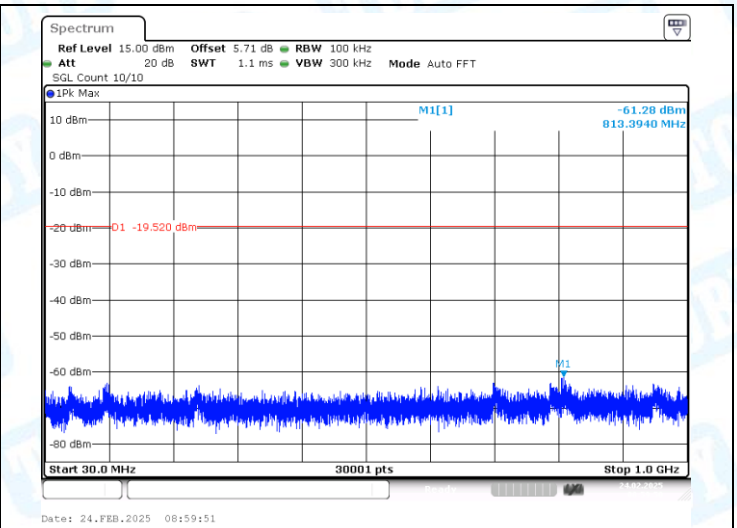
### 6.1 Test Result

| 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    |

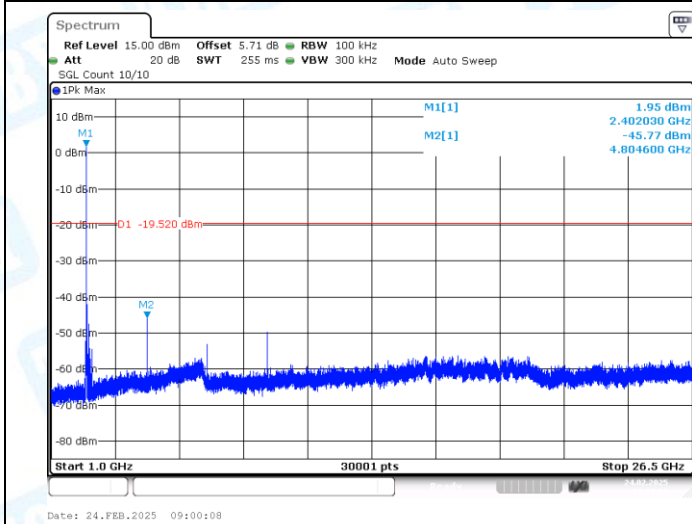
## 6.2 Test Graphs



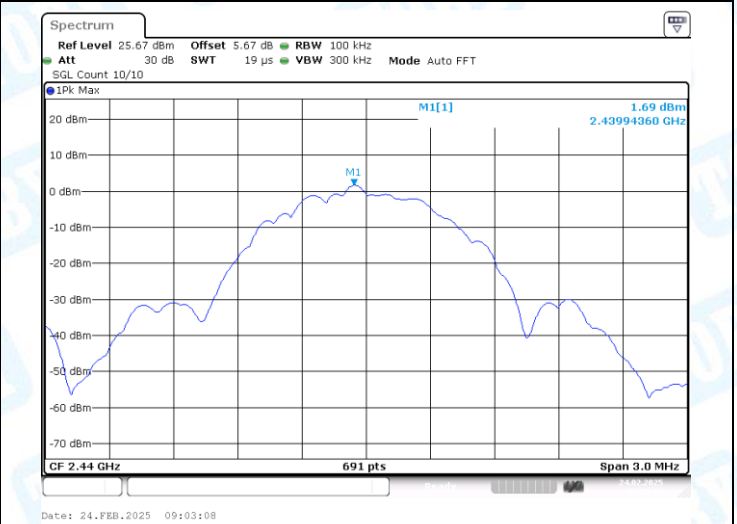
BLE\_1M-Ant1-2402-0~Reference-PASS



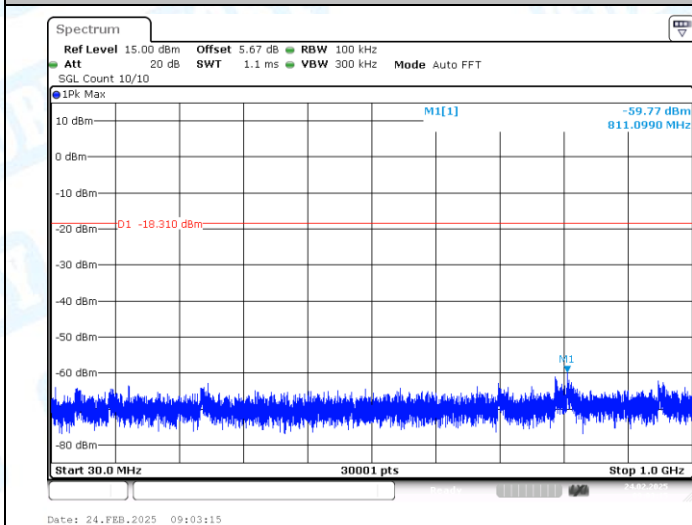
BLE\_1M-Ant1-2402-30~1000-PASS



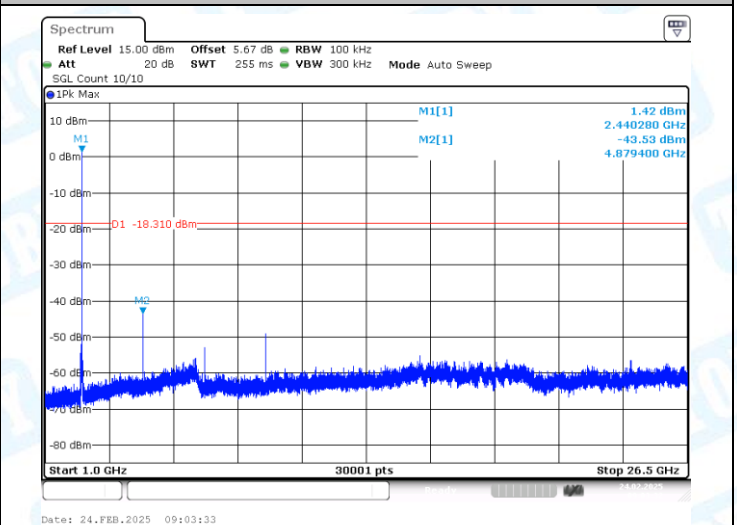
BLE\_1M-Ant1-2402-1000~26500-PASS



BLE\_1M-Ant1-2440-0~Reference-PASS

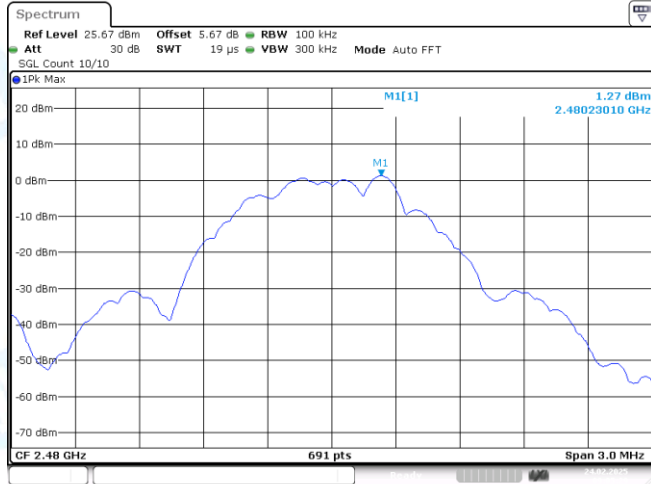


BLE\_1M-Ant1-2440-30~1000-PASS



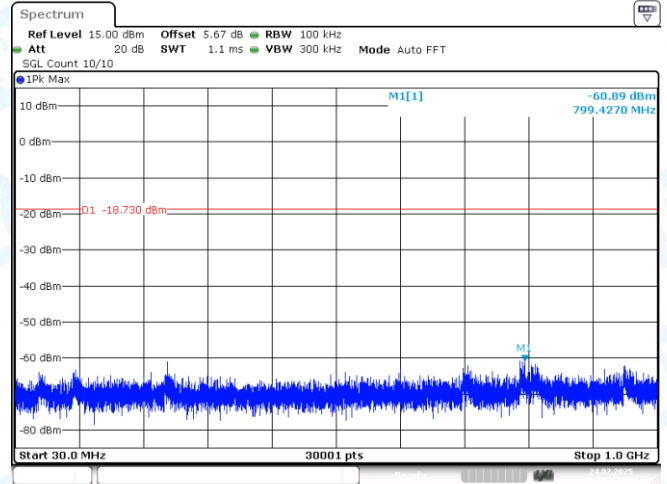
BLE\_1M-Ant1-2440-1000~26500-PASS





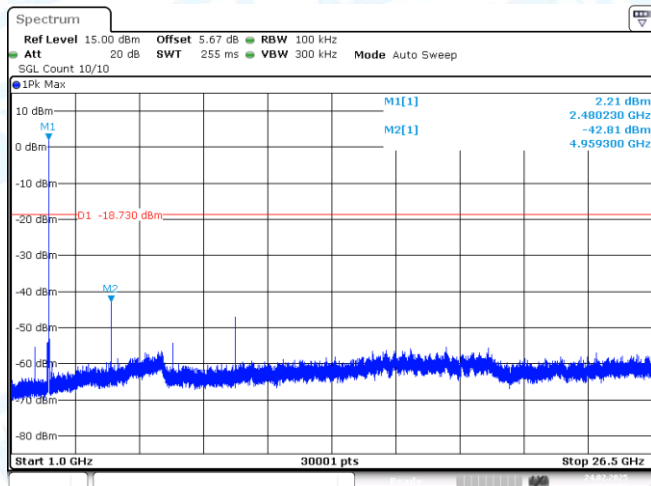
Date: 24.FEB.2025 09:05:29

BLE\_1M-Ant1-2480-0~Reference-PASS



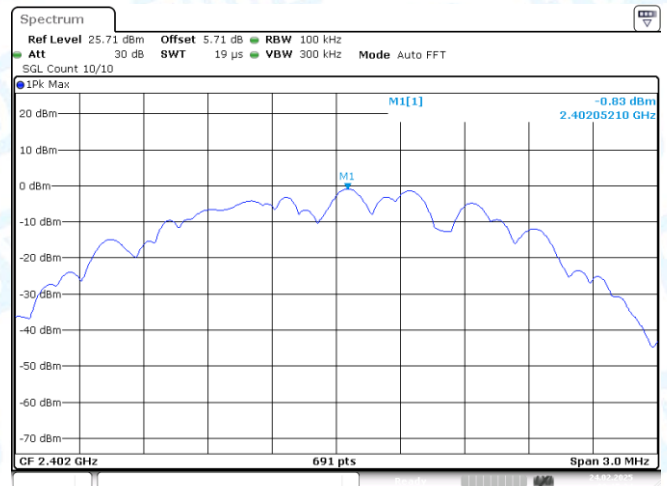
Date: 24.FEB.2025 09:05:37

BLE\_1M-Ant1-2480-30~1000-PASS



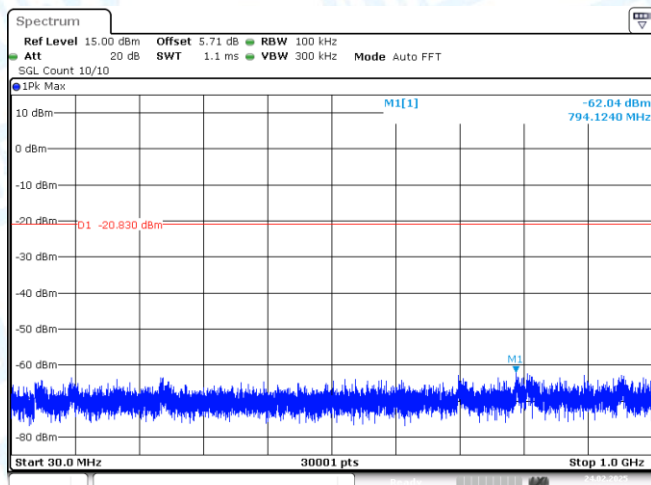
Date: 24.FEB.2025 09:05:54

BLE\_1M-Ant1-2480-1000~26500-PASS



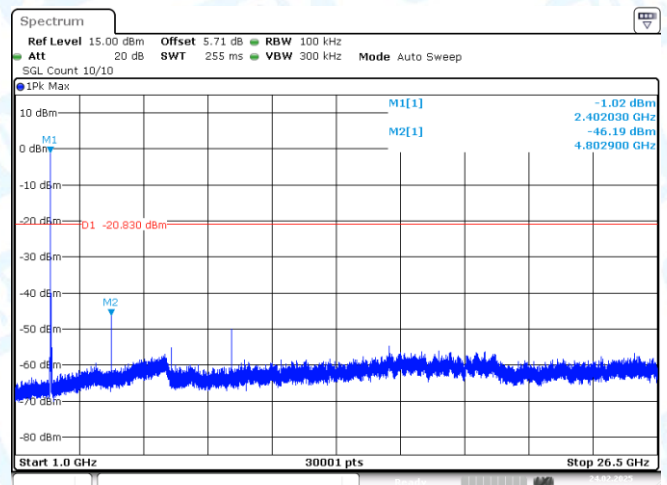
Date: 24.FEB.2025 09:15:35

BLE\_2M-Ant1-2402-0~Reference-PASS



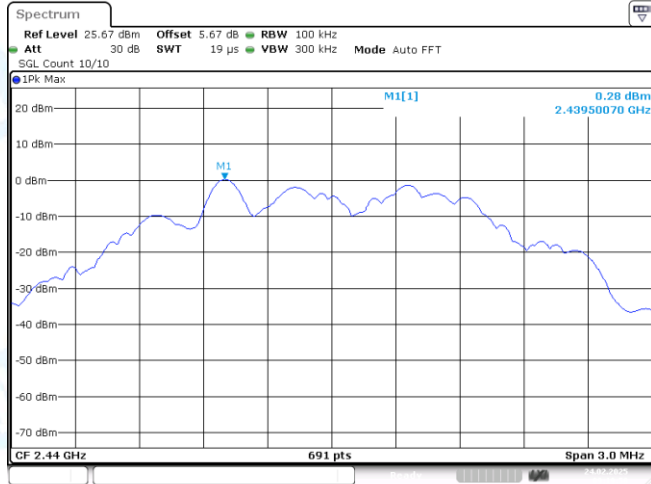
Date: 24.FEB.2025 09:15:42

BLE\_2M-Ant1-2402-30~1000-PASS



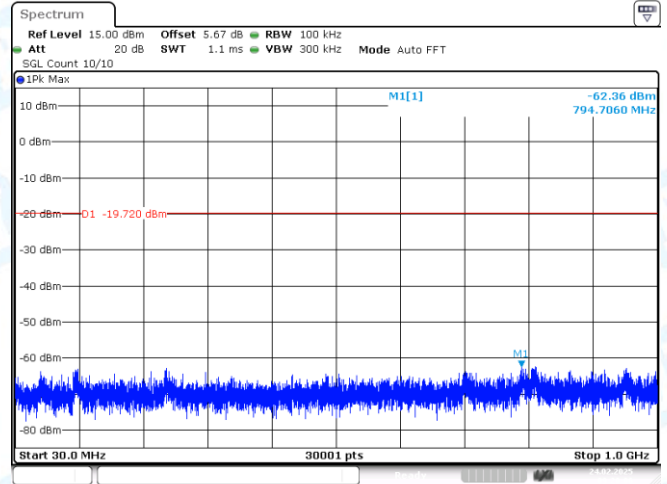
Date: 24.FEB.2025 09:16:00

BLE\_2M-Ant1-2402-1000~26500-PASS



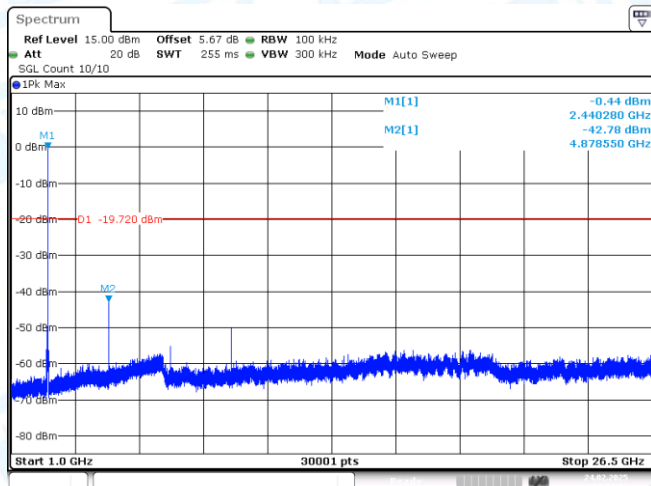
Date: 24.FEB.2025 09:19:59

BLE\_2M-Ant1-2440-0~Reference-PASS



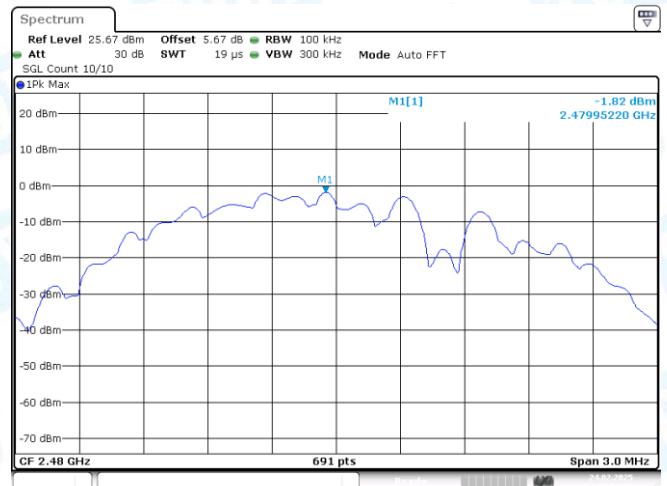
Date: 24.FEB.2025 09:20:06

BLE\_2M-Ant1-2440-30~1000-PASS



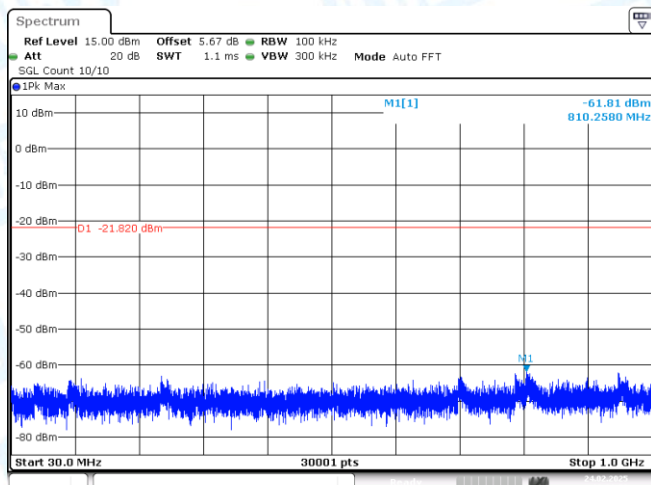
Date: 24.FEB.2025 09:20:23

BLE\_2M-Ant1-2440-1000~26500-PASS



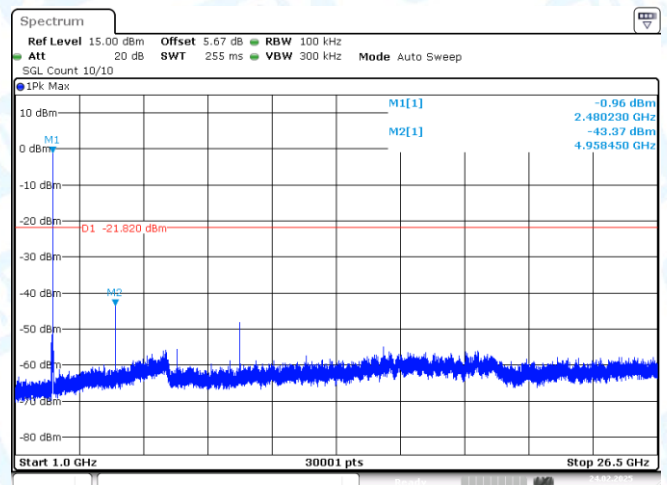
Date: 24.FEB.2025 09:22:43

BLE\_2M-Ant1-2480-0~Reference-PASS



Date: 24.FEB.2025 09:22:50

BLE\_2M-Ant1-2480-30~1000-PASS



Date: 24.FEB.2025 09:23:08

BLE\_2M-Ant1-2480-1000~26500-PASS



## 7: Duty Cycle

### 7.1 Test Result

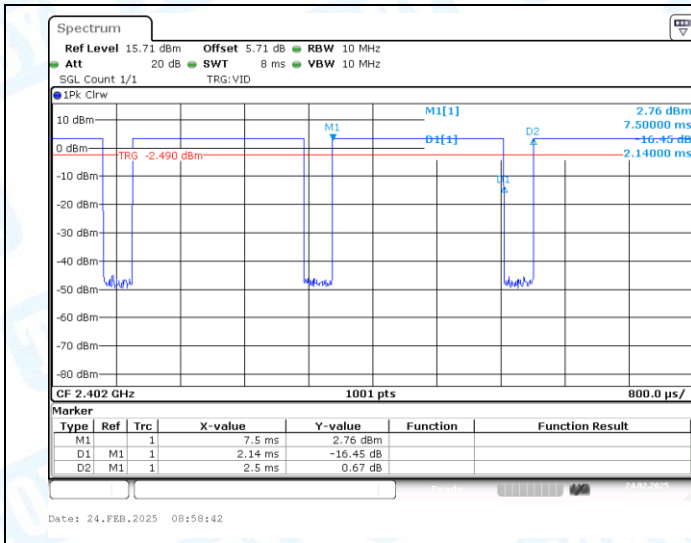
| TestMode | Antenna | Frequency [MHz] | Transmission Duration [ms] | Transmission Period [ms] | Duty Cycle [%] | DC Factory | 1/T [kHz] |
|----------|---------|-----------------|----------------------------|--------------------------|----------------|------------|-----------|
| BLE_1M   | Ant1    | 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

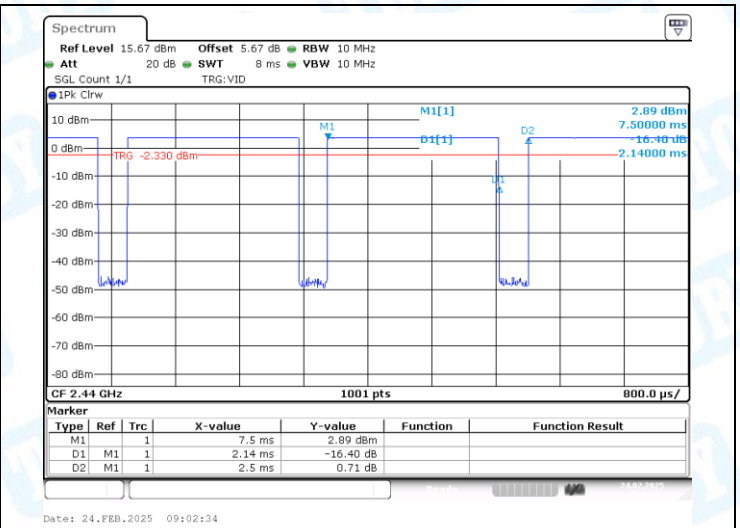
2, DC Factory=10\*Log<sub>10</sub>(1/Duty Cycle)

3, 1/T=1/ Transmission Duration

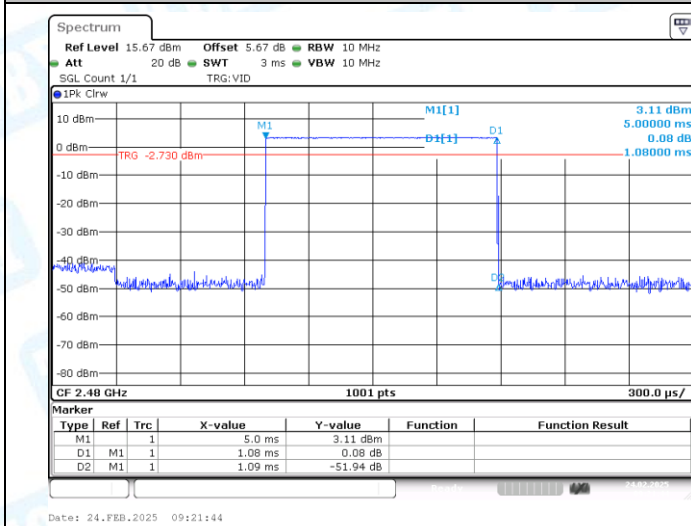
## 7.2 Test Graphs



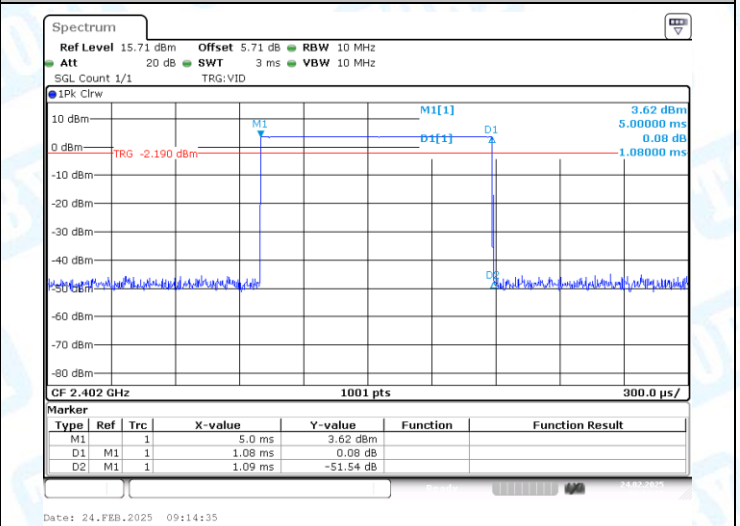
NTVN-BLE\_1M-Ant1-2402



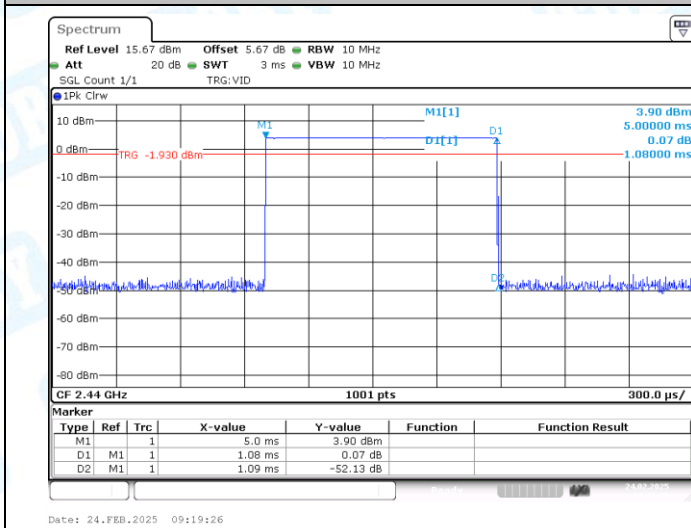
NTVN-BLE\_1M-Ant1-2440



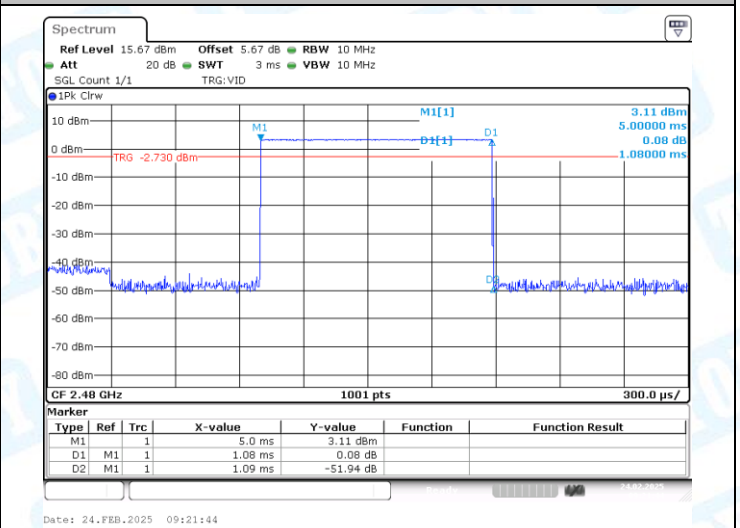
NTVN-BLE\_1M-Ant1-2480



NTVN-BLE\_2M-Ant1-2402



NTVN-BLE\_2M-Ant1-2440



NTVN-BLE\_2M-Ant1-2480



## 8: Emissions in Restricted Bands

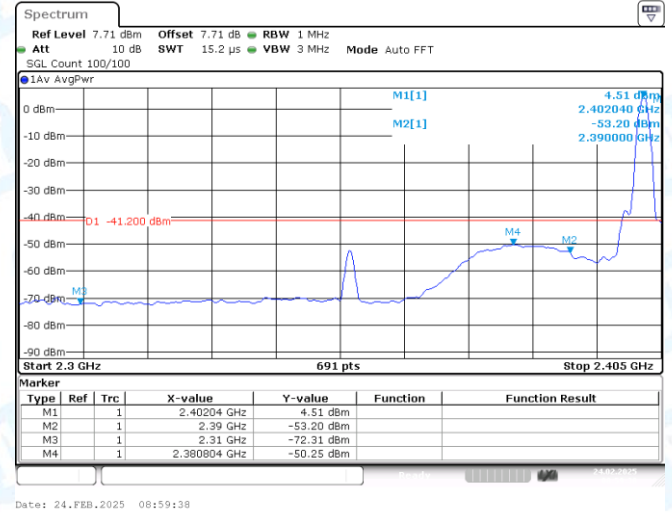
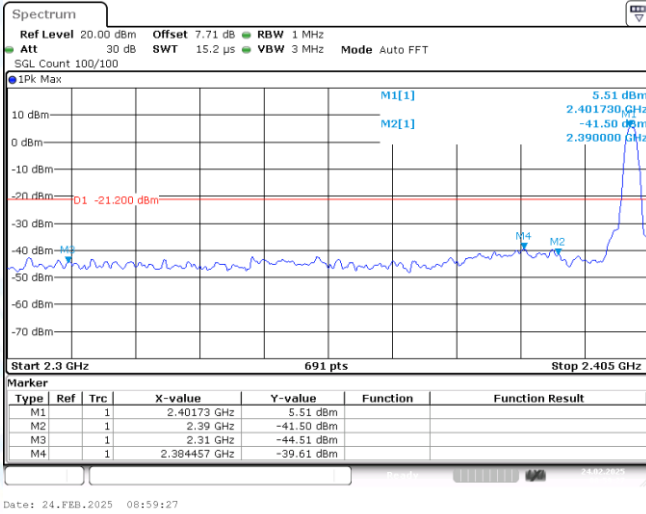
### 8.1 Test Result

| 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:

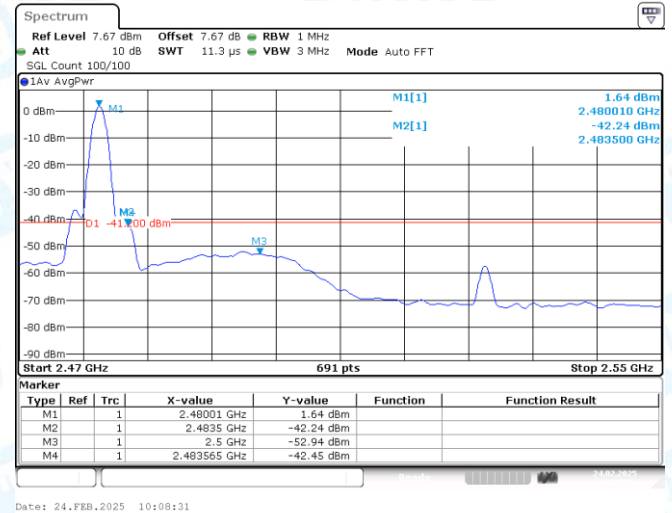
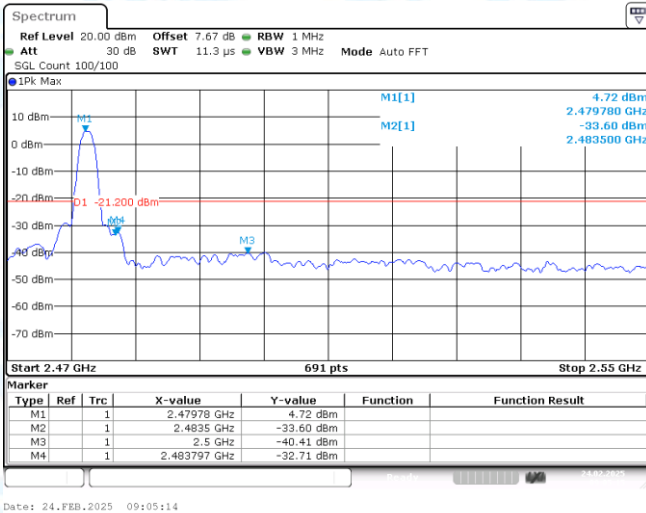
1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

## 8.2 Test Graphs



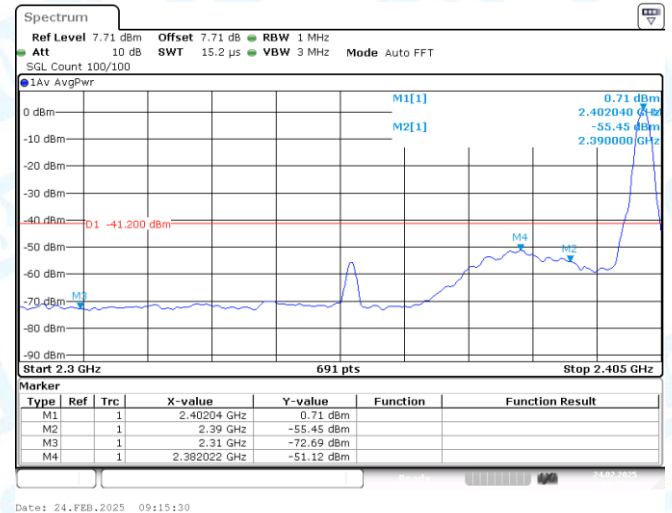
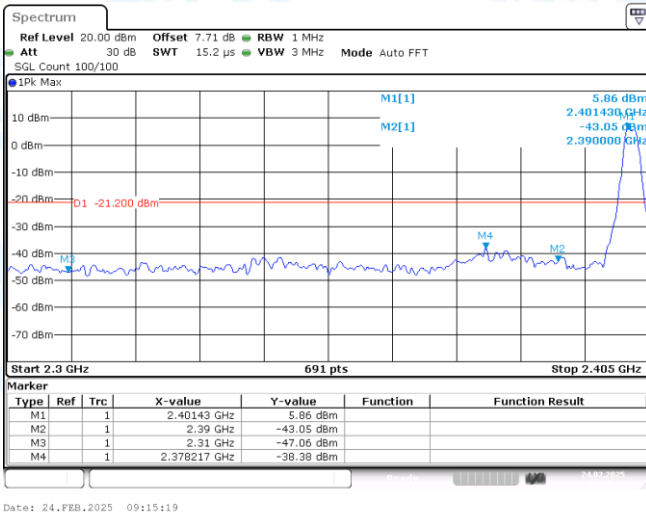
BLE\_1M-Ant1-2402-PASS

BLE\_1M-Ant1-2402-PASS



BLE\_1M-Ant1-2480-PASS

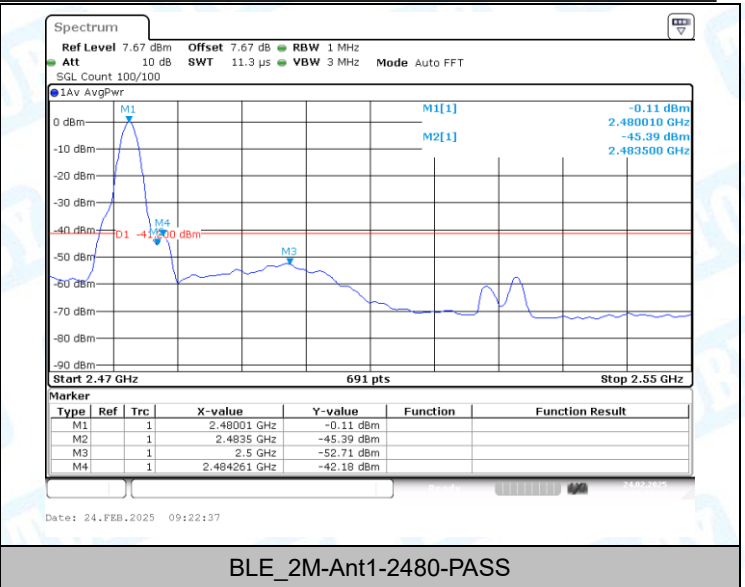
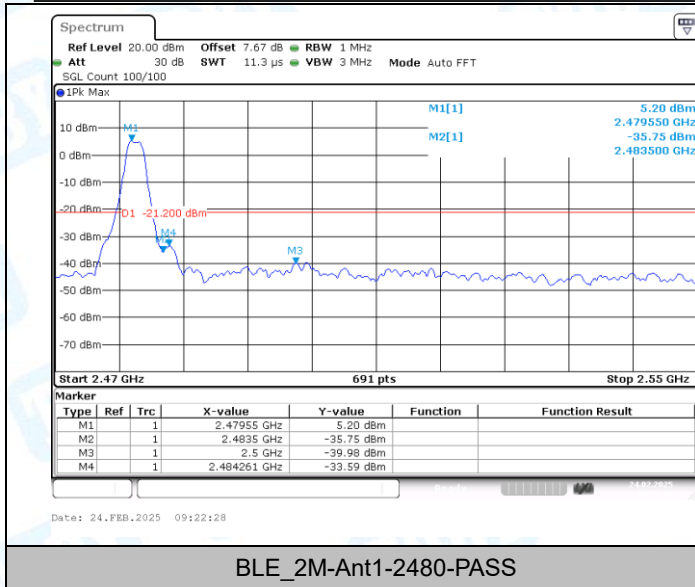
BLE\_1M-Ant1-2480-PASS



BLE\_2M-Ant1-2402-PASS

BLE\_2M-Ant1-2402-PASS





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