

## Appendix: Bluetooth LE

## Contents

|                                                  |    |
|--------------------------------------------------|----|
| Appendix A: DTS Bandwidth .....                  | 3  |
| Test Result .....                                | 3  |
| Test Graphs .....                                | 4  |
| Appendix B: Occupied Channel Bandwidth .....     | 6  |
| Test Result .....                                | 6  |
| Test Graphs .....                                | 7  |
| Appendix C: Maximum conducted output power ..... | 9  |
| Test Result Peak .....                           | 9  |
| Test Graphs Peak .....                           | 10 |
| Appendix D: Maximum power spectral density ..... | 12 |
| Test Result .....                                | 12 |
| Test Graphs .....                                | 13 |
| Appendix E: Band edge measurements .....         | 15 |
| Test Result .....                                | 15 |
| Test Graphs .....                                | 16 |
| Appendix F: Conducted Spurious Emission .....    | 17 |
| Test Result .....                                | 17 |
| Test Graphs .....                                | 18 |
| Appendix G: Duty Cycle .....                     | 23 |
| Test Result .....                                | 23 |
| Test Graphs .....                                | 24 |

**Appendix A: DTS Bandwidth****Test Result**

| Test Mode | Antenna | Frequency[MHz] | DTS BW [MHz] | FL[MHz]  | FH[MHz]  | Limit[MHz] | Verdict |
|-----------|---------|----------------|--------------|----------|----------|------------|---------|
| BLE_1M    | Ant1    | 2402           | 0.656        | 2401.692 | 2402.348 | 0.5        | PASS    |
|           |         | 2440           | 0.652        | 2439.696 | 2440.348 | 0.5        | PASS    |
|           |         | 2480           | 0.648        | 2479.696 | 2480.344 | 0.5        | PASS    |

## Test Graphs

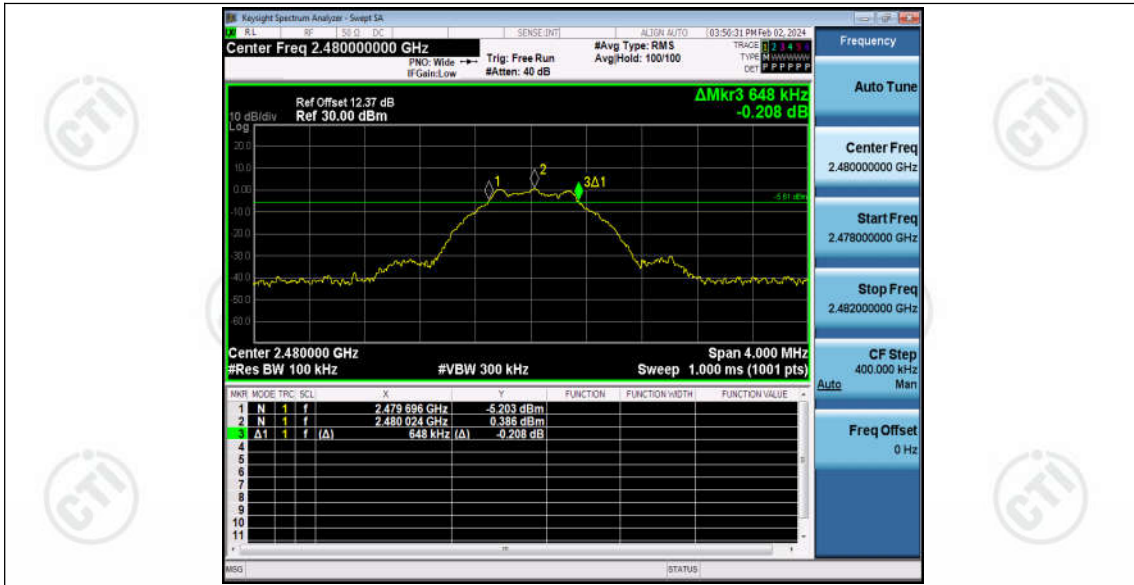
BLE\_1M\_Ant1\_2402



BLE\_1M\_Ant1\_2440



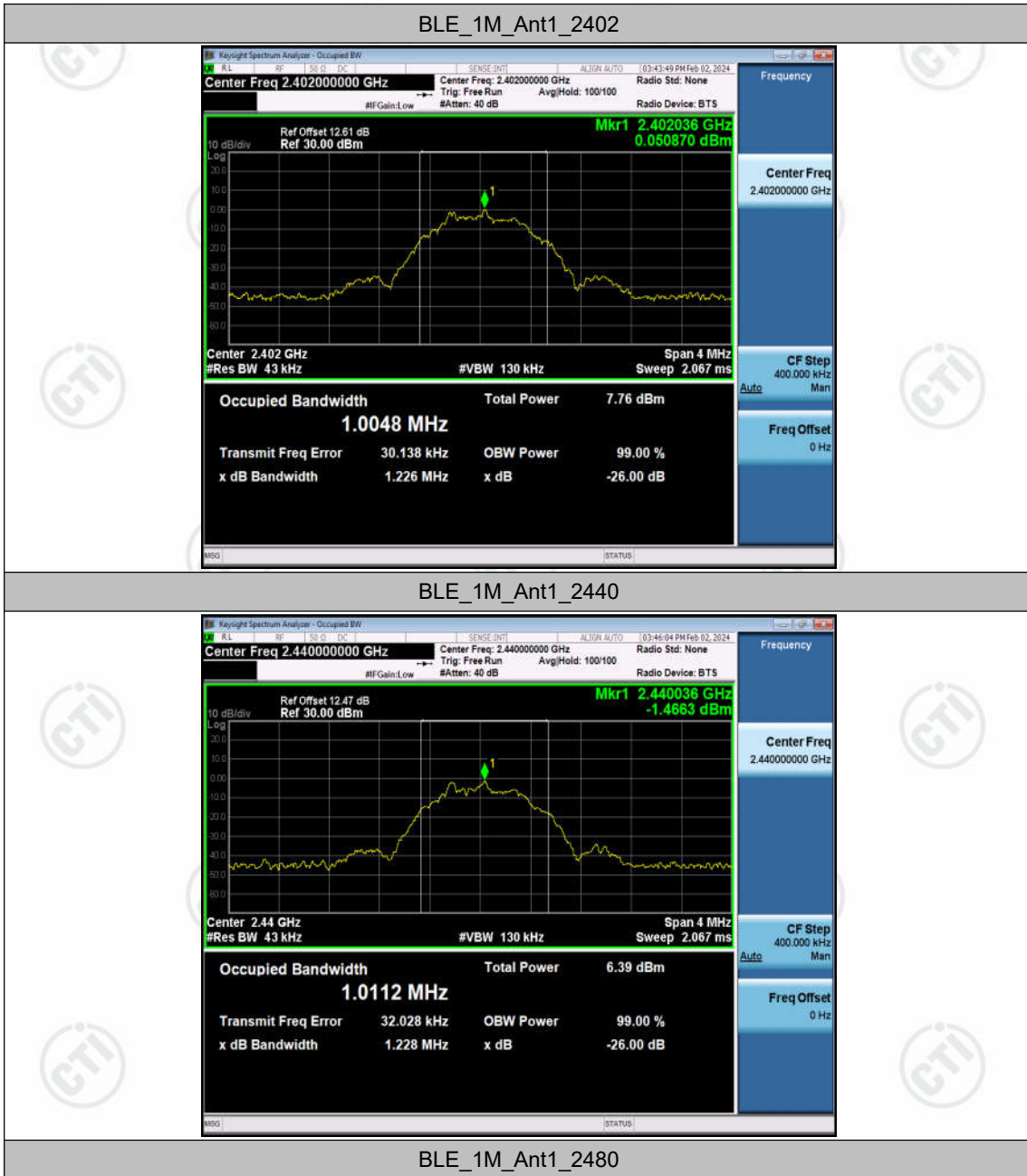
BLE\_1M\_Ant1\_2480



**Appendix B: Occupied Channel Bandwidth****Test Result**

| Test Mode | Antenna | Frequency[MHz] | OCB [MHz] | FL[MHz]   | FH[MHz]   | Limit[MHz] | Verdict |
|-----------|---------|----------------|-----------|-----------|-----------|------------|---------|
| BLE_1M    | Ant1    | 2402           | 1.0048    | 2401.5277 | 2402.5325 | ---        | ---     |
|           |         | 2440           | 1.0112    | 2439.5264 | 2440.5376 | ---        | ---     |
|           |         | 2480           | 1.0004    | 2479.5305 | 2480.5309 | ---        | ---     |

## Test Graphs



BLE\_1M\_Ant1\_2480

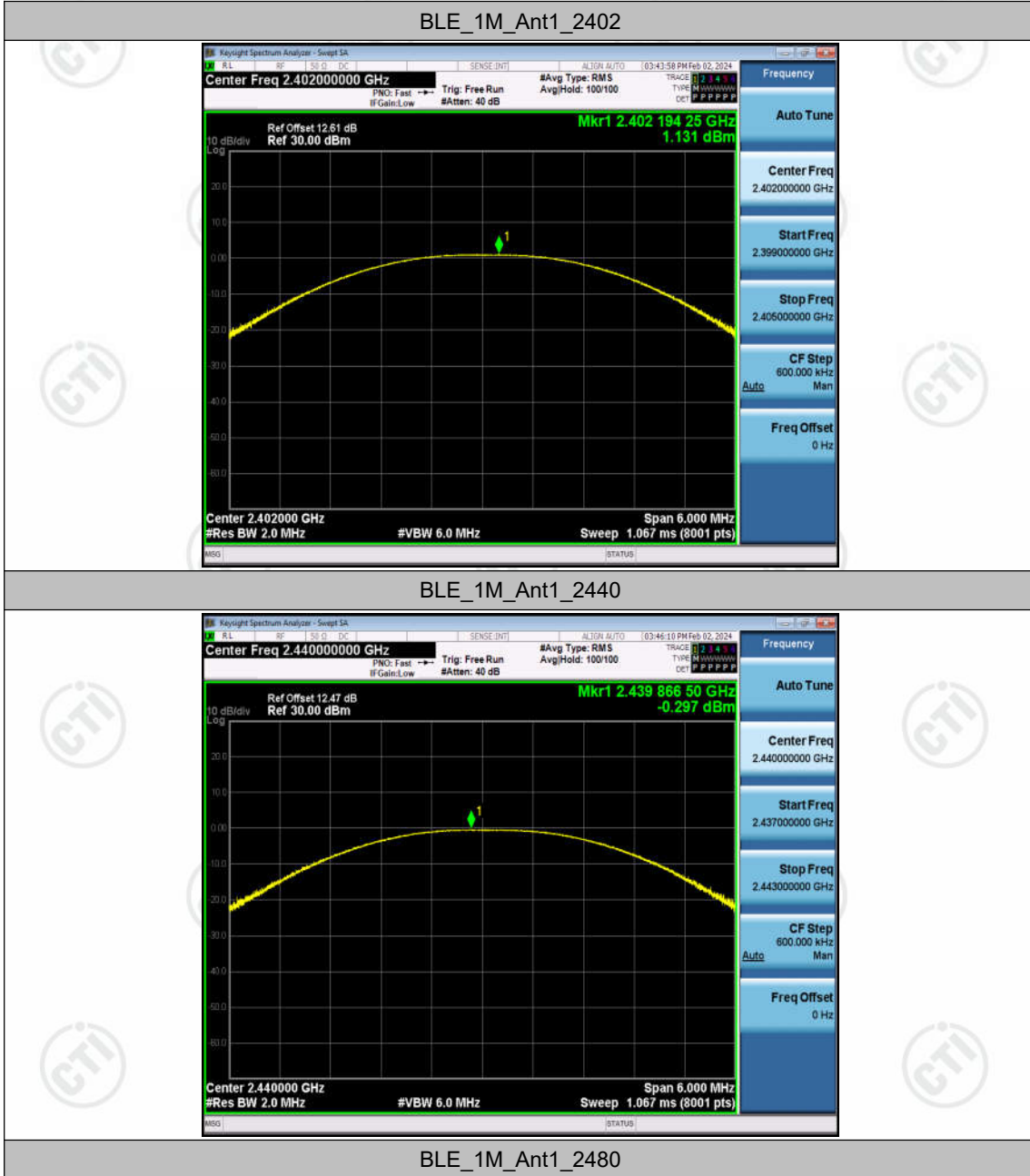


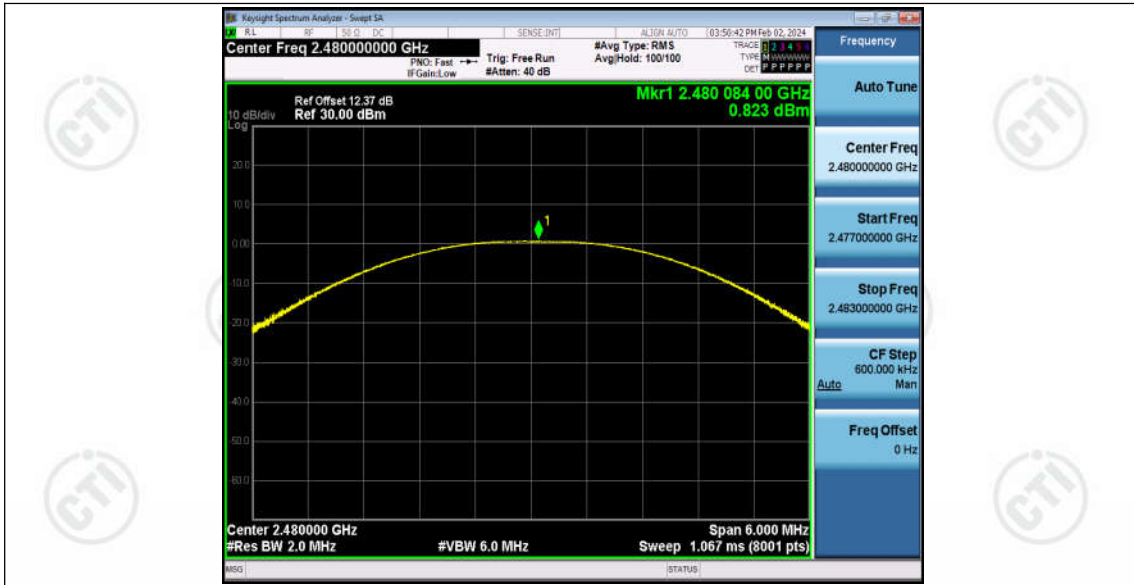


**Appendix C: Maximum conducted output power****Test Result Peak**

| Test Mode | Antenna | Frequency[MHz] | Conducted Peak Power[dBm] | Conducted Limit[dBm] | Verdict |
|-----------|---------|----------------|---------------------------|----------------------|---------|
| BLE_1M    | Ant1    | 2402           | 1.13                      | ≤30                  | PASS    |
|           |         | 2440           | -0.3                      | ≤30                  | PASS    |
|           |         | 2480           | 0.82                      | ≤30                  | PASS    |

## Test Graphs Peak

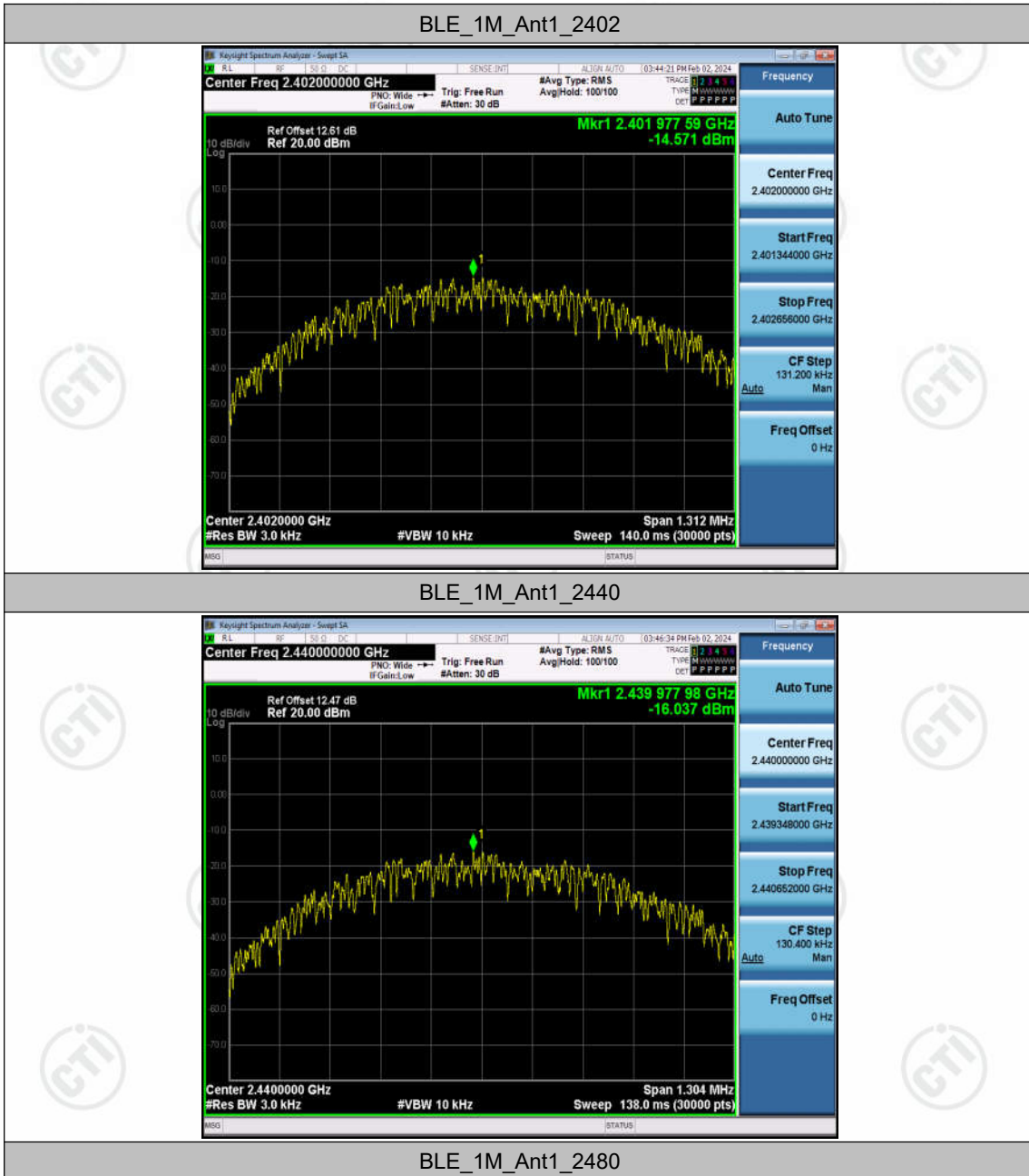




**Appendix D: Maximum power spectral density****Test Result**

| Test Mode | Antenna | Frequency[MHz] | Result[dBm/3kHz] | Limit[dBm/3kHz] | Verdict |
|-----------|---------|----------------|------------------|-----------------|---------|
| BLE_1M    | Ant1    | 2402           | -14.57           | ≤8.00           | PASS    |
|           |         | 2440           | -16.04           | ≤8.00           | PASS    |
|           |         | 2480           | -14.94           | ≤8.00           | PASS    |

## Test Graphs

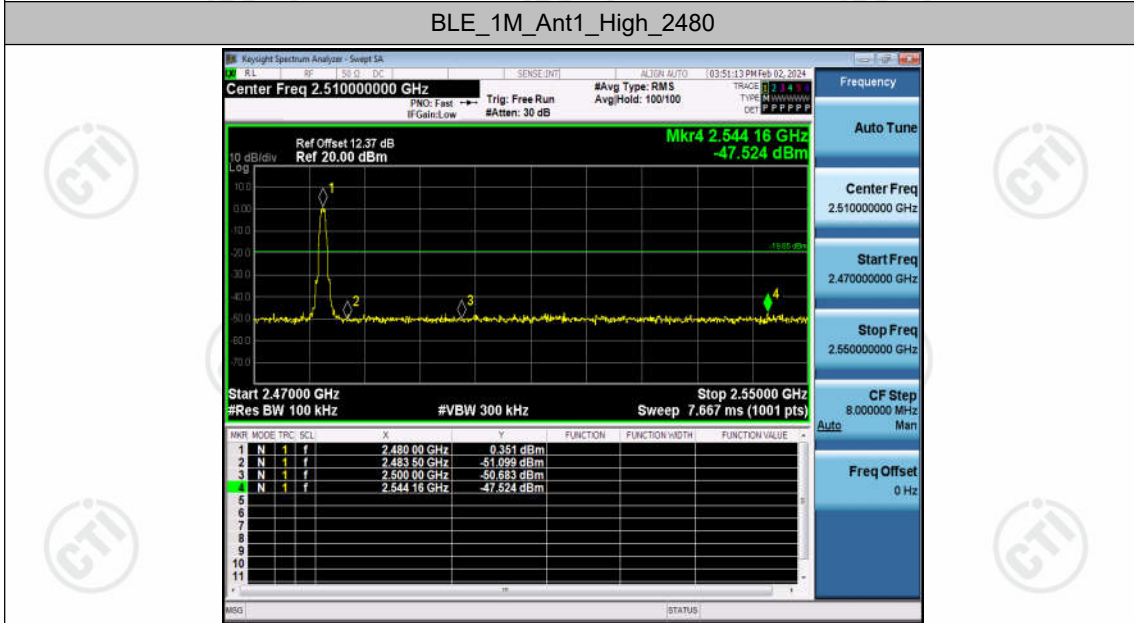
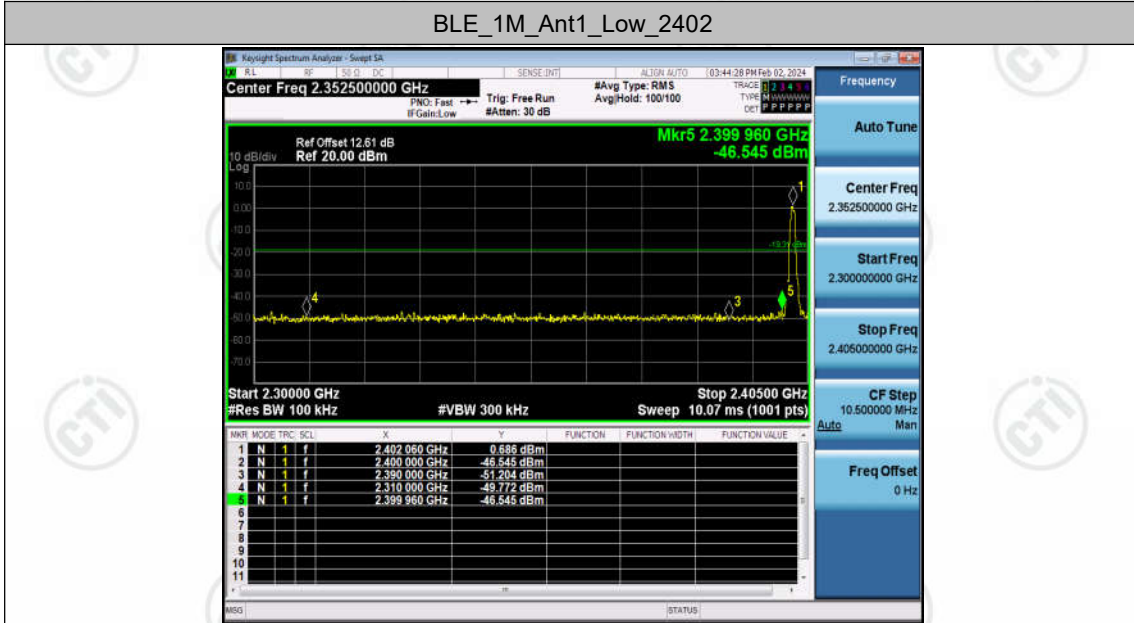




**Appendix E: Band edge measurements****Test Result**

| Test Mode | Antenna | ChName | Frequency[MHz] | RefLevel[dBm] | Result[dBm] | Limit[dBm] | Verdict |
|-----------|---------|--------|----------------|---------------|-------------|------------|---------|
| BLE_1M    | Ant1    | Low    | 2402           | 0.69          | -46.55      | ≤-19.31    | PASS    |
|           |         | High   | 2480           | 0.35          | -47.52      | ≤-19.65    | PASS    |

## Test Graphs



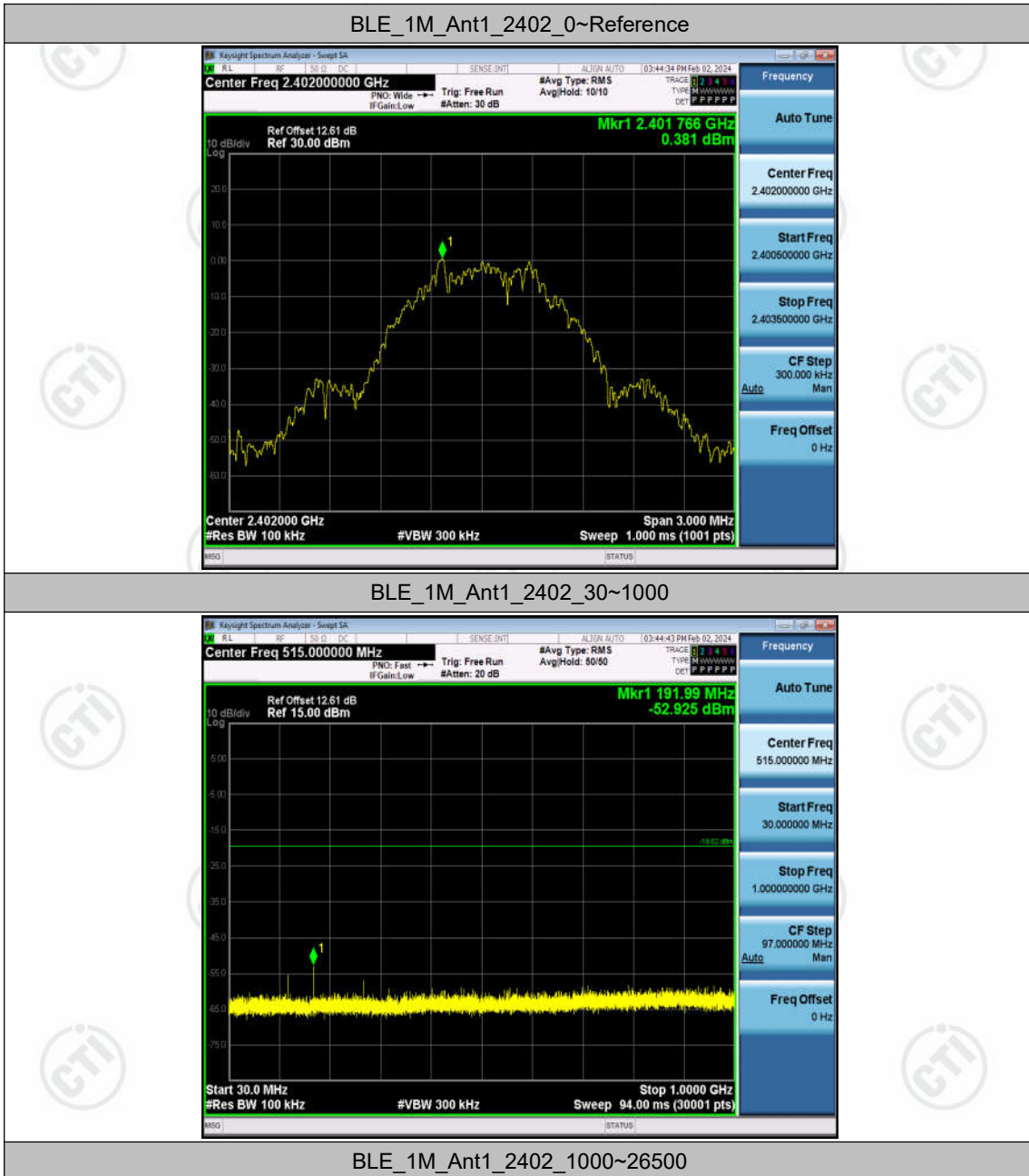


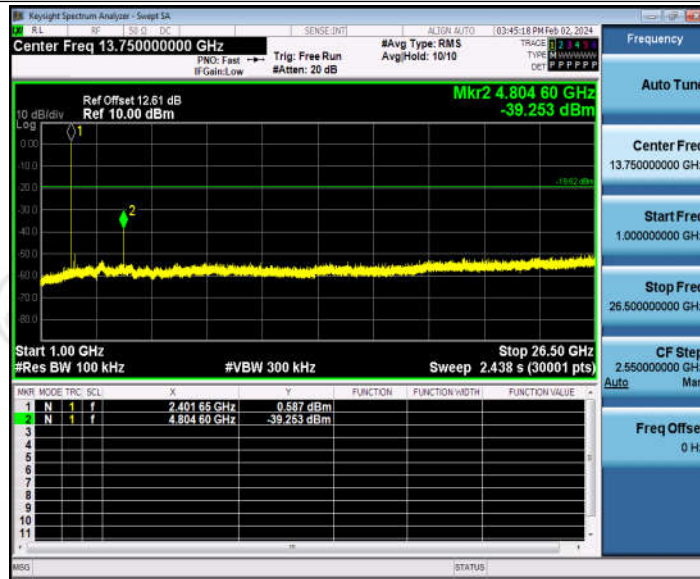
## Appendix F: Conducted Spurious Emission

### Test Result

| Test Mode | Antenna | Frequency [MHz] | FreqRange [MHz] | RefLevel [dBm] | Result[dBm] | Limit[dBm] | Verdict |
|-----------|---------|-----------------|-----------------|----------------|-------------|------------|---------|
| BLE_1M    | Ant1    | 2402            | Reference       | 0.38           | 0.38        | ---        | PASS    |
|           |         |                 | 30~1000         | 0.38           | -52.93      | ≤-19.62    | PASS    |
|           |         |                 | 1000~26500      | 0.38           | -39.25      | ≤-19.62    | PASS    |
|           |         | 2440            | Reference       | -1.65          | -1.65       | ---        | PASS    |
|           |         |                 | 30~1000         | -1.65          | -53.31      | ≤-21.65    | PASS    |
|           |         |                 | 1000~26500      | -1.65          | -39.46      | ≤-21.65    | PASS    |
|           |         | 2480            | Reference       | -0.45          | -0.45       | ---        | PASS    |
|           |         |                 | 30~1000         | -0.45          | -53.78      | ≤-20.45    | PASS    |
|           |         |                 | 1000~26500      | -0.45          | -35.07      | ≤-20.45    | PASS    |

## Test Graphs

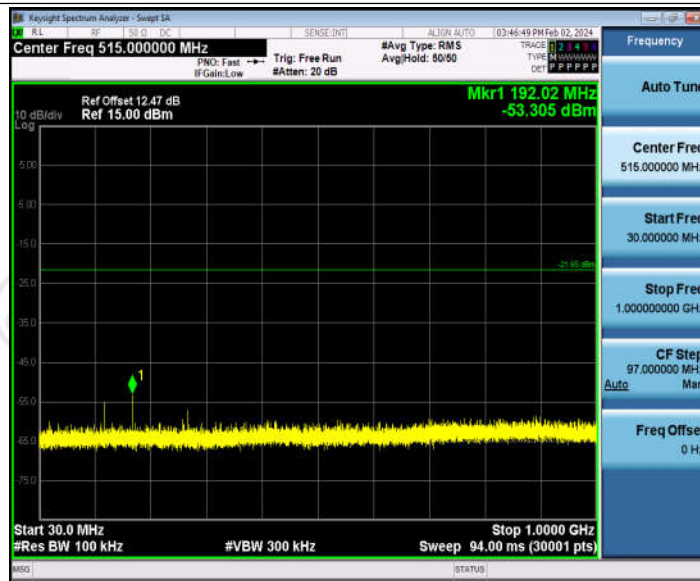




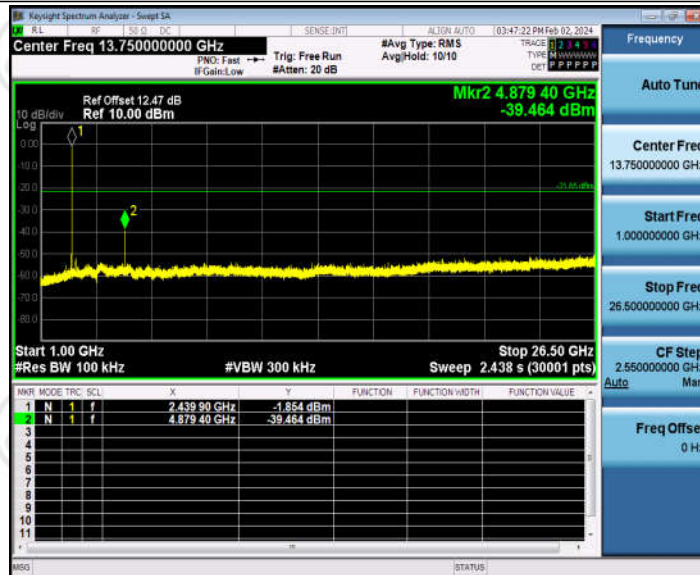
BLE\_1M\_Ant1\_2440\_0~Reference



BLE\_1M\_Ant1\_2440\_30~1000



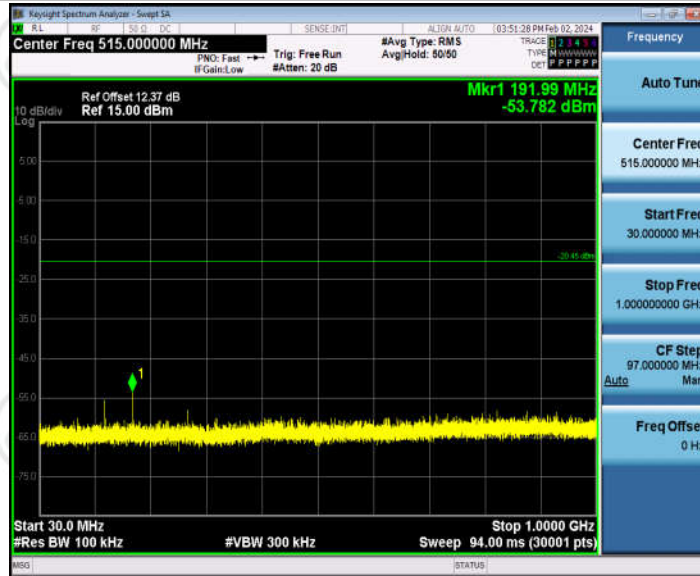
BLE\_1M\_Ant1\_2440\_1000~26500



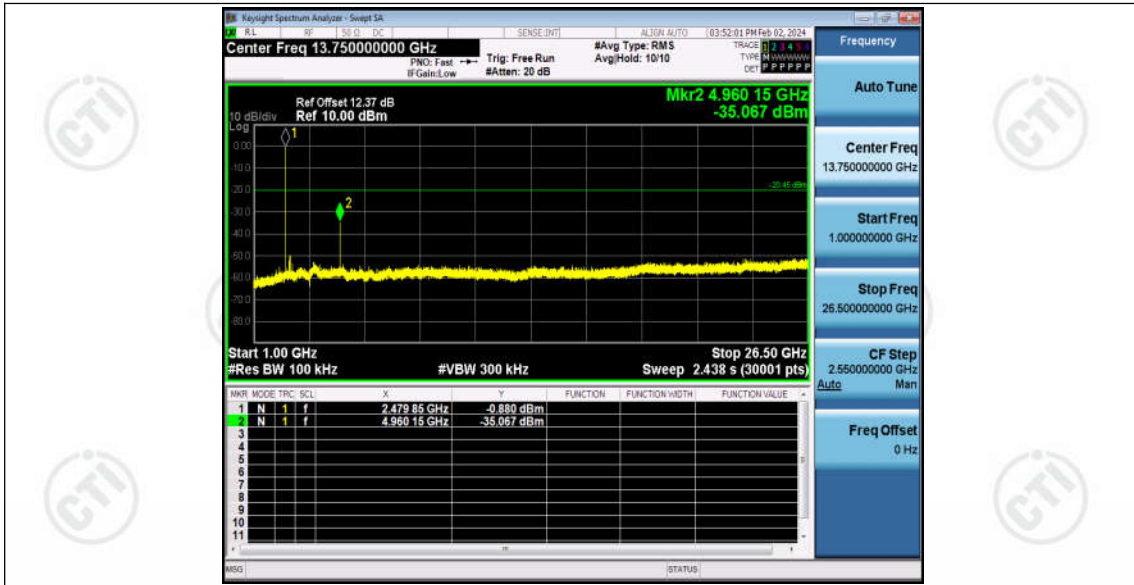
BLE\_1M\_Ant1\_2480\_0~Reference



BLE\_1M\_Ant1\_2480\_30~1000



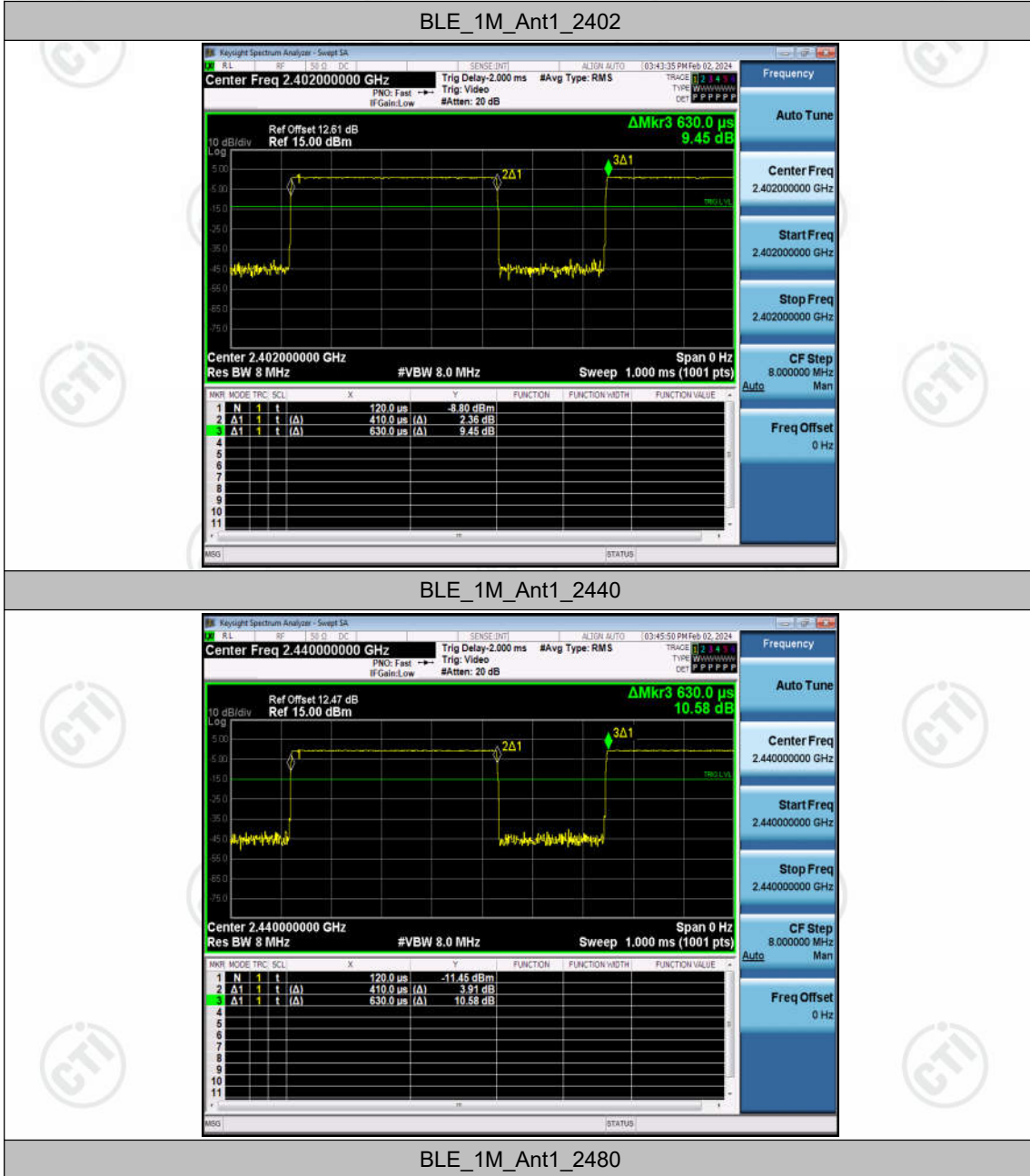
BLE\_1M\_Ant1\_2480\_1000~26500



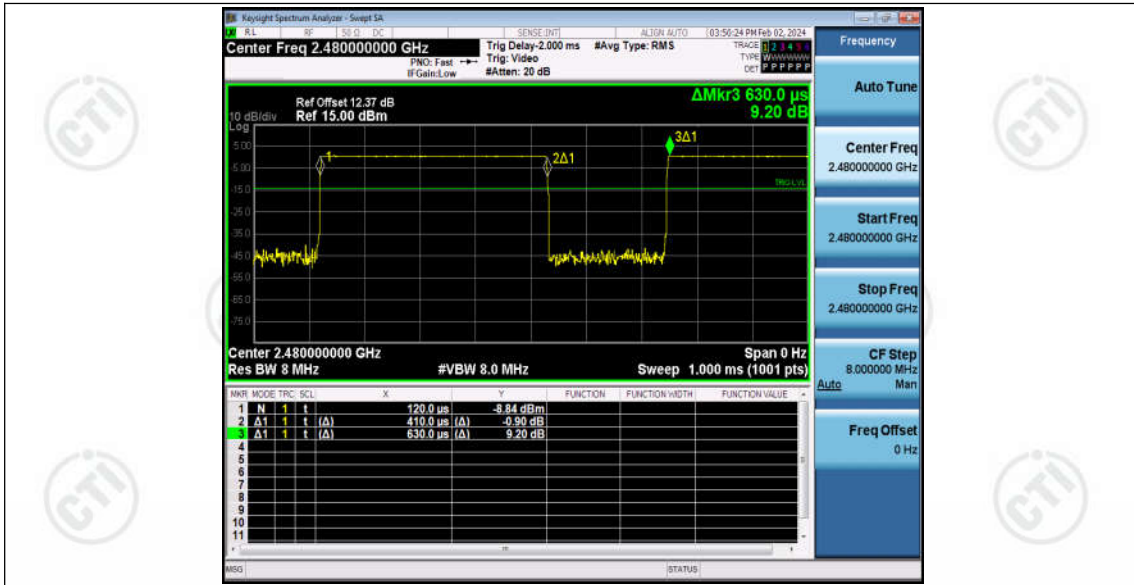
**Appendix G: Duty Cycle****Test Result**

| Test Mode | Antenna | Frequency [MHz] | ON Time [ms] | Period [ms] | Duty Cycle [%] | Duty Cycle Factor[dB] |
|-----------|---------|-----------------|--------------|-------------|----------------|-----------------------|
| BLE_1M    | Ant1    | 2402            | 0.41         | 0.63        | 65.08          | 1.87                  |
|           |         | 2440            | 0.41         | 0.63        | 65.08          | 1.87                  |
|           |         | 2480            | 0.41         | 0.63        | 65.08          | 1.87                  |

## Test Graphs







\*\*\* End of Report \*\*\*