



## Appendix A

### RF Test Data for BLE (Conducted Measurement)

Product Name: Egg biomarker sensor

Test Model: E20125

#### Environmental Conditions

|                    |                  |
|--------------------|------------------|
| Temperature:       | 21.1 ° C         |
| Relative Humidity: | 52.2%            |
| ATM Pressure:      | 100.0 kPa        |
| Test Engineer:     | <i>Mark Chen</i> |
| Supervised by:     | <i>Libin</i>     |

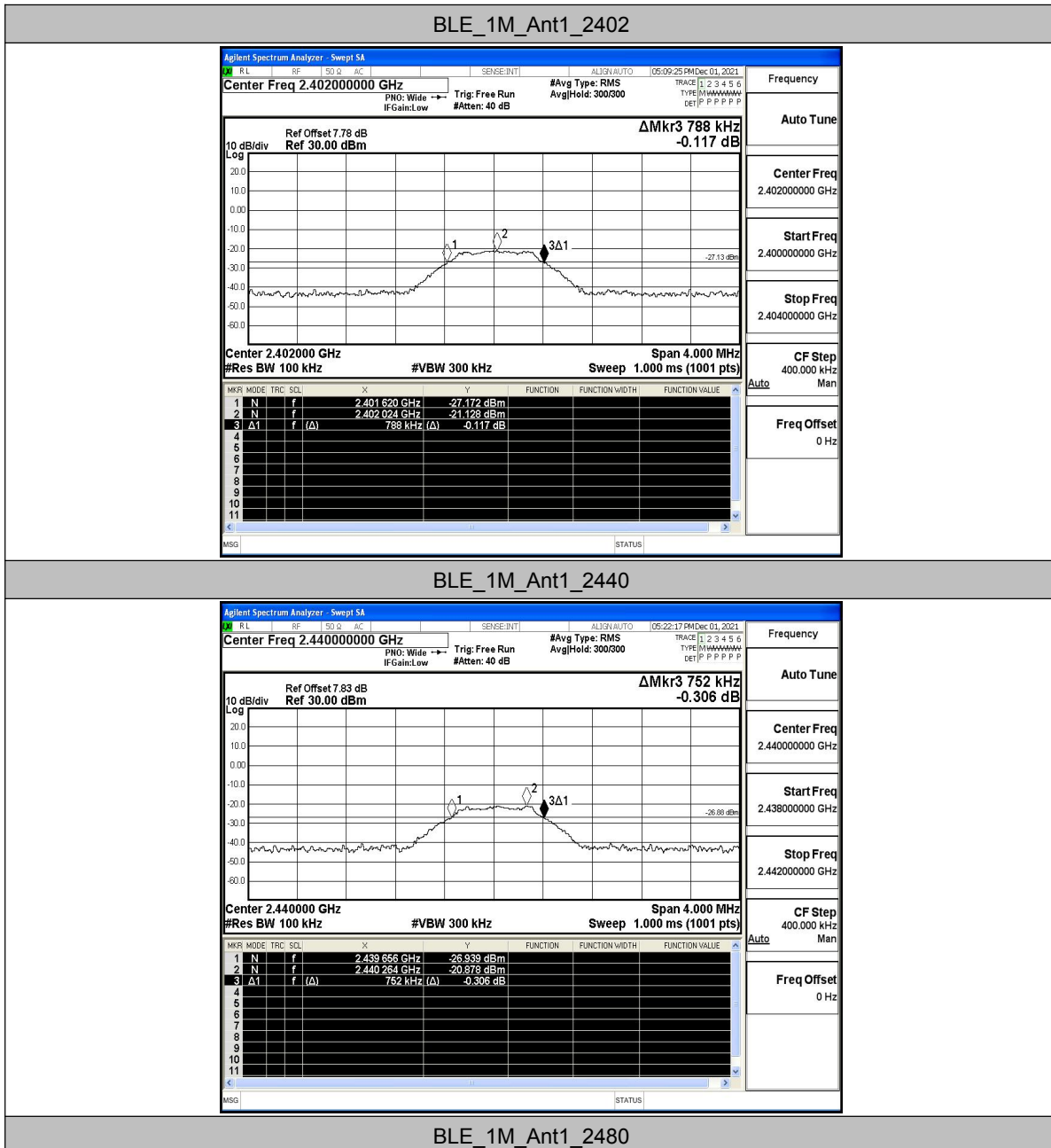


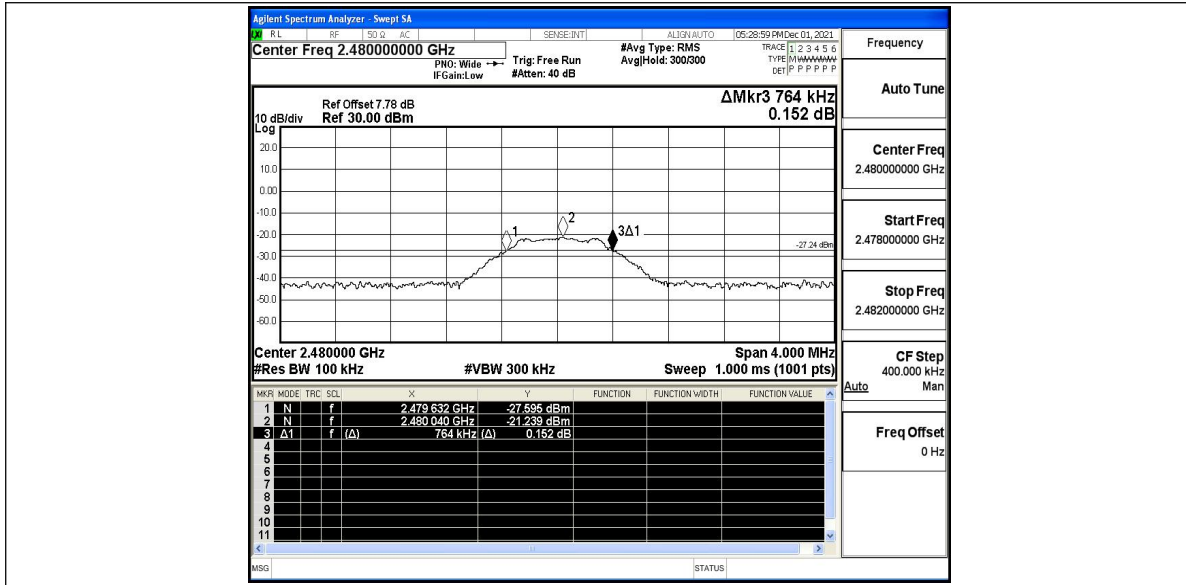
## A.1 DTS Bandwidth

### Test Result

| TestMode | Antenna | Channel | DTS BW [MHz] | FL[MHz]  | FH[MHz]  | Limit[MHz] | Verdict |
|----------|---------|---------|--------------|----------|----------|------------|---------|
| BLE_1M   | Ant1    | 2402    | 0.788        | 2401.620 | 2402.408 | ≥0.5       | PASS    |
|          |         | 2440    | 0.752        | 2439.656 | 2440.408 | ≥0.5       | PASS    |
|          |         | 2480    | 0.764        | 2479.632 | 2480.396 | ≥0.5       | PASS    |

### Test Graphs





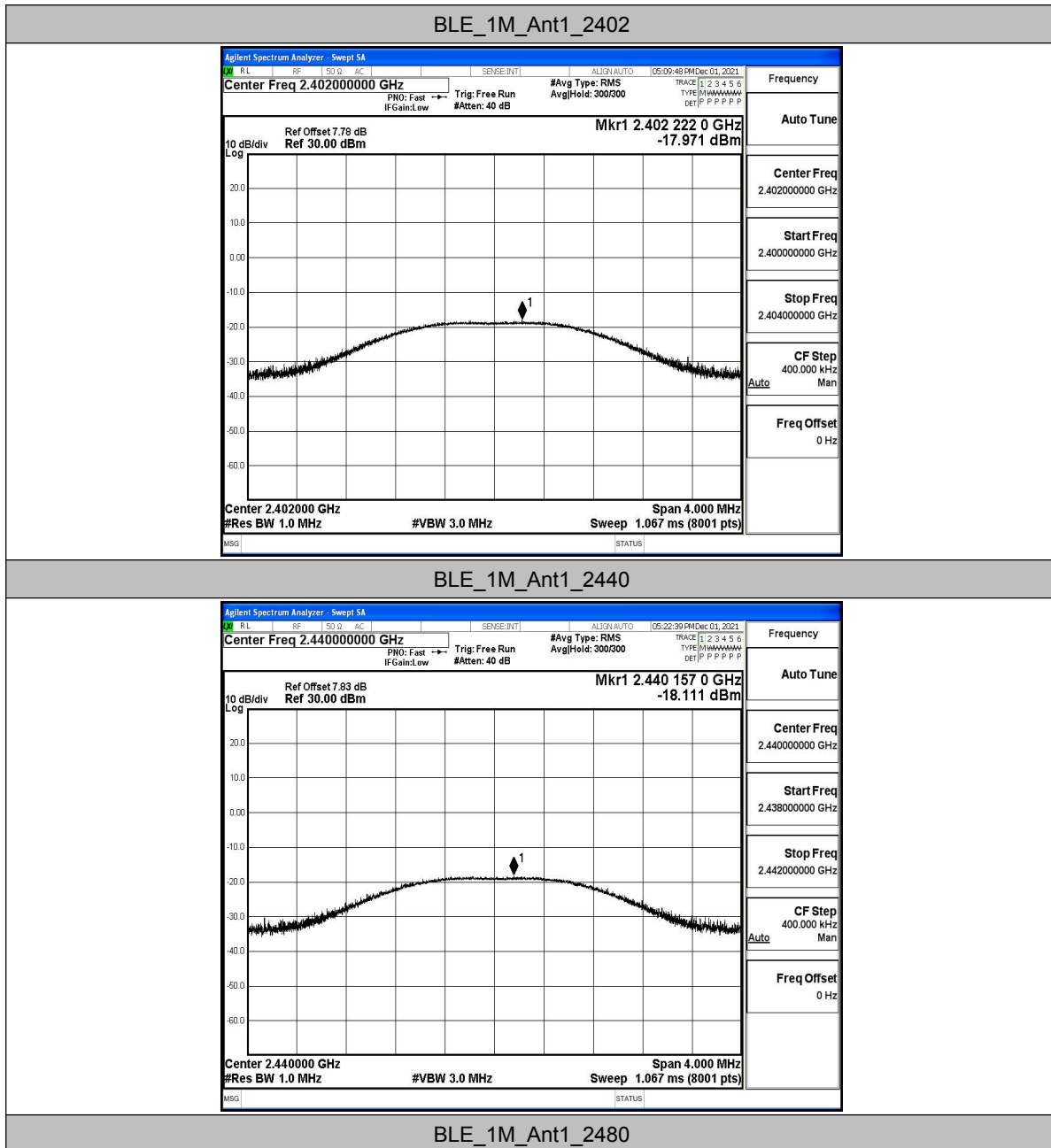


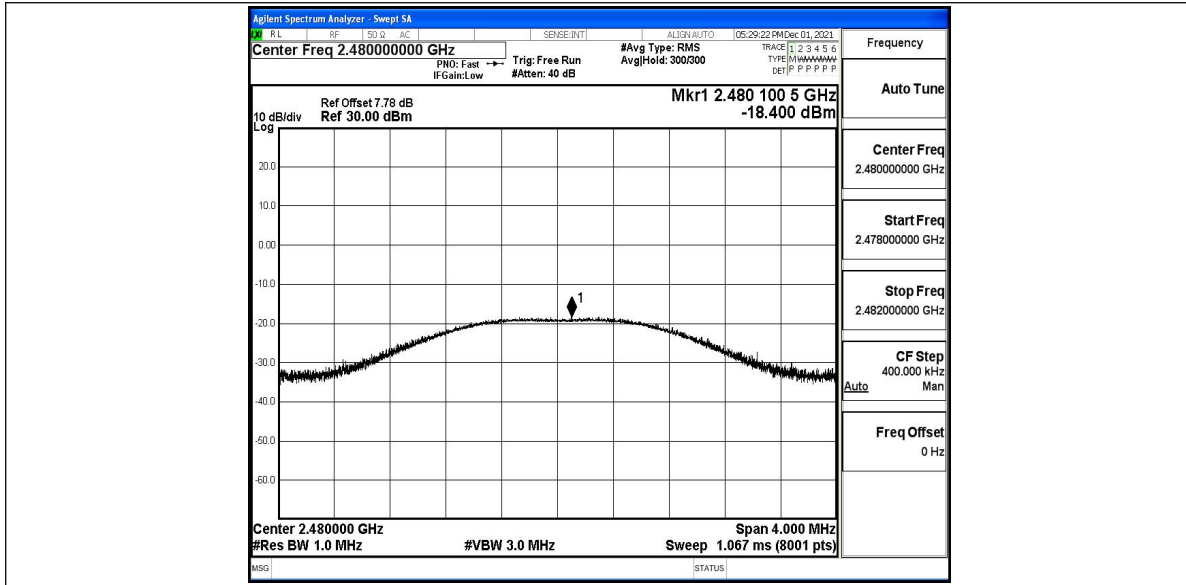
## A.2 Maximum conducted output power

### Test Result

| TestMode | Antenna | Channel | Result[dBm] | Limit[dBm] | Verdict |
|----------|---------|---------|-------------|------------|---------|
| BLE_1M   | Ant1    | 2402    | -17.97      | ≤30        | PASS    |
|          |         | 2440    | -18.11      | ≤30        | PASS    |
|          |         | 2480    | -18.4       | ≤30        | PASS    |

### Test Graphs





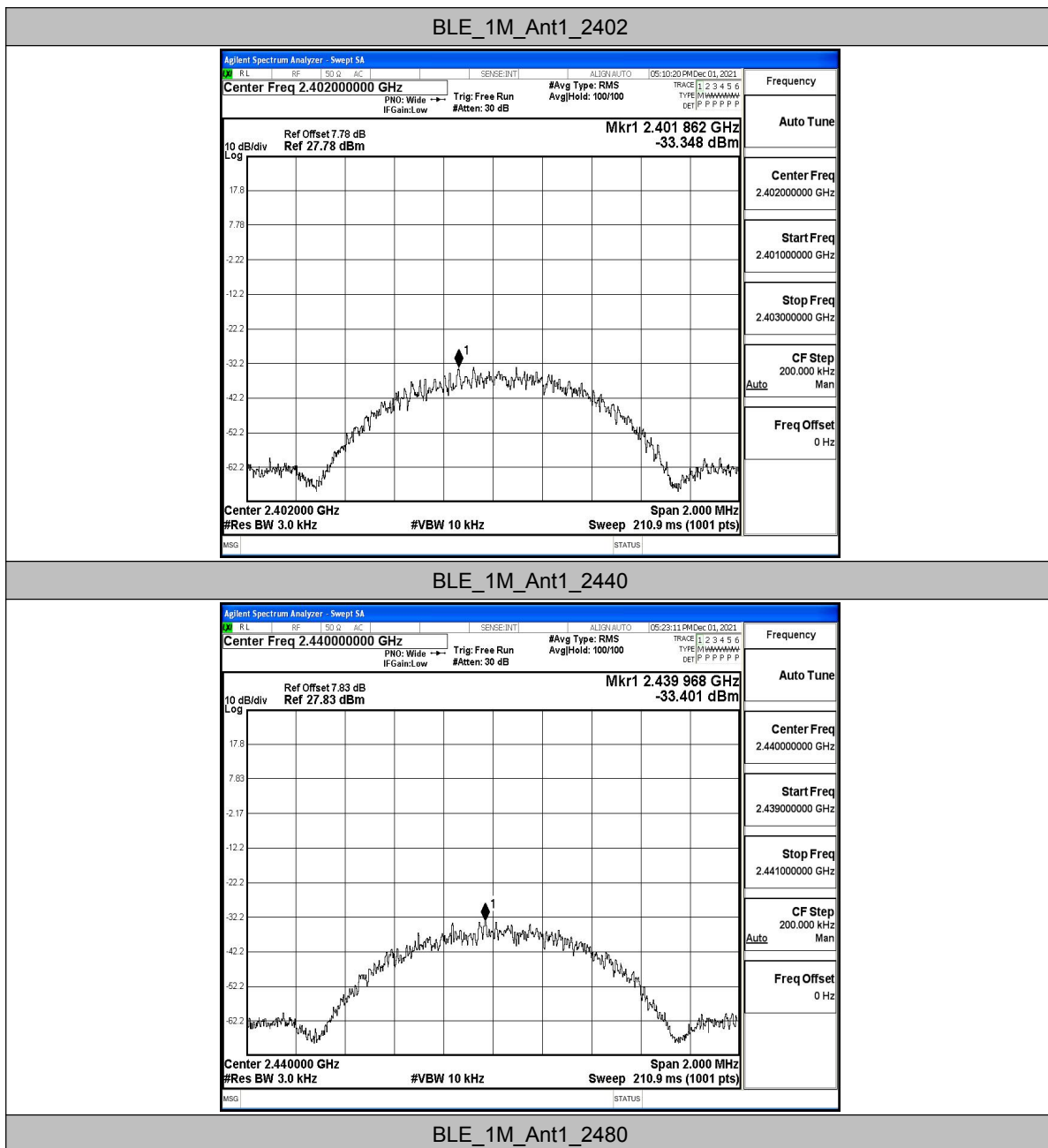


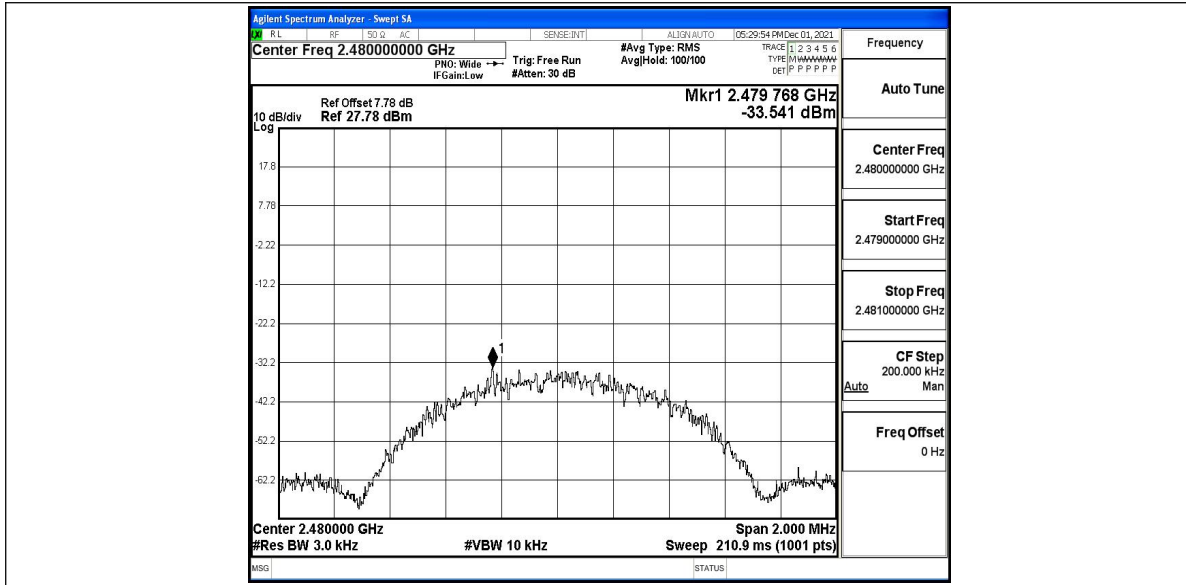
### A.3 Maximum power spectral density

#### Test Result

| TestMode | Antenna | Channel | Result[dBm/3-100kHz] | Limit[dBm/3kHz] | Verdict |
|----------|---------|---------|----------------------|-----------------|---------|
| BLE_1M   | Ant1    | 2402    | -33.35               | ≤8              | PASS    |
|          |         | 2440    | -33.4                | ≤8              | PASS    |
|          |         | 2480    | -33.54               | ≤8              | PASS    |

#### Test Graphs





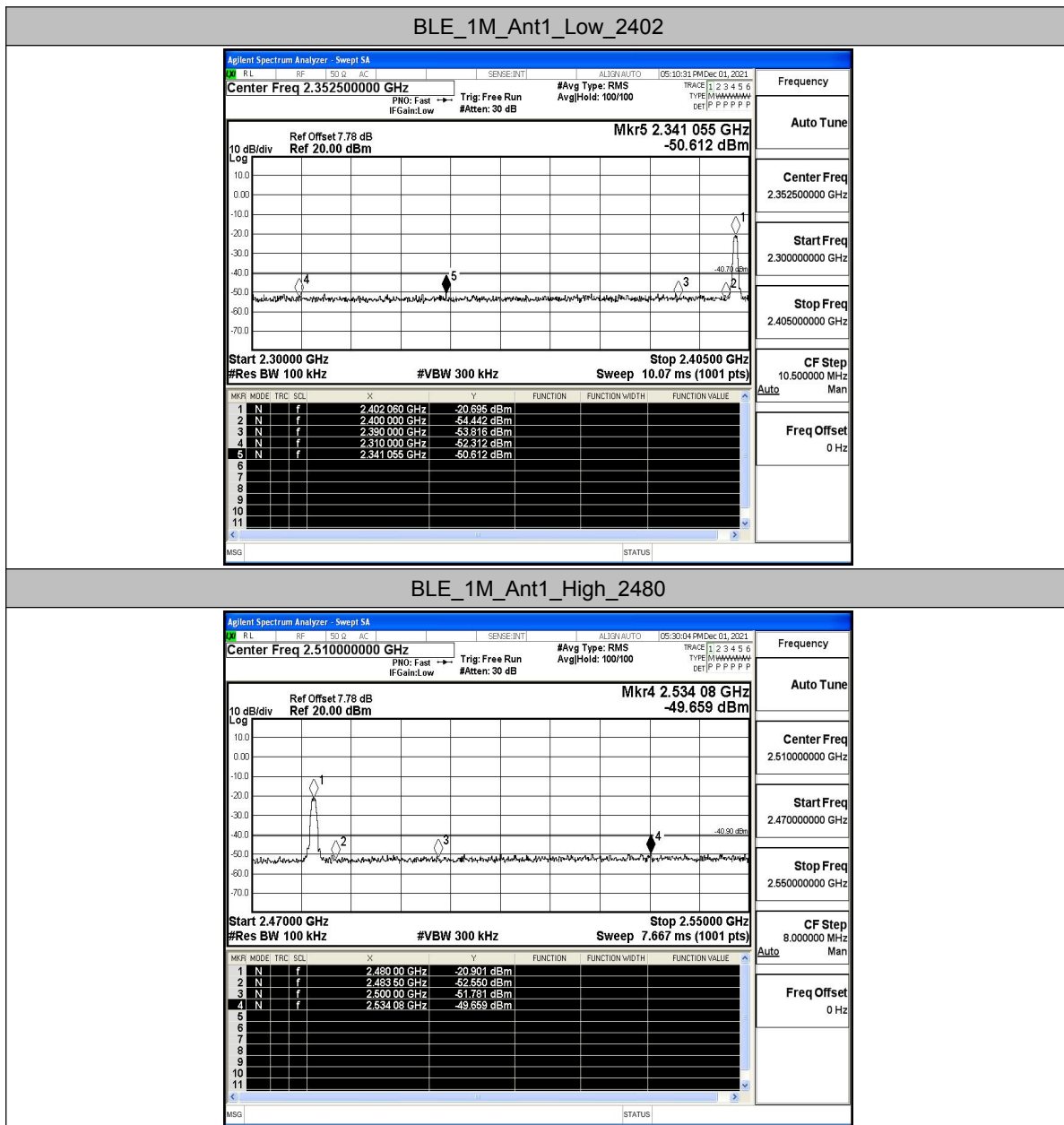


## A.4 Band edge measurements

### Test Result

| TestMode | Antenna | ChName | Channel | RefLevel[dBm] | Result[dBm] | Limit[dBm] | Verdict |
|----------|---------|--------|---------|---------------|-------------|------------|---------|
| BLE_1M   | Ant1    | Low    | 2402    | -20.70        | -50.61      | ≤-40.7     | PASS    |
|          |         | High   | 2480    | -20.90        | -49.66      | ≤-40.9     | PASS    |

### Test Graphs





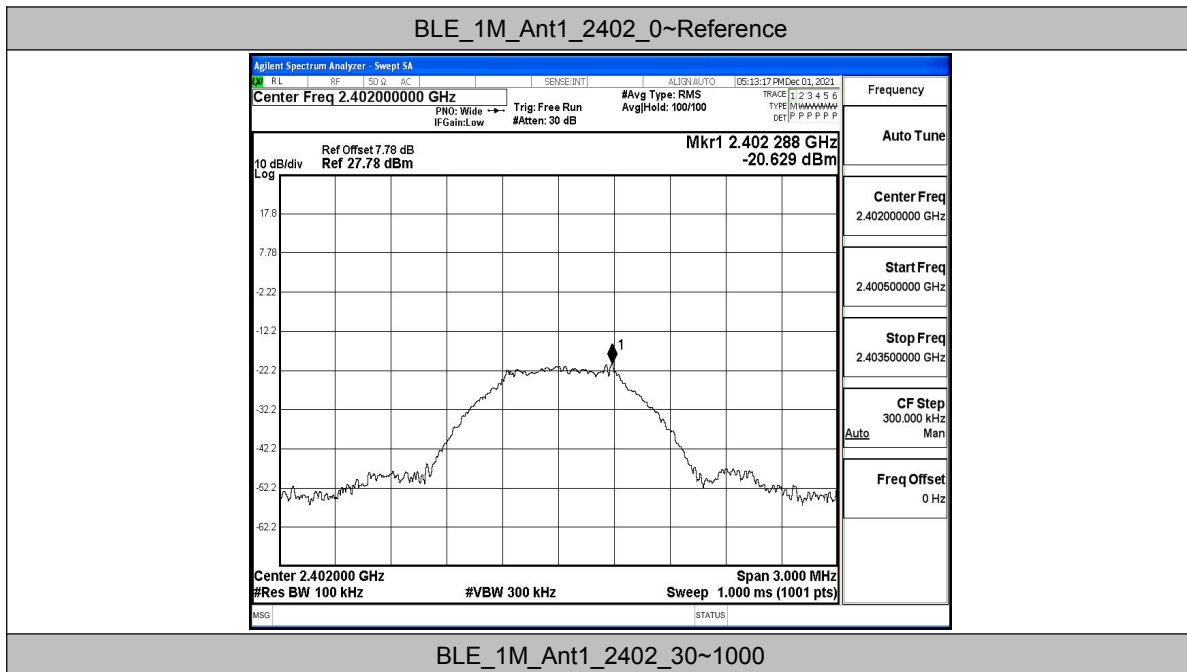


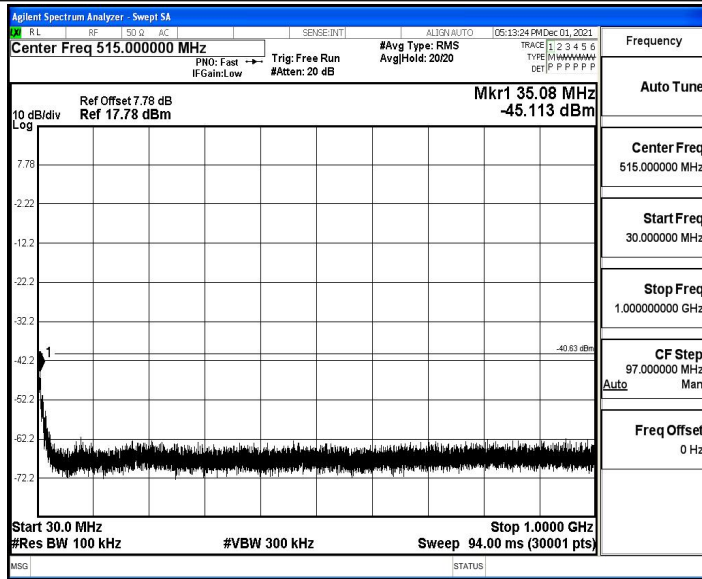
## A.5 Conducted Spurious Emission

### Test Result

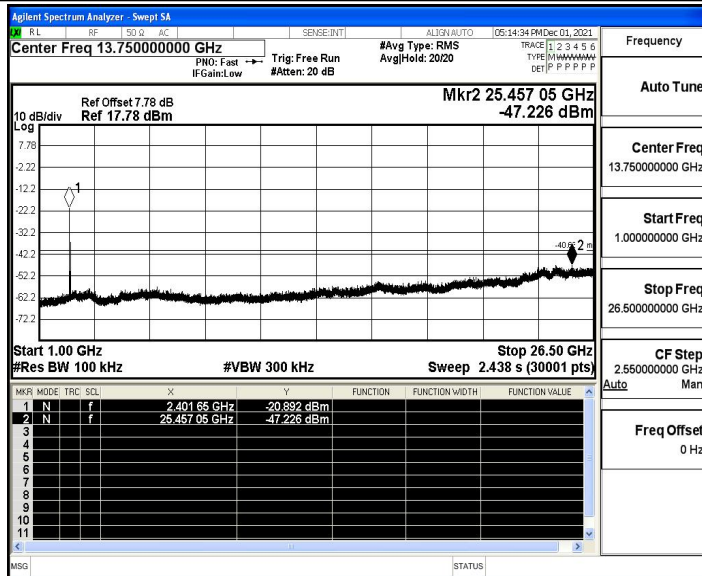
| TestMode | Antenna | Channel | FreqRange [MHz] | RefLevel [dBm] | Result[dBm] | Limit[dBm] | Verdict |
|----------|---------|---------|-----------------|----------------|-------------|------------|---------|
| BLE_1M   | Ant1    | 2402    | Reference       | -20.63         | -20.63      | ---        | PASS    |
|          |         |         | 30~1000         | -20.63         | -45.11      | ≤-40.63    | PASS    |
|          |         |         | 1000~26500      | -20.63         | -47.23      | ≤-40.63    | PASS    |
|          |         | 2440    | Reference       | -20.86         | -20.86      | ---        | PASS    |
|          |         |         | 30~1000         | -20.86         | -47.73      | ≤-40.86    | PASS    |
|          |         |         | 1000~26500      | -20.86         | -47.11      | ≤-40.86    | PASS    |
|          |         | 2480    | Reference       | -21.15         | -21.15      | ---        | PASS    |
|          |         |         | 30~1000         | -21.15         | -45.45      | ≤-41.15    | PASS    |
|          |         |         | 1000~26500      | -21.15         | -47.26      | ≤-41.15    | PASS    |

### Test Graphs

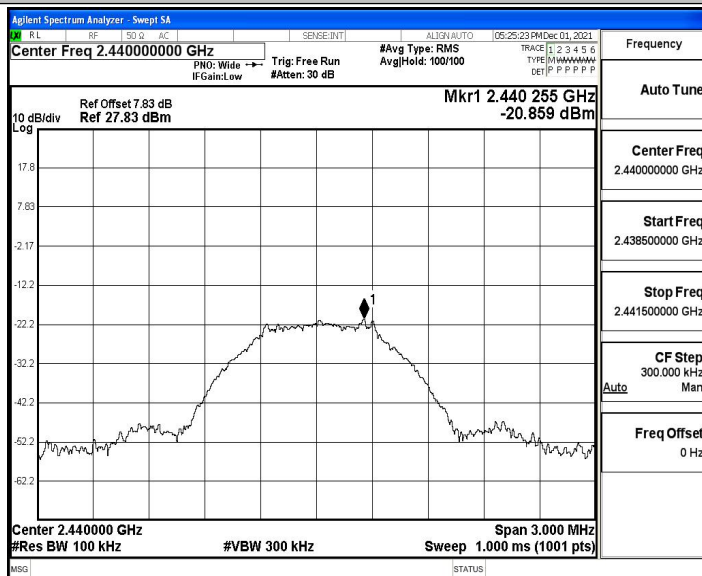




BLE\_1M\_Ant1\_2402\_1000~26500

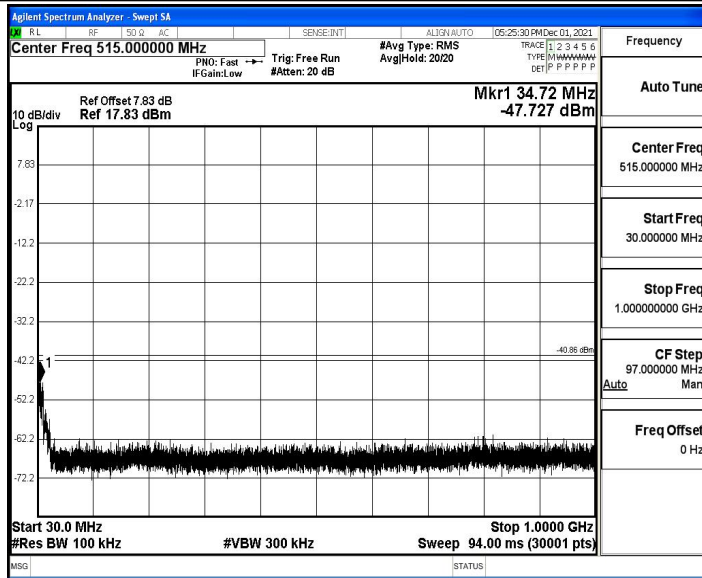


BLE\_1M\_Ant1\_2440\_0~Reference

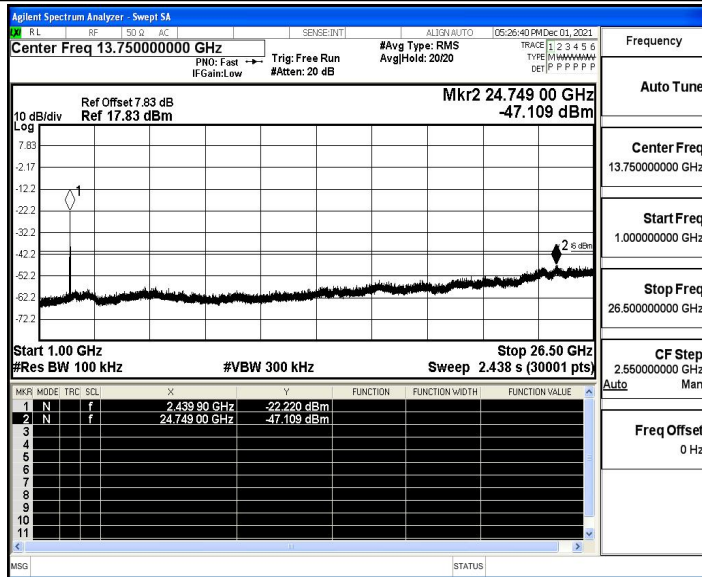




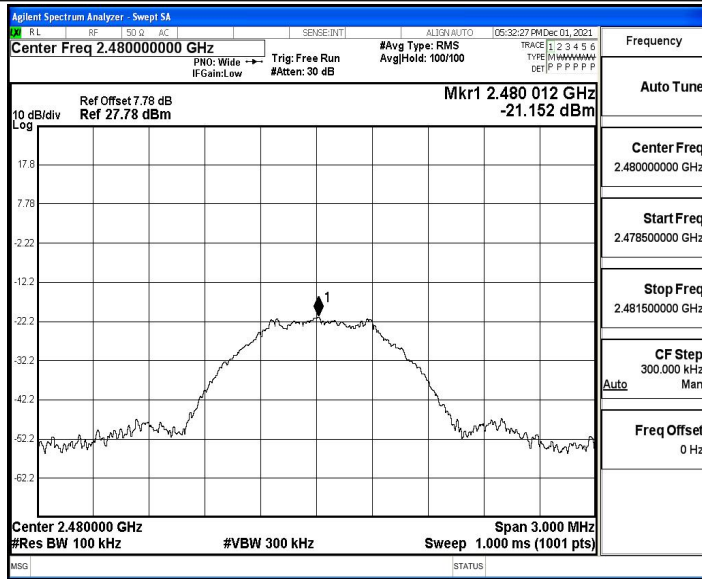
BLE\_1M\_Ant1\_2440\_30~1000



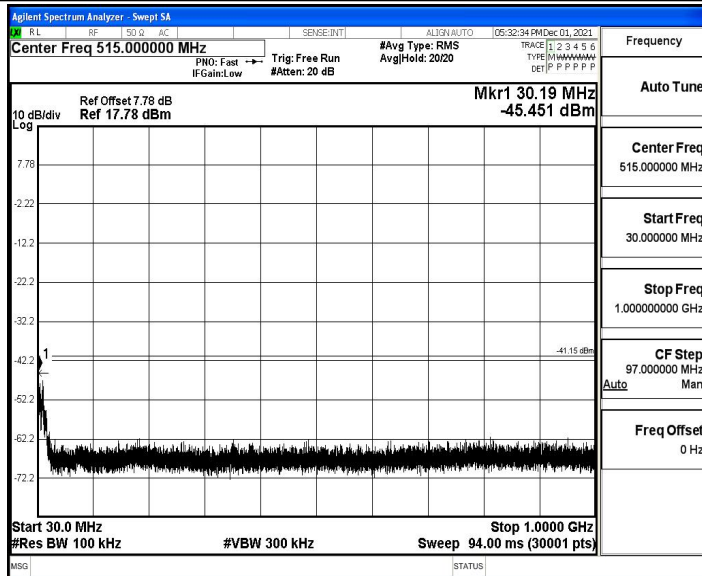
BLE\_1M\_Ant1\_2440\_1000~26500



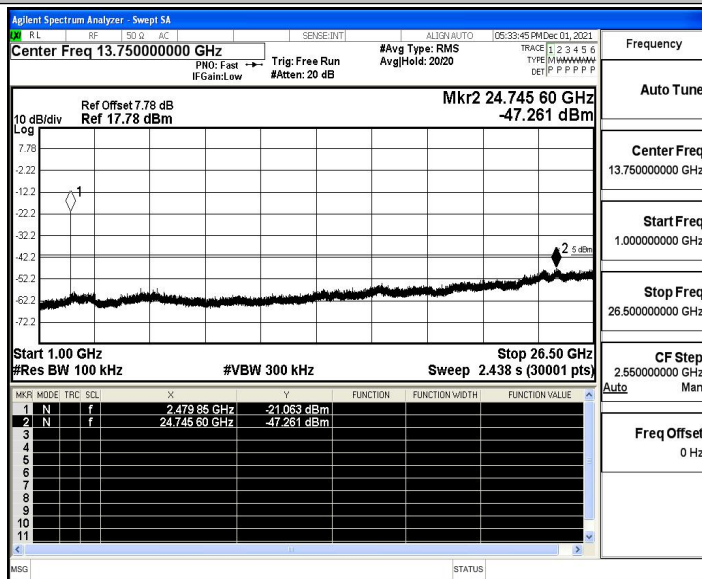
BLE\_1M\_Ant1\_2480\_0~Reference



BLE\_1M\_Ant1\_2480\_30~1000



BLE\_1M\_Ant1\_2480\_1000~26500



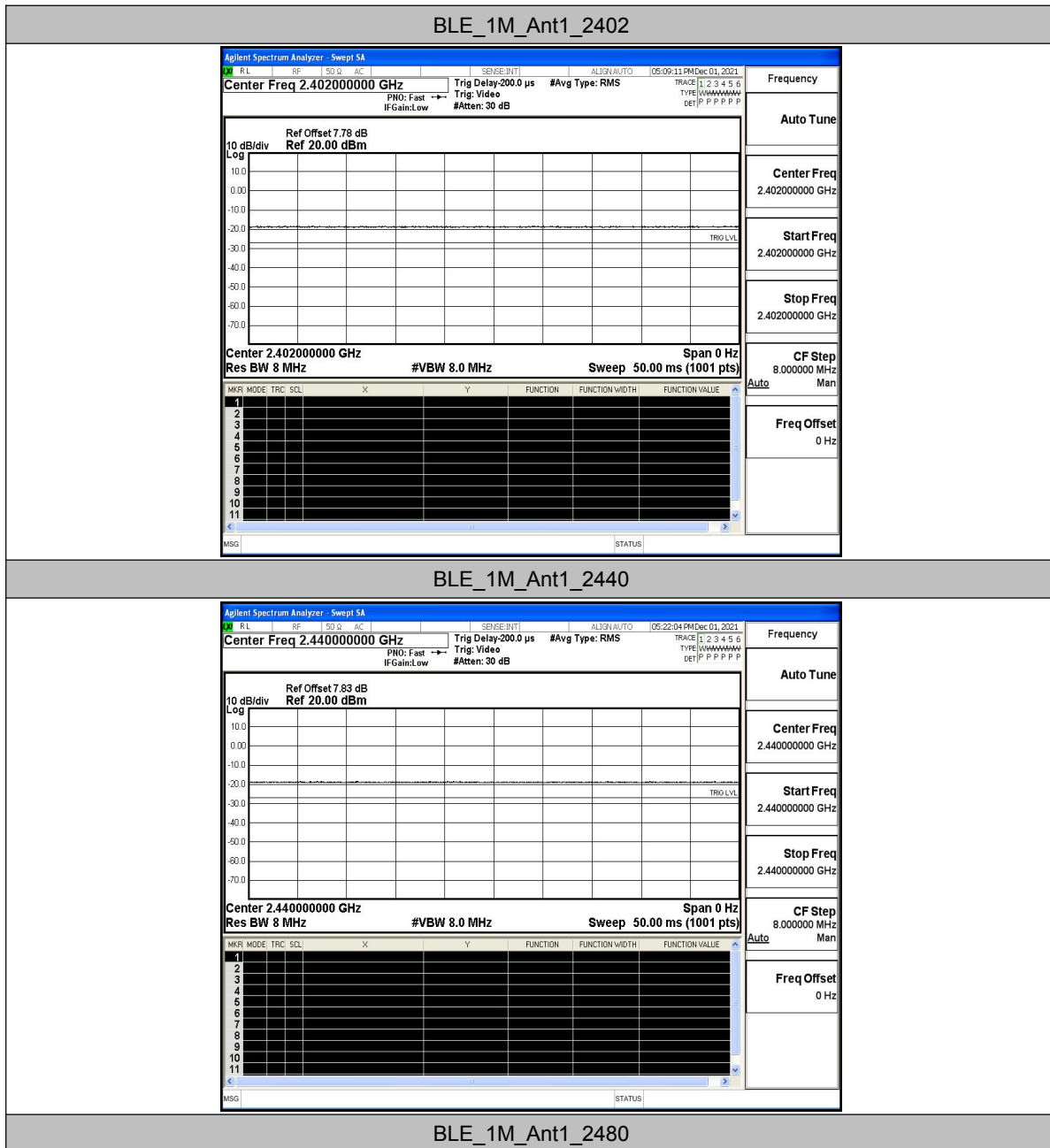


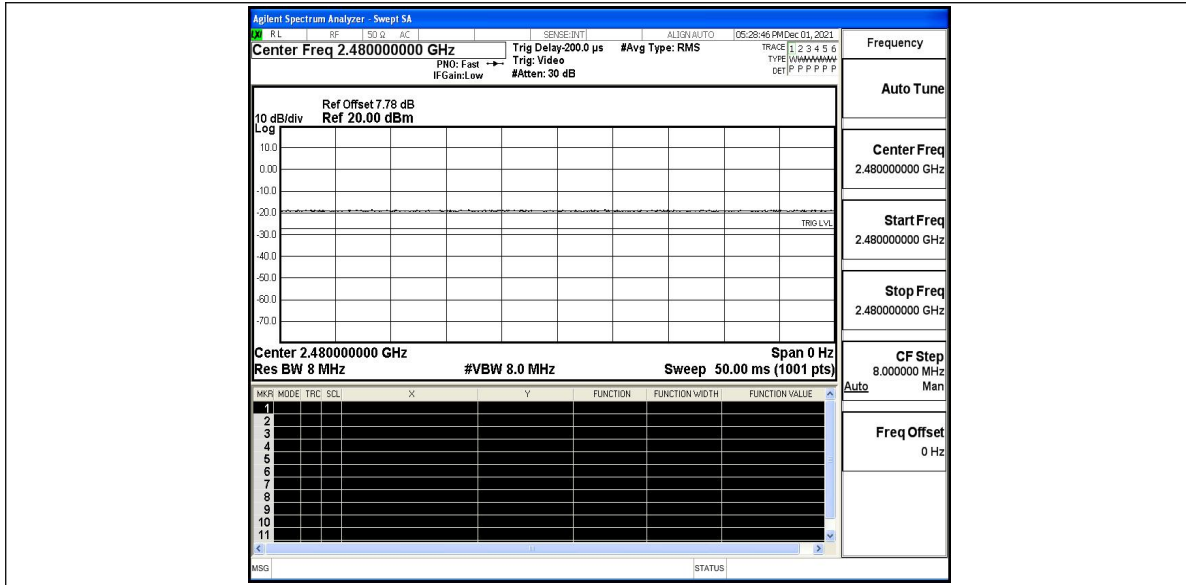
## A.6 Duty Cycle

### Test Result

| TestMode | Antenna | Channel | ON Time [ms] | Period [ms] | X      | DC [%] | xFactor | Limit | Verdict |
|----------|---------|---------|--------------|-------------|--------|--------|---------|-------|---------|
| BLE_1M   | Ant1    | 2402    | 50.00        | 50.00       | 1.0000 | 100.00 | 0.00    | ---   | PASS    |
|          |         | 2440    | 50.00        | 50.00       | 1.0000 | 100.00 | 0.00    | ---   | PASS    |
|          |         | 2480    | 50.00        | 50.00       | 1.0000 | 100.00 | 0.00    | ---   | PASS    |

### Test Graphs







## A.7 Emissions in Restricted Bands

### Test Result

| TestMode | Antenna | ChName | Channel | Detector | Freq. [MHz] | Result [dBm] | Limit [dBm] | Result [dBuV/m] | Limit [dBuV/m] | Verdict |
|----------|---------|--------|---------|----------|-------------|--------------|-------------|-----------------|----------------|---------|
| BLE_1M   | Ant1    | Low    | 2402    | AV       | 2310.000    | -49.62       | ≤-41.20     | 45.58           | ≤54            | PASS    |
|          |         |        |         | AV       | 2389.775    | -49.23       | ≤-41.20     | 45.97           | ≤54            | PASS    |
|          |         |        |         | AV       | 2390.000    | -49.26       | ≤-41.20     | 45.94           | ≤54            | PASS    |
|          |         |        |         | Peak     | 2310.000    | -43.3        | ≤-21.20     | 51.90           | ≤74            | PASS    |
|          |         |        |         | Peak     | 2361.950    | -39.33       | ≤-21.20     | 55.87           | ≤74            | PASS    |
|          |         |        |         | Peak     | 2390.000    | -43.83       | ≤-21.20     | 51.37           | ≤74            | PASS    |
|          |         | High   | 2480    | AV       | 2483.500    | -48.88       | ≤-41.20     | 46.32           | ≤54            | PASS    |
|          |         |        |         | AV       | 2499.440    | -48.64       | ≤-41.20     | 46.56           | ≤54            | PASS    |
|          |         |        |         | AV       | 2500.000    | -48.66       | ≤-41.20     | 46.54           | ≤54            | PASS    |
|          |         |        |         | Peak     | 2483.500    | -44.35       | ≤-21.20     | 50.85           | ≤74            | PASS    |
|          |         |        |         | Peak     | 2499.920    | -39.81       | ≤-21.20     | 55.39           | ≤74            | PASS    |
|          |         |        |         | Peak     | 2500.000    | -40.33       | ≤-21.20     | 54.87           | ≤74            | PASS    |

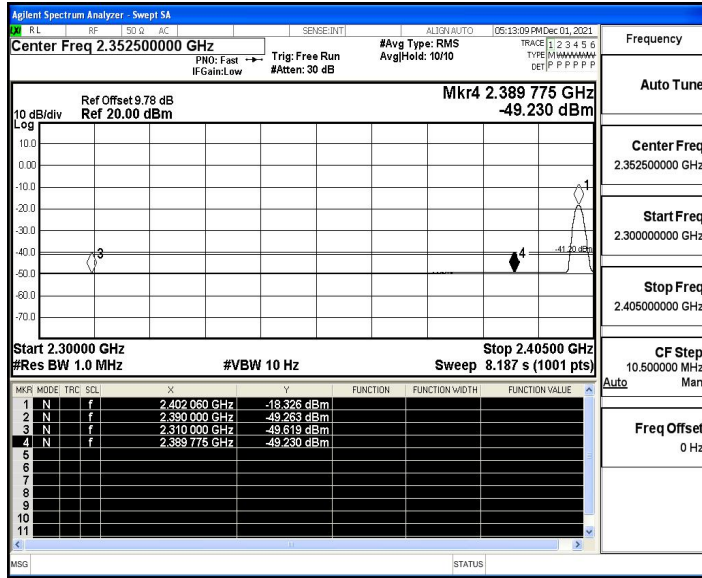
Note:

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.

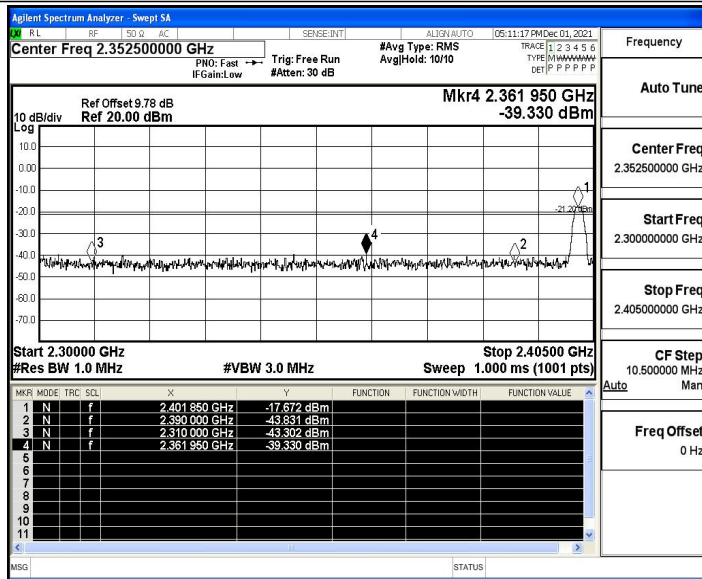


### Test Graphs

BLE\_1M\_Ant1\_Low\_2402\_AV

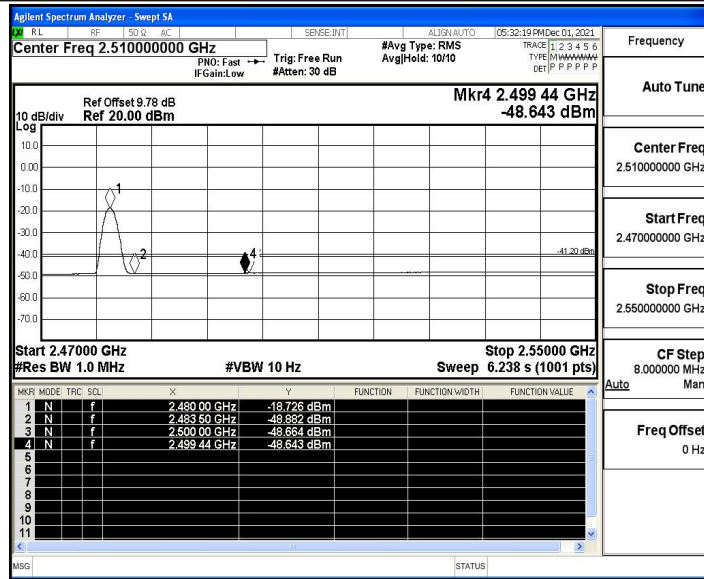


BLE\_1M\_Ant1\_Low\_2402\_Peak



BLE\_1M\_Ant1\_High\_2480\_AV





BLE\_1M\_Ant1\_High\_2480\_Peak

