

## **FCC Appendix RF Test Data for BLE**

**FCC ID** : 2BVLG-MEGA-CQ25R

**Company** : Zentron LLC

**EUT** : Thermal imaging device

**Model Number** : CQ25R

**Report No.** : CTA26041400501

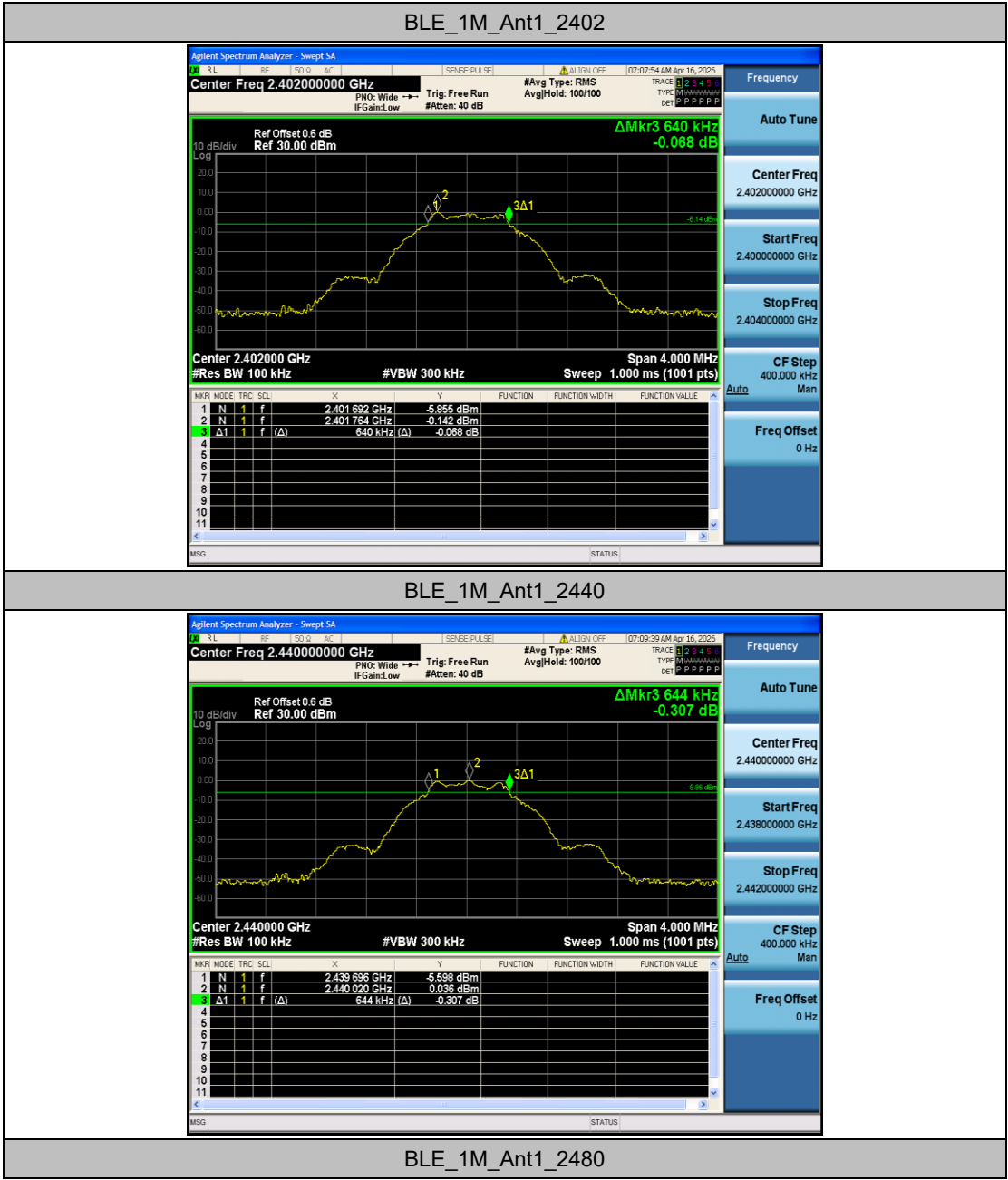
**Reviewed By** : Eric Wang

## Appendix A: DTS Bandwidth

### Test Result

| TestMode | Antenna | Freq(MHz) | DTS BW<br>[MHz] | FL[MHz]  | FH[MHz]  | Limit[MHz] | Verdict |
|----------|---------|-----------|-----------------|----------|----------|------------|---------|
| BLE_1M   | Ant1    | 2402      | 0.640           | 2401.692 | 2402.332 | 0.5        | PASS    |
|          |         | 2440      | 0.644           | 2439.696 | 2440.340 | 0.5        | PASS    |
|          |         | 2480      | 0.660           | 2479.680 | 2480.340 | 0.5        | PASS    |
| BLE_2M   | Ant1    | 2402      | 1.076           | 2401.480 | 2402.556 | 0.5        | PASS    |
|          |         | 2440      | 1.076           | 2439.452 | 2440.528 | 0.5        | PASS    |
|          |         | 2480      | 1.144           | 2479.448 | 2480.592 | 0.5        | PASS    |

Test Graphs





BLE\_2M\_Ant1\_2402



BLE\_2M\_Ant1\_2440



# BLE\_2M\_Ant1\_2480

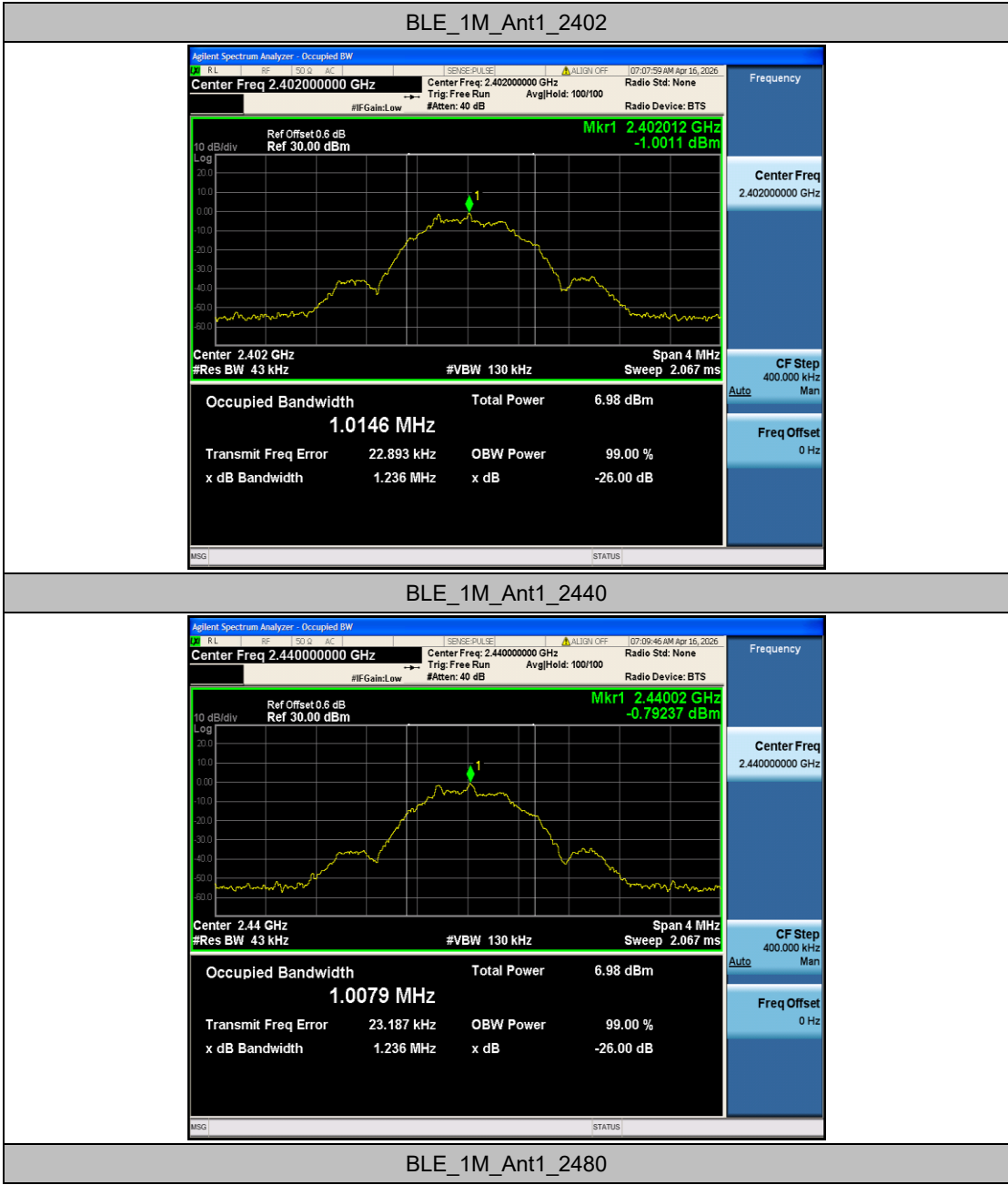


## Appendix B: Occupied Channel Bandwidth

### Test Result

| TestMode | Antenna | Freq(MHz) | OCB [MHz] | FL[MHz]   | FH[MHz]   | Limit[MHz] | Verdict |
|----------|---------|-----------|-----------|-----------|-----------|------------|---------|
| BLE_1M   | Ant1    | 2402      | 1.0146    | 2401.5156 | 2402.5302 | ---        | ---     |
|          |         | 2440      | 1.0079    | 2439.5192 | 2440.5271 | ---        | ---     |
|          |         | 2480      | 1.0015    | 2479.5224 | 2480.5239 | ---        | ---     |
| BLE_2M   | Ant1    | 2402      | 2.0178    | 2401.0271 | 2403.0449 | ---        | ---     |
|          |         | 2440      | 2.0059    | 2439.0283 | 2441.0342 | ---        | ---     |
|          |         | 2480      | 2.0123    | 2479.0268 | 2481.0391 | ---        | ---     |

Test Graphs





BLE\_2M\_Ant1\_2402



BLE\_2M\_Ant1\_2440



# BLE\_2M\_Ant1\_2480



## Appendix C: Maximum conducted output power

### Test Result Peak

| TestMode | Antenna | Freq(MHz) | Conducted Peak Power[dBm] | Conducted Limit[dBm] | Verdict |
|----------|---------|-----------|---------------------------|----------------------|---------|
| BLE_1M   | Ant1    | 2402      | 0.44                      | ≤30                  | PASS    |
|          |         | 2440      | 0.19                      | ≤30                  | PASS    |
|          |         | 2480      | 0.18                      | ≤30                  | PASS    |
| BLE_2M   | Ant1    | 2402      | 0.41                      | ≤30                  | PASS    |
|          |         | 2440      | 0.20                      | ≤30                  | PASS    |
|          |         | 2480      | 0.13                      | ≤30                  | PASS    |

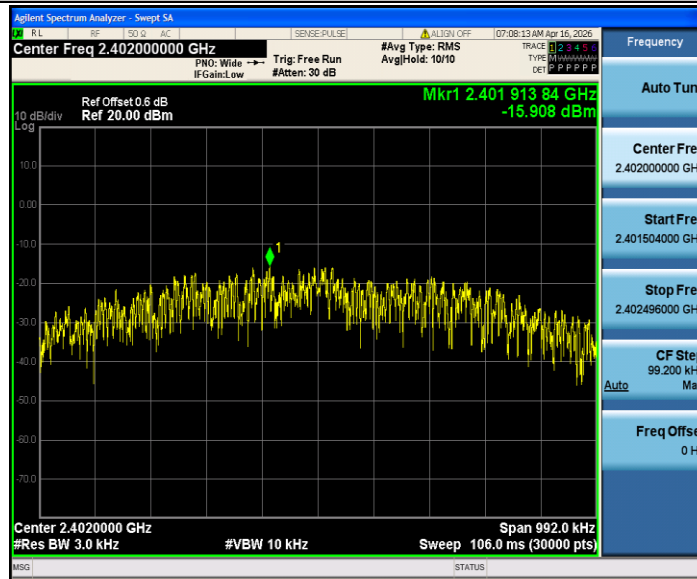
## Appendix D: Maximum power spectral density

### Test Result

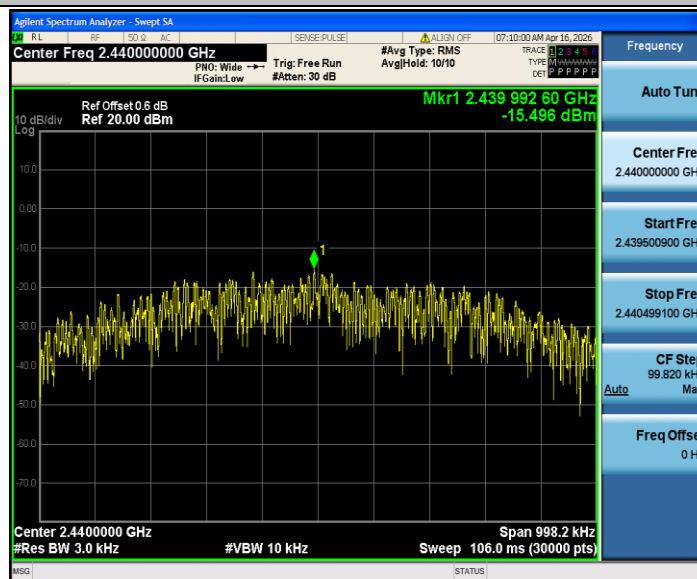
| TestMode | Antenna | Freq(MHz) | Result[dBm/3kHz] | Limit[dBm/3kHz] | Verdict |
|----------|---------|-----------|------------------|-----------------|---------|
| BLE_1M   | Ant1    | 2402      | -15.91           | ≤8.00           | PASS    |
|          |         | 2440      | -15.50           | ≤8.00           | PASS    |
|          |         | 2480      | -15.25           | ≤8.00           | PASS    |
| BLE_2M   | Ant1    | 2402      | -16.99           | ≤8.00           | PASS    |
|          |         | 2440      | -17.13           | ≤8.00           | PASS    |
|          |         | 2480      | -17.51           | ≤8.00           | PASS    |

## Test Graphs

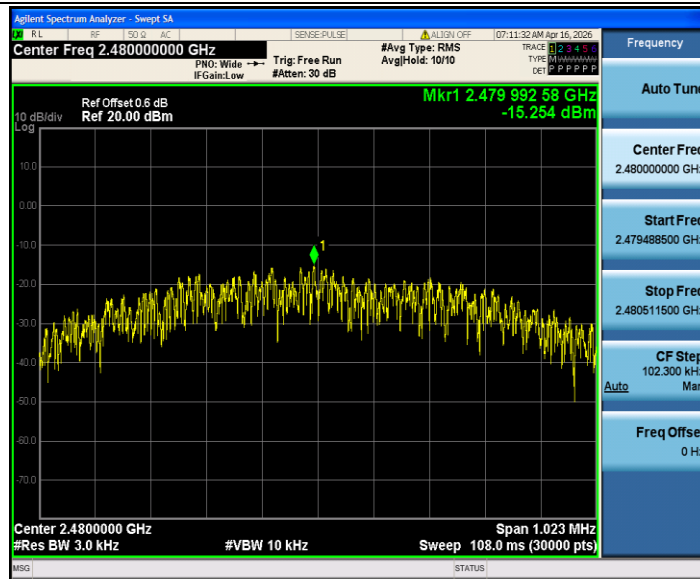
BLE\_1M\_Ant1\_2402



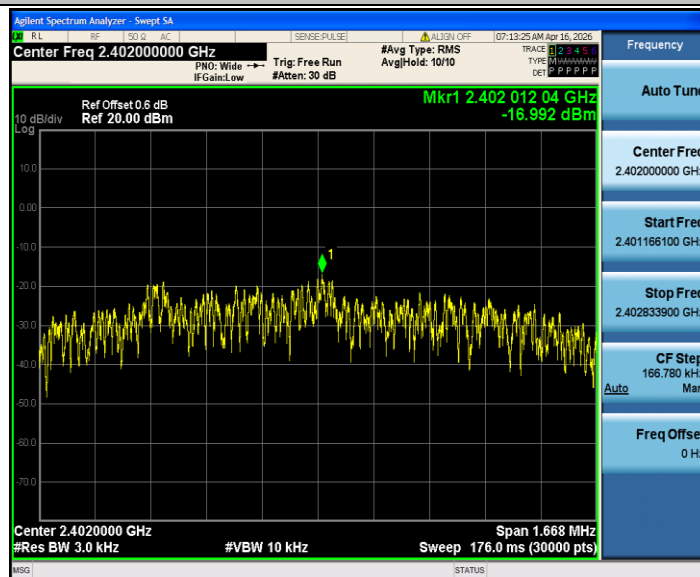
BLE\_1M\_Ant1\_2440



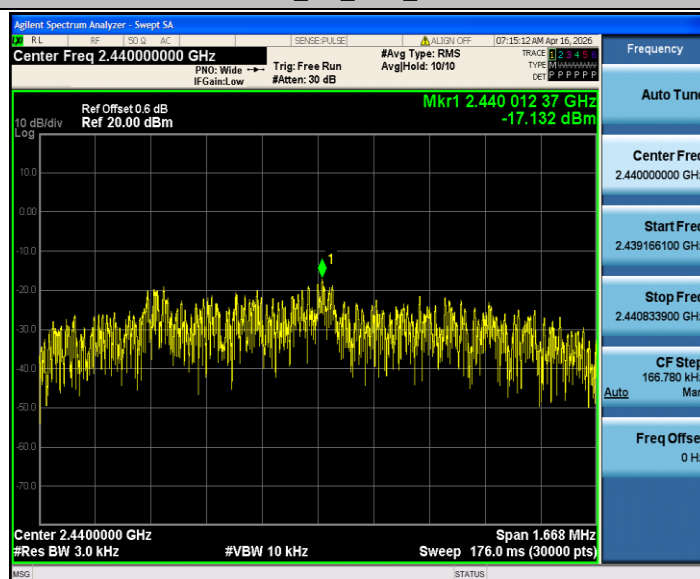
BLE\_1M\_Ant1\_2480



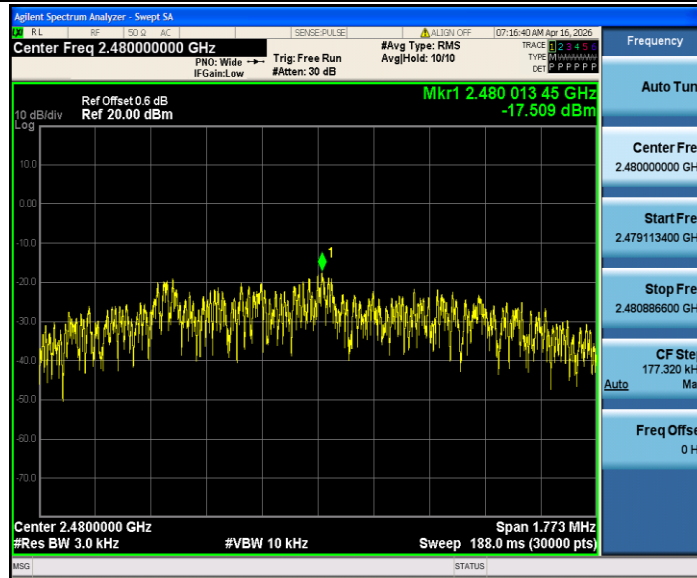
BLE\_2M\_Ant1\_2402



BLE\_2M\_Ant1\_2440



# BLE\_2M\_Ant1\_2480

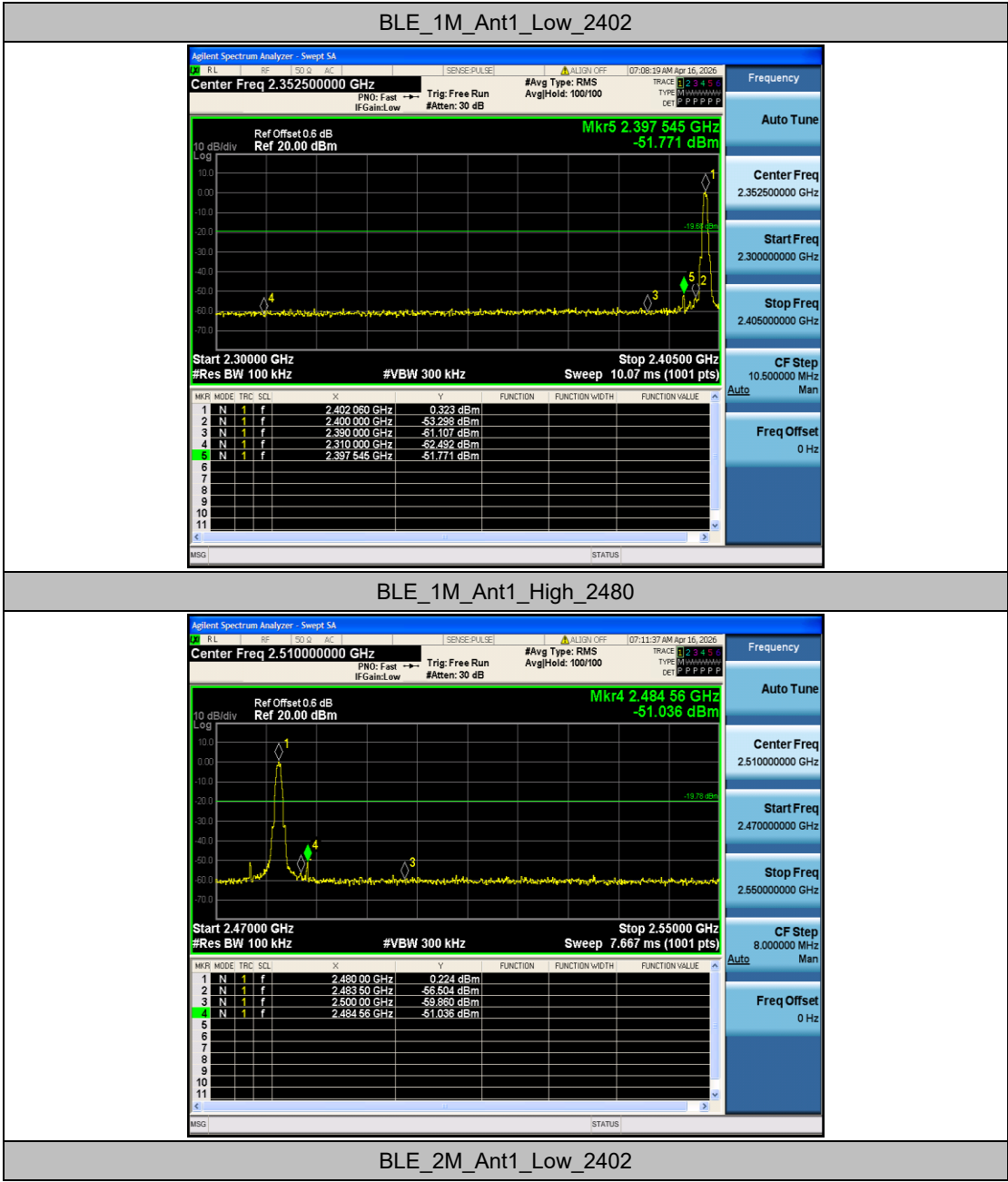


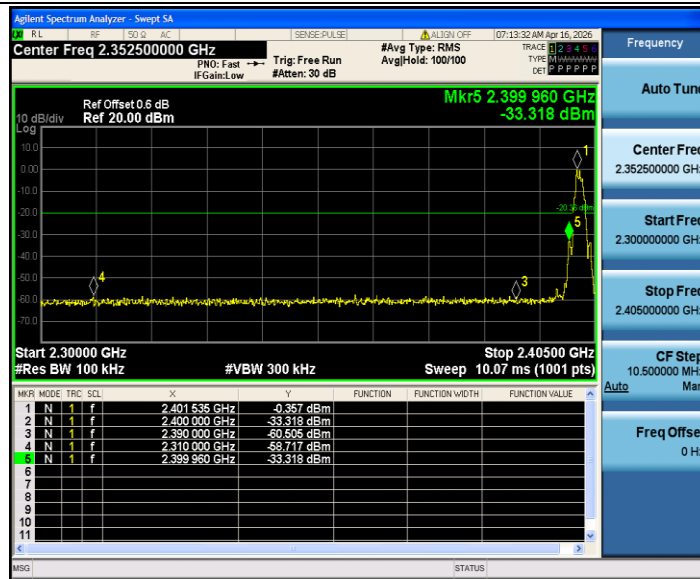
## Appendix E: Band edge measurements

### Test Result

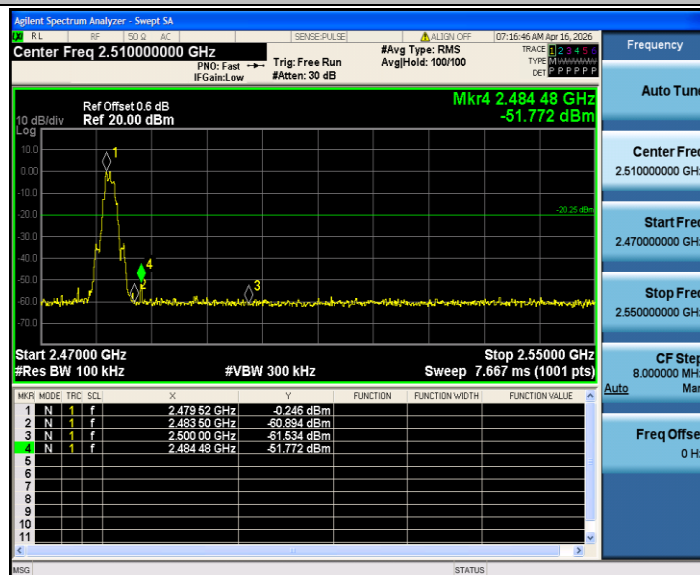
| TestMode | Antenna | Channel | Freq(MHz) | RefLevel[dBm] | Result[dBm] | Limit[dBm] | Verdict |
|----------|---------|---------|-----------|---------------|-------------|------------|---------|
| BLE_1M   | Ant1    | Low     | 2402      | 0.32          | -51.77      | ≤-19.68    | PASS    |
|          |         | High    | 2480      | 0.22          | -51.04      | ≤-19.78    | PASS    |
| BLE_2M   | Ant1    | Low     | 2402      | -0.36         | -33.32      | ≤-20.36    | PASS    |
|          |         | High    | 2480      | -0.25         | -51.77      | ≤-20.25    | PASS    |

Test Graphs





### BLE\_2M\_Ant1\_High\_2480

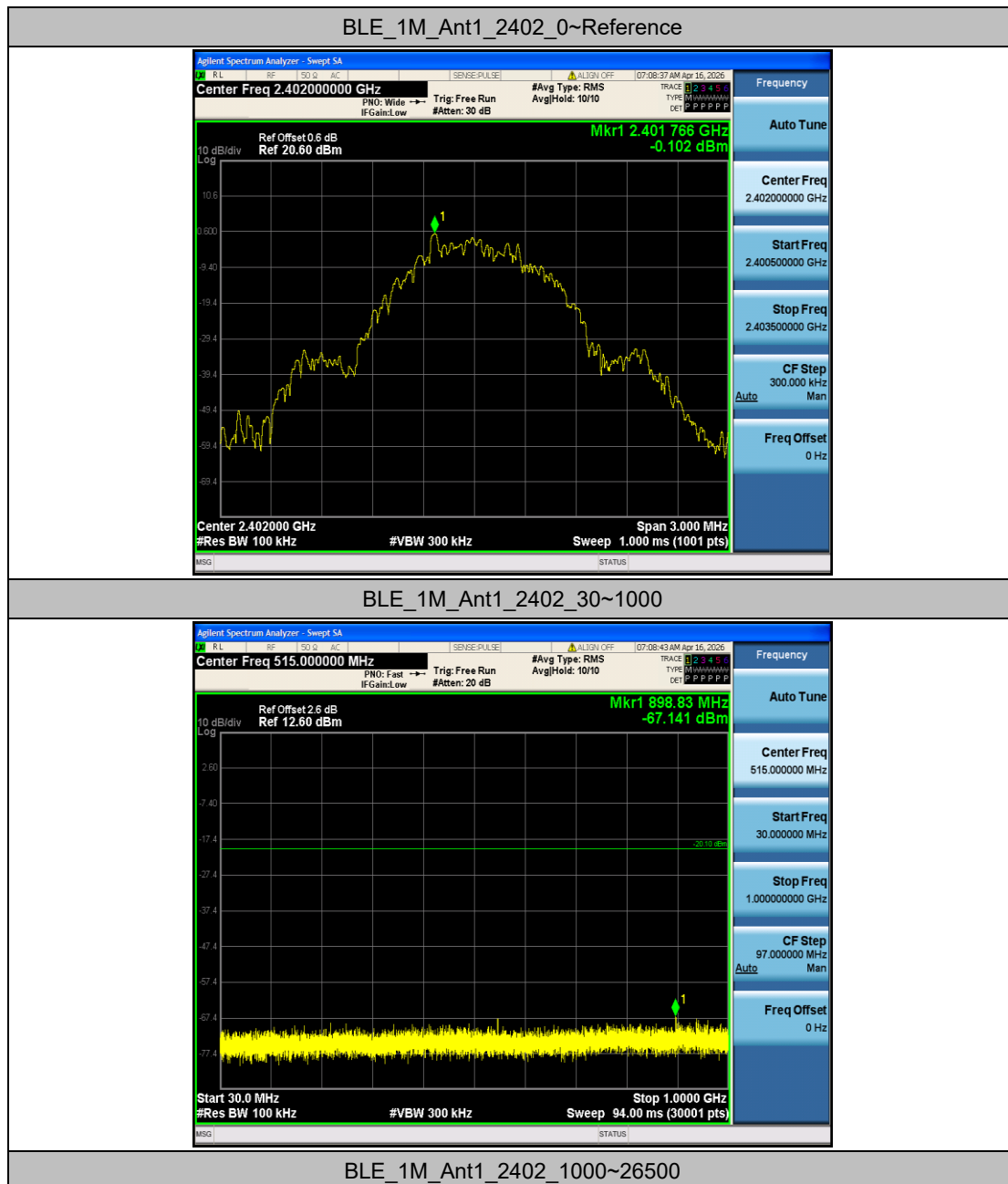


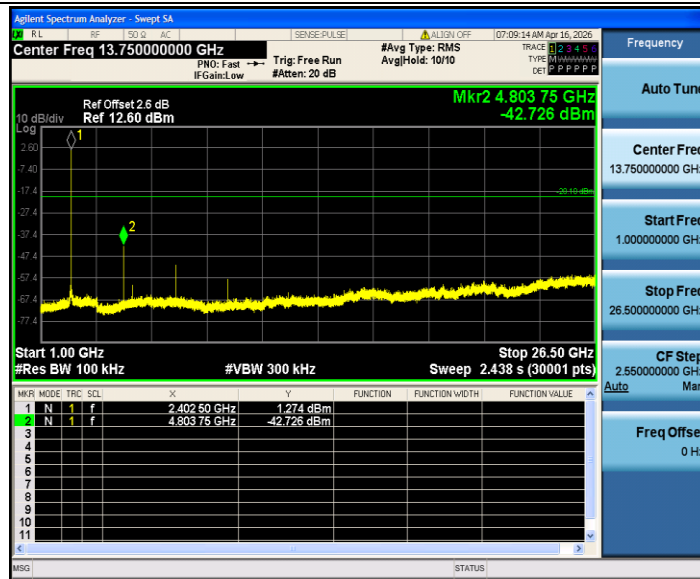
## Appendix F: Conducted Spurious Emission

### Test Result

| TestMode | Antenna | Freq(MHz) | FreqRange<br>[MHz] | RefLevel<br>[dBm] | Result[dBm] | Limit[dBm] | Verdict |
|----------|---------|-----------|--------------------|-------------------|-------------|------------|---------|
| BLE_1M   | Ant1    | 2402      | Reference          | -0.10             | -0.10       | ---        | PASS    |
|          |         |           | 30~1000            | -0.10             | -67.14      | ≤-20.1     | PASS    |
|          |         |           | 1000~26500         | -0.10             | -42.73      | ≤-20.1     | PASS    |
|          |         | 2440      | Reference          | -1.51             | -1.51       | ---        | PASS    |
|          |         |           | 30~1000            | -1.51             | -64.79      | ≤-21.51    | PASS    |
|          |         |           | 1000~26500         | -1.51             | -41.67      | ≤-21.51    | PASS    |
|          |         | 2480      | Reference          | -1.10             | -1.10       | ---        | PASS    |
|          |         |           | 30~1000            | -1.10             | -68.01      | ≤-21.1     | PASS    |
|          |         |           | 1000~26500         | -1.10             | -43.23      | ≤-21.1     | PASS    |
| BLE_2M   | Ant1    | 2402      | Reference          | -0.11             | -0.11       | ---        | PASS    |
|          |         |           | 30~1000            | -0.11             | -68.2       | ≤-20.11    | PASS    |
|          |         |           | 1000~26500         | -0.11             | -42.9       | ≤-20.11    | PASS    |
|          |         | 2440      | Reference          | -0.34             | -0.34       | ---        | PASS    |
|          |         |           | 30~1000            | -0.34             | -67.82      | ≤-20.34    | PASS    |
|          |         |           | 1000~26500         | -0.34             | -41.61      | ≤-20.34    | PASS    |
|          |         | 2480      | Reference          | -1.87             | -1.87       | ---        | PASS    |
|          |         |           | 30~1000            | -1.87             | -67.55      | ≤-21.87    | PASS    |
|          |         |           | 1000~26500         | -1.87             | -42.43      | ≤-21.87    | PASS    |

## Test Graphs

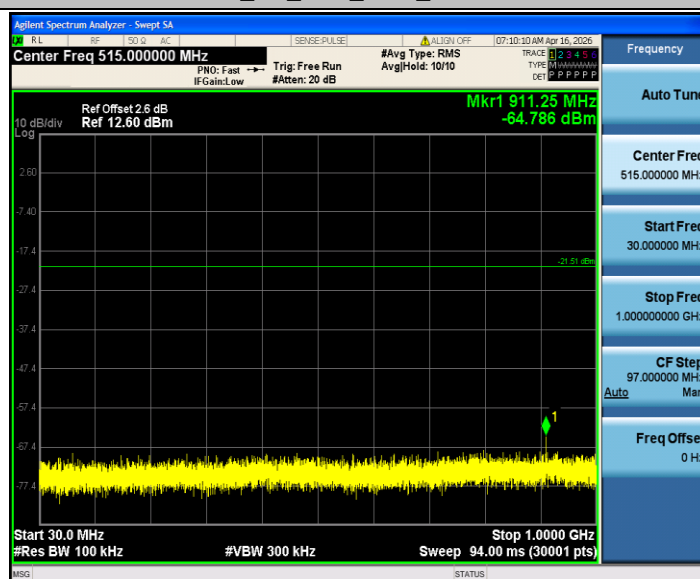




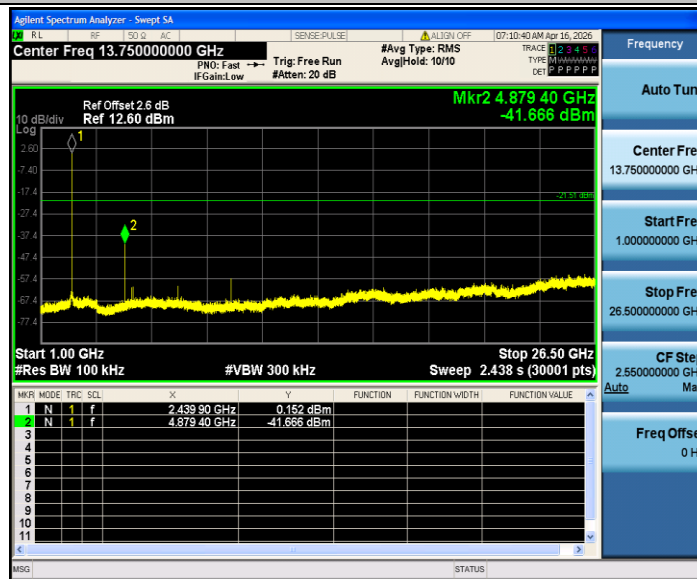
BLE\_1M\_Ant1\_2440\_0~Reference



BLE\_1M\_Ant1\_2440\_30~1000



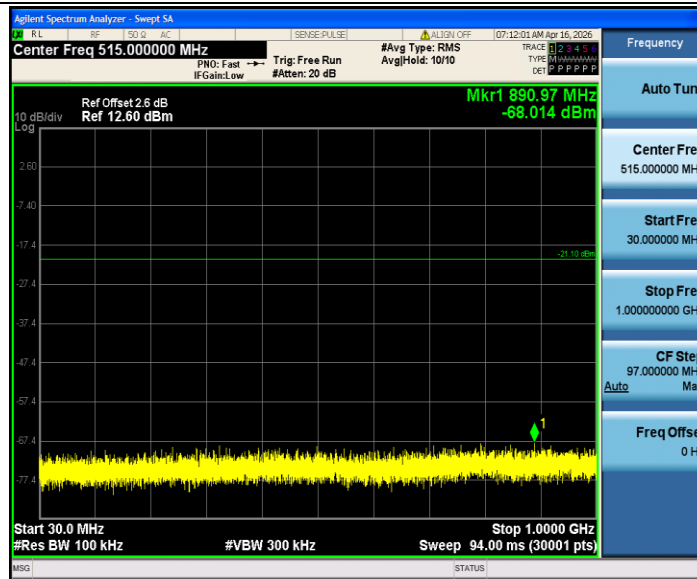
# BLE\_1M\_Ant1\_2440\_1000~26500



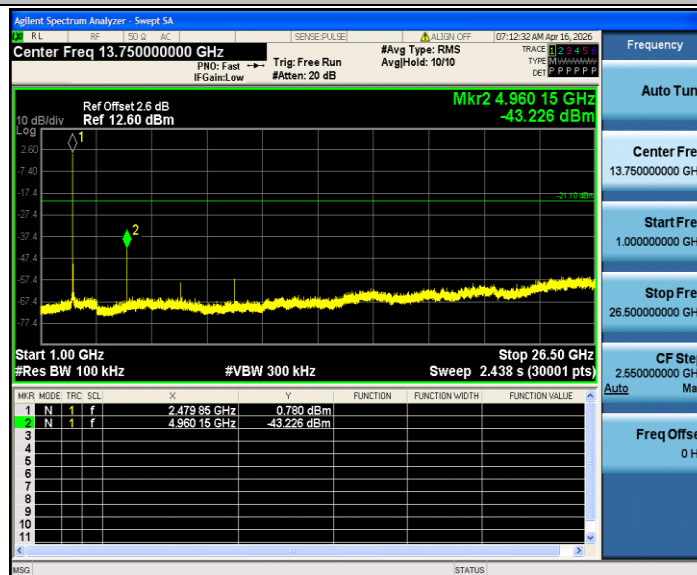
# BLE\_1M\_Ant1\_2480\_0~Reference



# BLE\_1M\_Ant1\_2480\_30~1000



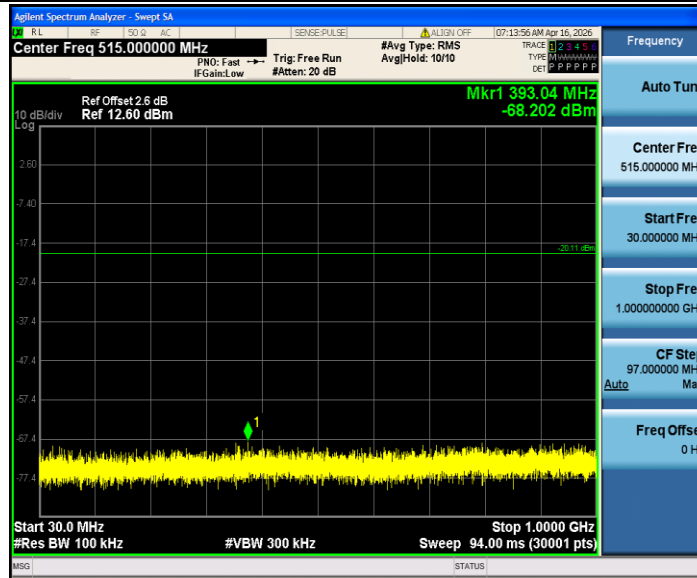
BLE\_1M\_Ant1\_2480\_1000~26500



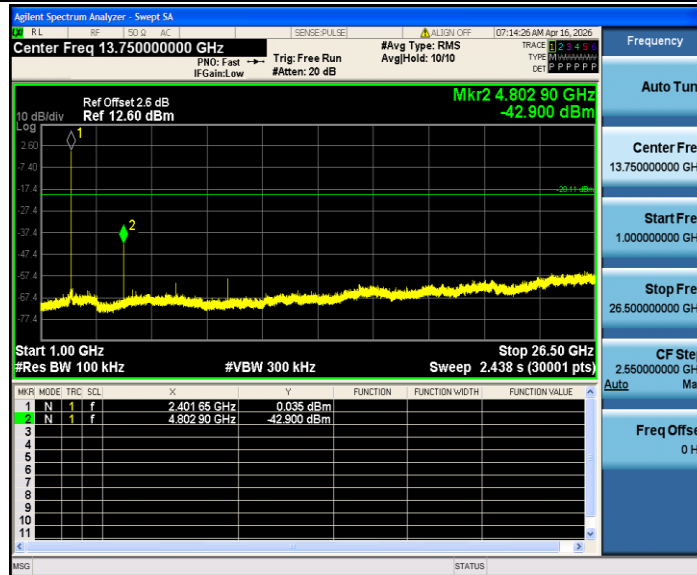
BLE\_2M\_Ant1\_2402\_0~Reference



# BLE\_2M\_Ant1\_2402\_30~1000



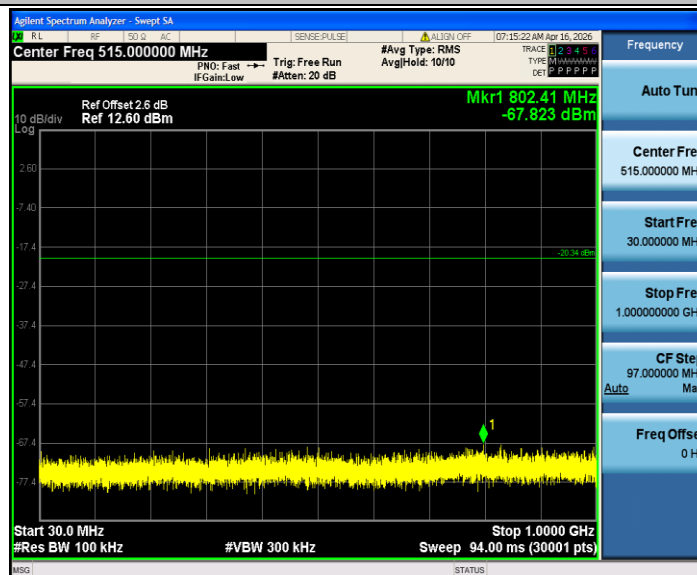
# BLE\_2M\_Ant1\_2402\_1000~26500



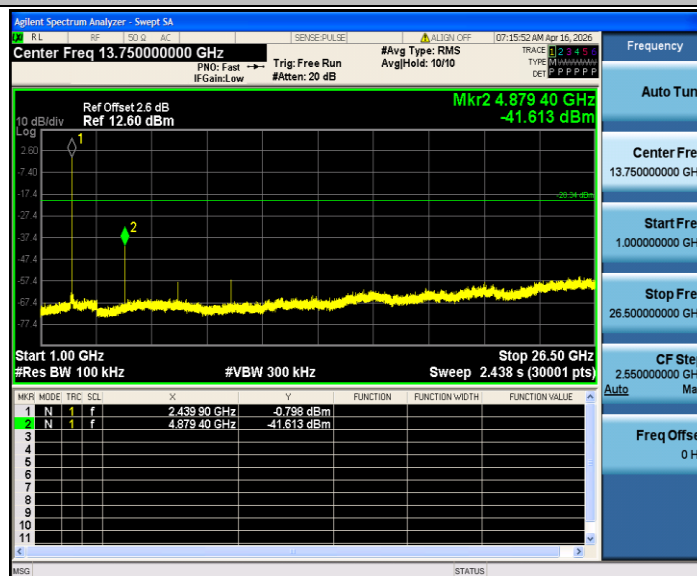
# BLE\_2M\_Ant1\_2440\_0~Reference



BLE\_2M\_Ant1\_2440\_30~1000



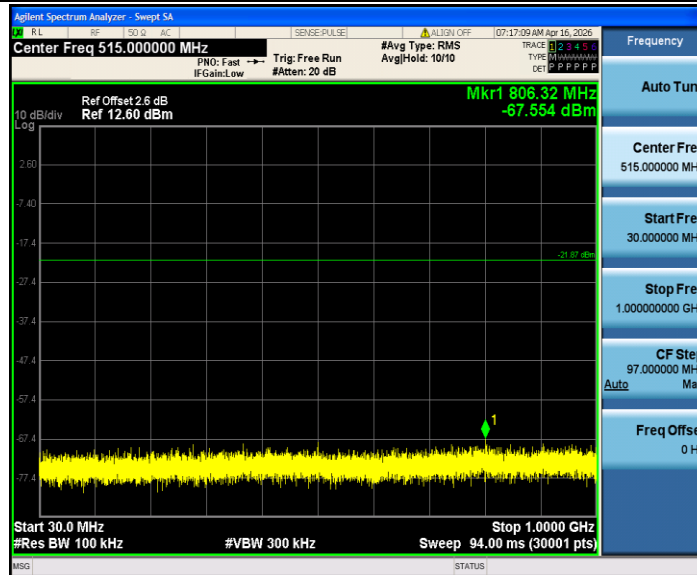
BLE\_2M\_Ant1\_2440\_1000~26500



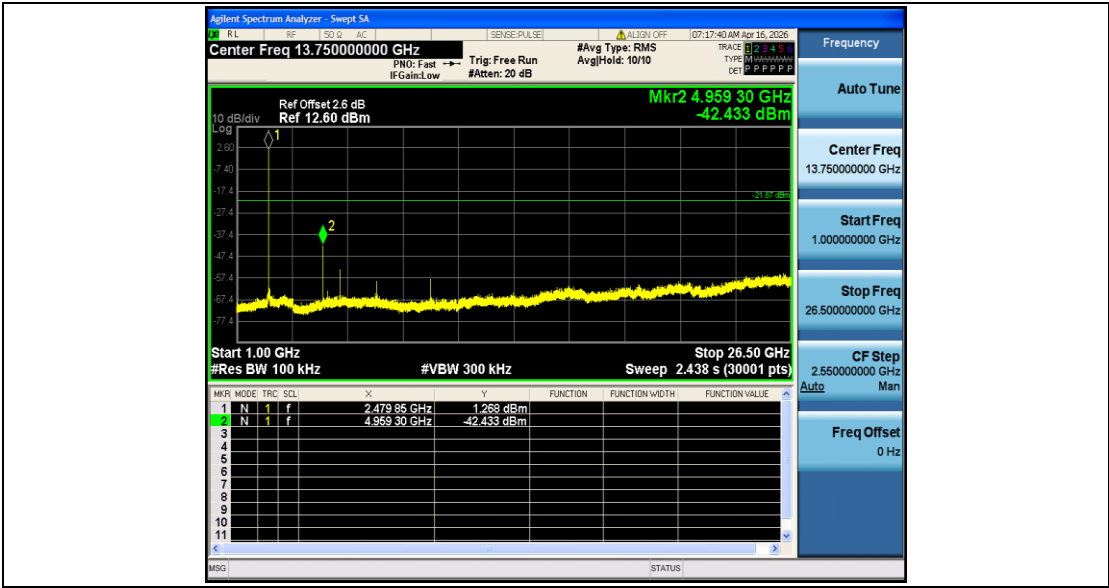
# BLE\_2M\_Ant1\_2480\_0~Reference



# BLE\_2M\_Ant1\_2480\_30~1000



# BLE\_2M\_Ant1\_2480\_1000~26500

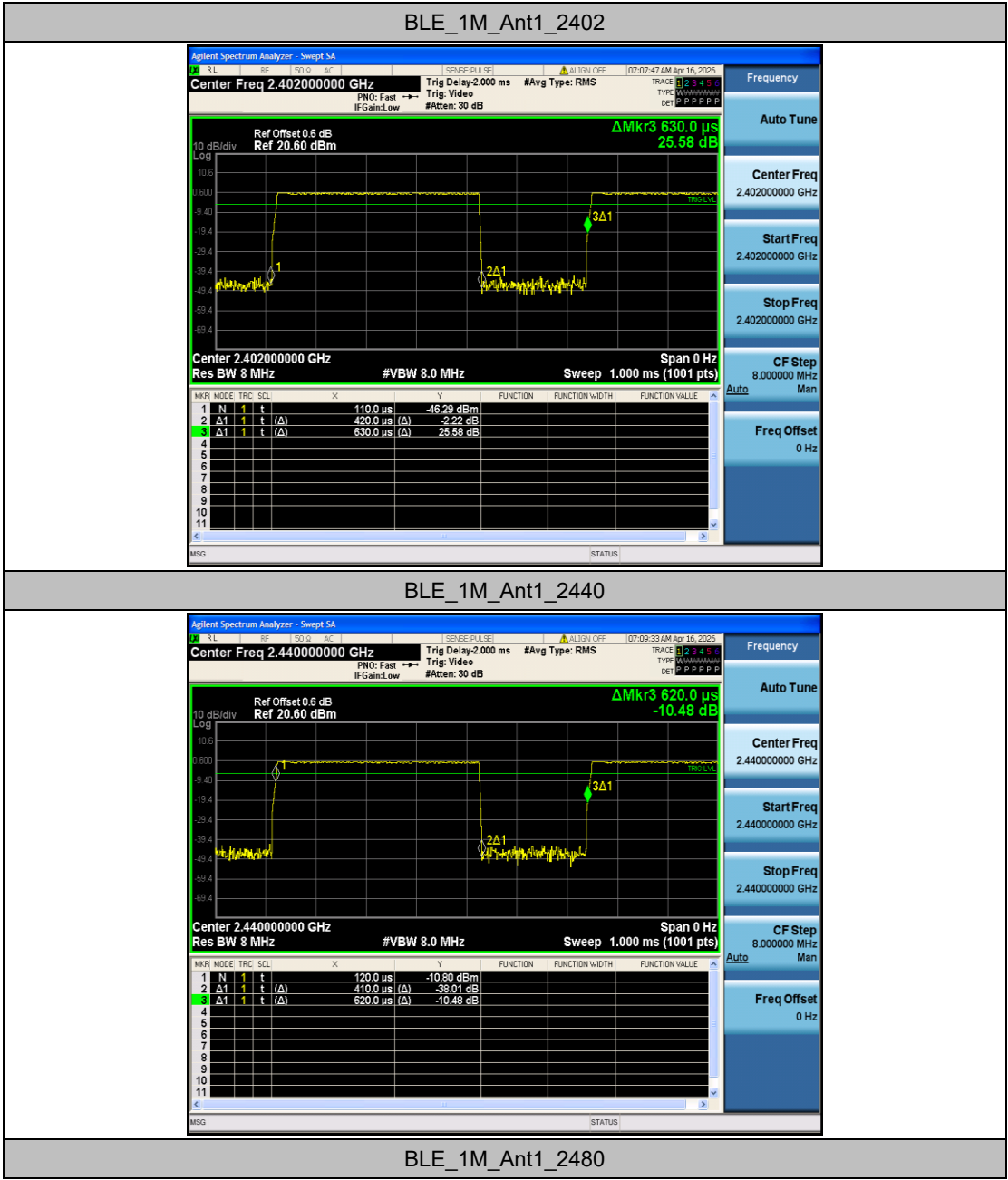


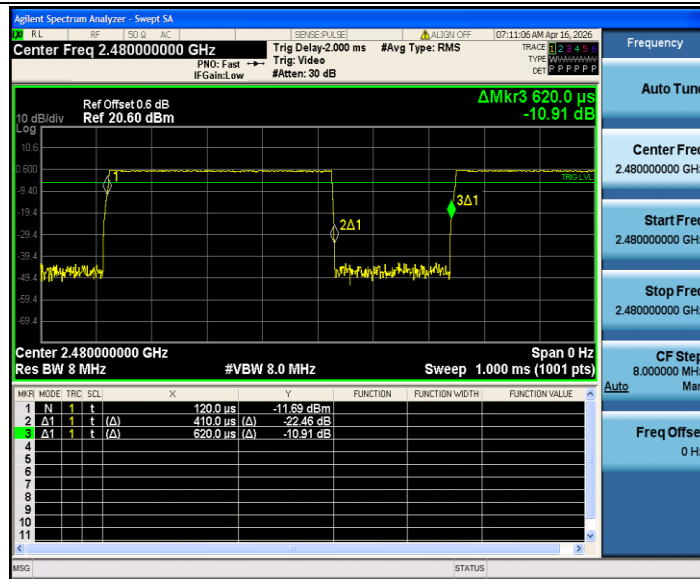
## Appendix G: Duty Cycle

### Test Result

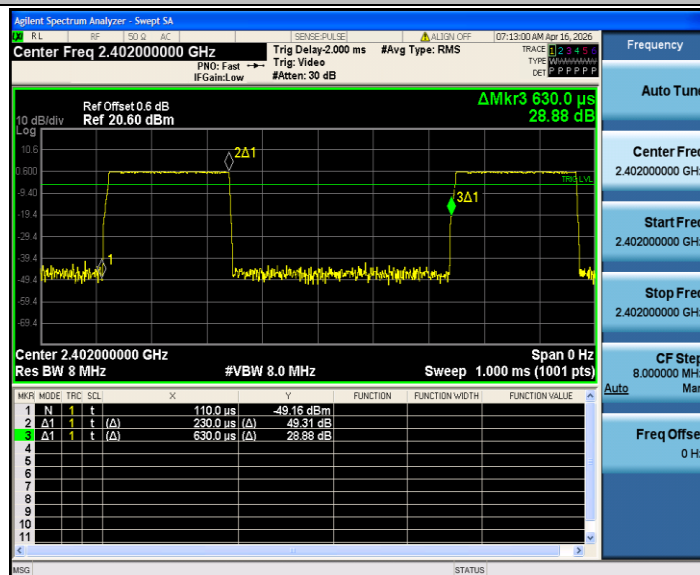
| TestMode | Antenna | Freq(MHz) | ON Time<br>[ms] | Period<br>[ms] | X      | DC<br>[%] | xFactor | Limit | Verdict |
|----------|---------|-----------|-----------------|----------------|--------|-----------|---------|-------|---------|
| BLE_1M   | Ant1    | 2402      | 0.42            | 0.63           | 0.6667 | 66.67     | 1.76    | ---   | ---     |
|          |         | 2440      | 0.41            | 0.62           | 0.6613 | 66.13     | 1.80    | ---   | ---     |
|          |         | 2480      | 0.41            | 0.62           | 0.6613 | 66.13     | 1.80    | ---   | ---     |
| BLE_2M   | Ant1    | 2402      | 0.23            | 0.63           | 0.3651 | 36.51     | 4.38    | ---   | ---     |
|          |         | 2440      | 0.23            | 0.63           | 0.3651 | 36.51     | 4.38    | ---   | ---     |
|          |         | 2480      | 0.22            | 0.62           | 0.3548 | 35.48     | 4.50    | ---   | ---     |

# Test Graphs

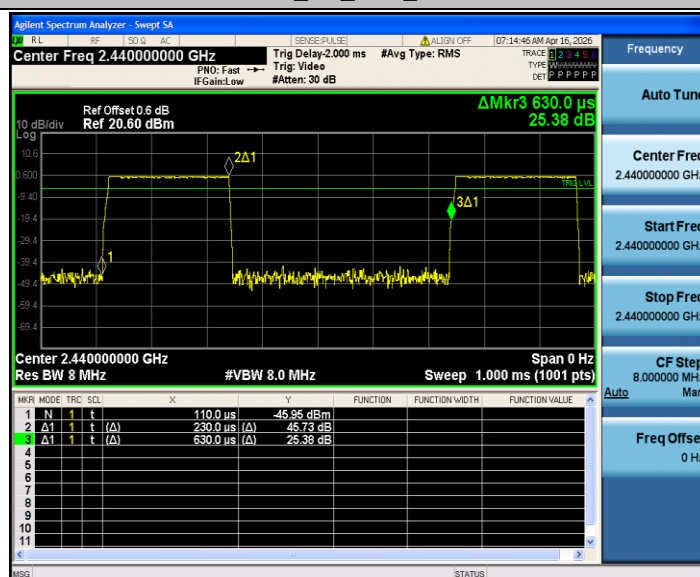




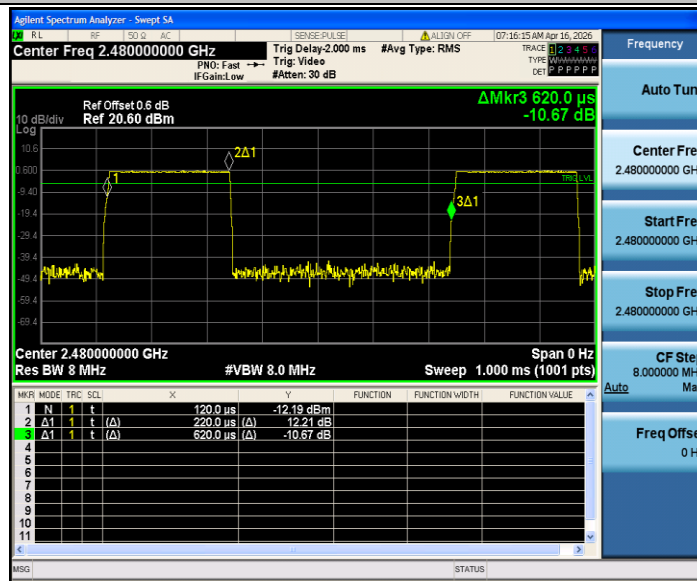
BLE\_2M\_Ant1\_2402



BLE\_2M\_Ant1\_2440



# BLE\_2M\_Ant1\_2480



## Appendix H: Emissions in Restricted Bands

### Test Result

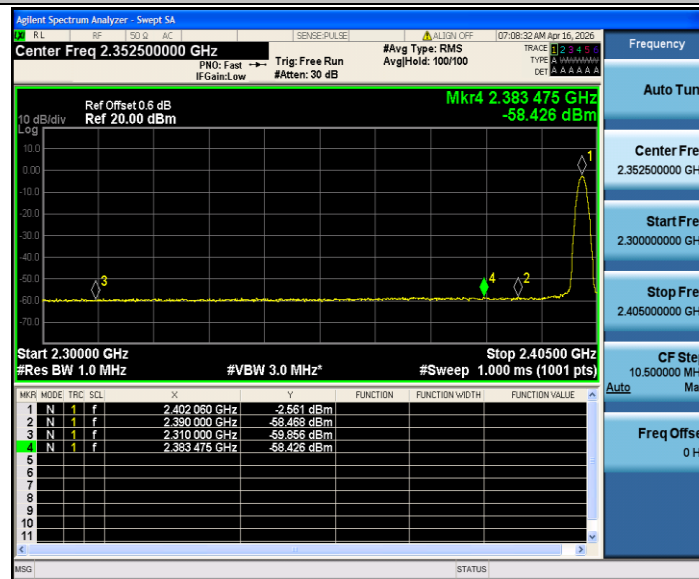
| TestMode | Antenna | ChName | Freq(MHz) | Detector | Freq [MHz] | Result [dBm] | Gain [dB] | DC Factor [dB] | Result [dBuV/m] | Limit [dBuV/m] | Verdict |
|----------|---------|--------|-----------|----------|------------|--------------|-----------|----------------|-----------------|----------------|---------|
| BLE_1M   | Ant1    | Low    | 2402      | AV       | 2310.000   | -59.86       | 3.71      | 1.76           | 40.81           | ≤54            | PASS    |
|          |         |        |           | AV       | 2383.475   | -58.43       | 3.71      | 1.76           | 42.24           | ≤54            | PASS    |
|          |         |        |           | AV       | 2390.000   | -58.47       | 3.71      | 1.76           | 42.2            | ≤54            | PASS    |
|          |         |        |           | Peak     | 2310.000   | -50.13       | 3.71      | 0.00           | 48.78           | ≤74            | PASS    |
|          |         |        |           | Peak     | 2375.285   | -48.77       | 3.71      | 0.00           | 50.14           | ≤74            | PASS    |
|          |         |        |           | Peak     | 2390.000   | -50.94       | 3.71      | 0.00           | 47.97           | ≤74            | PASS    |
|          |         | High   | 2480      | AV       | 2483.500   | -57.83       | 3.71      | 1.80           | 42.88           | ≤54            | PASS    |
|          |         |        |           | AV       | 2483.840   | -57.3        | 3.71      | 1.80           | 43.41           | ≤54            | PASS    |
|          |         |        |           | AV       | 2500.000   | -58.97       | 3.71      | 1.80           | 41.74           | ≤54            | PASS    |
|          |         |        |           | Peak     | 2483.500   | -49.31       | 3.71      | 0.00           | 49.6            | ≤74            | PASS    |
|          |         |        |           | Peak     | 2484.160   | -44.74       | 3.71      | 0.00           | 54.17           | ≤74            | PASS    |
|          |         |        |           | Peak     | 2500.000   | -50.73       | 3.71      | 0.00           | 48.18           | ≤74            | PASS    |
| BLE_2M   | Ant1    | Low    | 2402      | AV       | 2310.000   | -59.7        | 3.71      | 4.38           | 43.59           | ≤54            | PASS    |
|          |         |        |           | AV       | 2387.150   | -58.82       | 3.71      | 4.38           | 44.47           | ≤54            | PASS    |
|          |         |        |           | AV       | 2390.000   | -59.67       | 3.71      | 4.38           | 43.62           | ≤54            | PASS    |
|          |         |        |           | Peak     | 2310.000   | -53.24       | 3.71      | 0.00           | 45.67           | ≤74            | PASS    |
|          |         |        |           | Peak     | 2370.665   | -48.51       | 3.71      | 0.00           | 50.4            | ≤74            | PASS    |
|          |         |        |           | Peak     | 2390.000   | -50.45       | 3.71      | 0.00           | 48.46           | ≤74            | PASS    |
|          |         | High   | 2480      | AV       | 2483.500   | -57.18       | 3.71      | 4.50           | 46.23           | ≤54            | PASS    |
|          |         |        |           | AV       | 2483.520   | -57.18       | 3.71      | 4.50           | 46.23           | ≤54            | PASS    |
|          |         |        |           | AV       | 2500.000   | -58.79       | 3.71      | 4.50           | 44.62           | ≤54            | PASS    |
|          |         |        |           | Peak     | 2483.500   | -47.51       | 3.71      | 0.00           | 51.4            | ≤74            | PASS    |
|          |         |        |           | Peak     | 2484.640   | -42.66       | 3.71      | 0.00           | 56.25           | ≤74            | PASS    |
|          |         |        |           | Peak     | 2500.000   | -50.77       | 3.71      | 0.00           | 48.14           | ≤74            | PASS    |

Note:

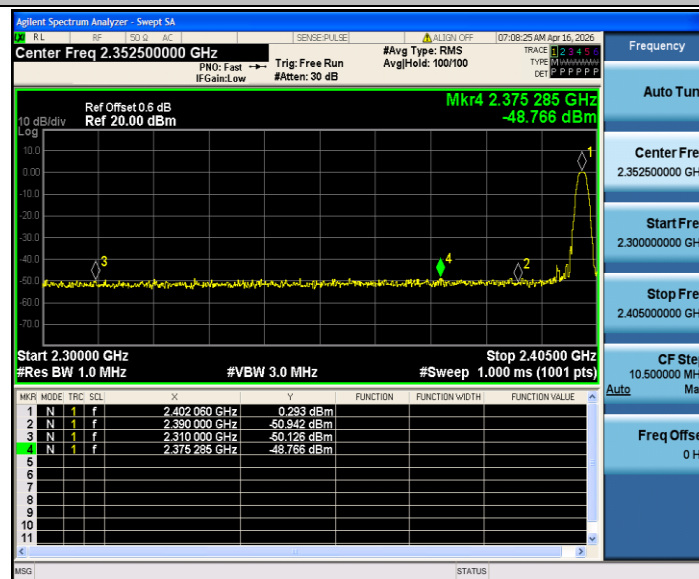
The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

## Test Graphs

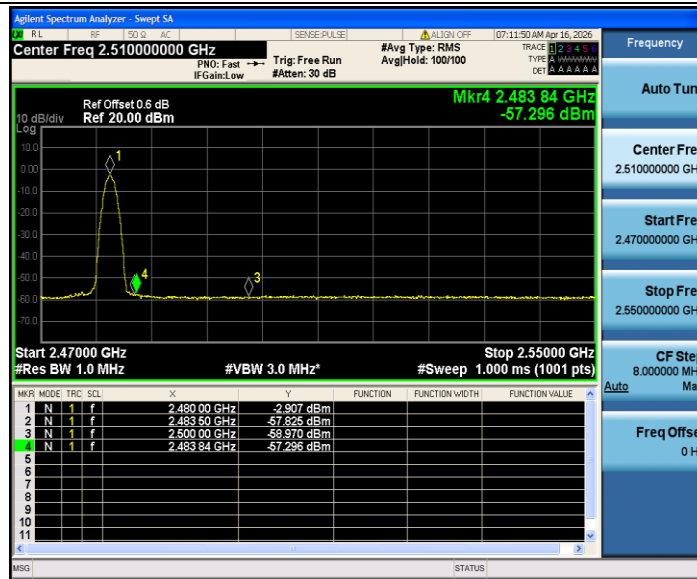
BLE\_1M\_Ant1\_Low\_2402\_AV



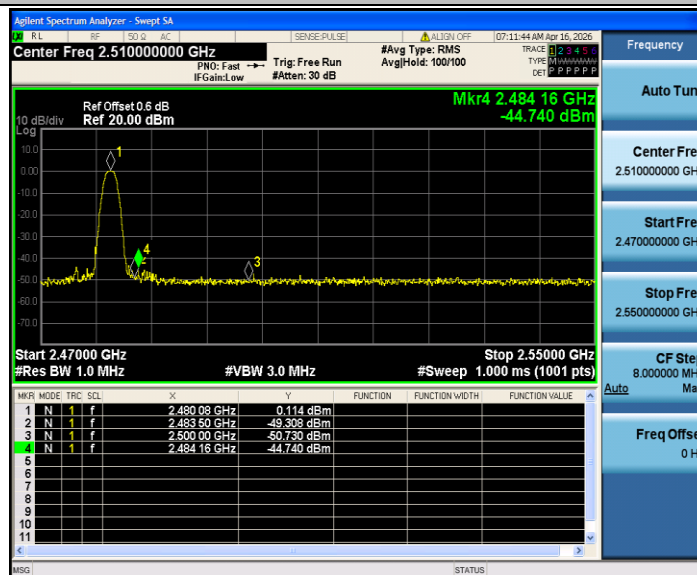
BLE\_1M\_Ant1\_Low\_2402\_Peak



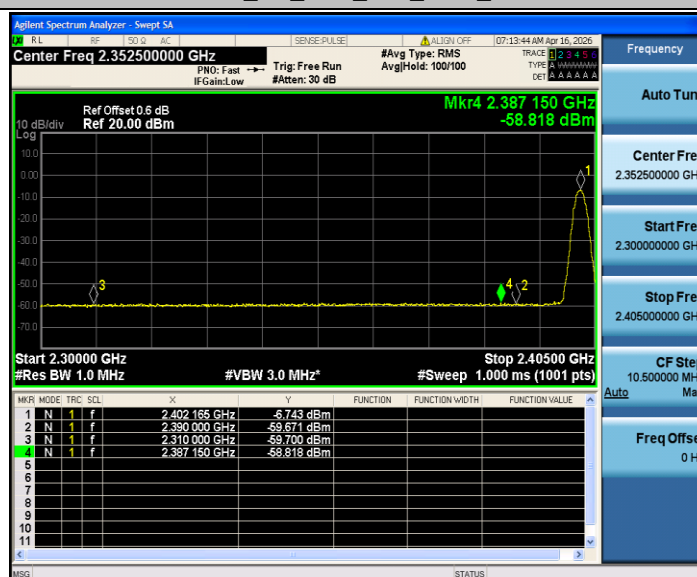
BLE\_1M\_Ant1\_High\_2480\_AV



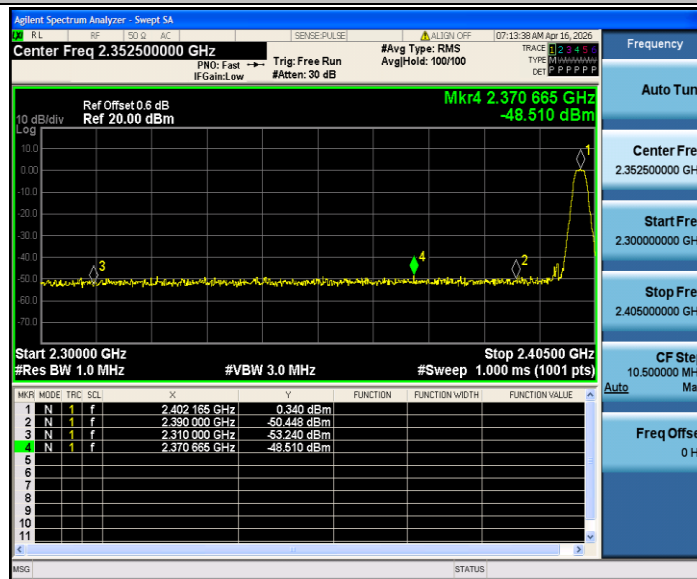
BLE\_1M\_Ant1\_High\_2480\_Peak



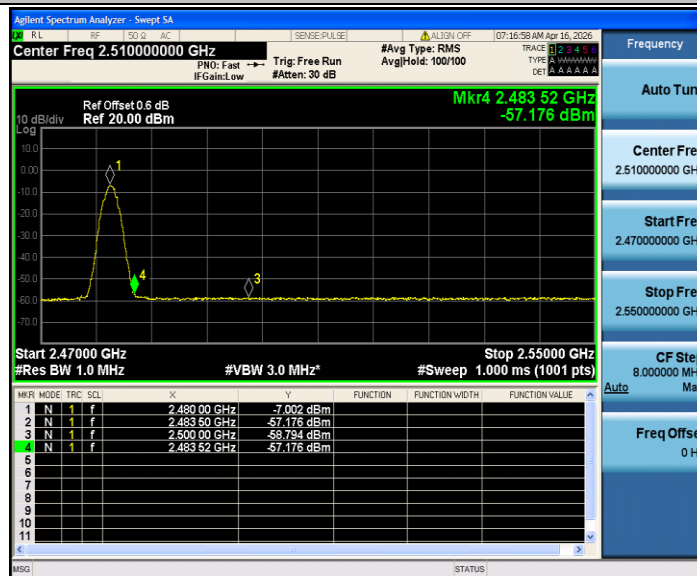
BLE\_2M\_Ant1\_Low\_2402\_AV



# BLE\_2M\_Ant1\_Low\_2402\_Peak



# BLE\_2M\_Ant1\_High\_2480\_AV



# BLE\_2M\_Ant1\_High\_2480\_Peak

