



## Appendix A

### RF Test Data for 2.4G BLE (Conducted Measurement)

Product Name: smart creative light panel

Test Model: FWWPCB-33-12

#### Environmental Conditions

|                    |           |
|--------------------|-----------|
| Temperature:       | 21.1 ° C  |
| Relative Humidity: | 52.2%     |
| ATM Pressure:      | 100.0 kPa |
| Test Engineer:     | Jay Li    |
| Supervised by:     | Huan Li   |

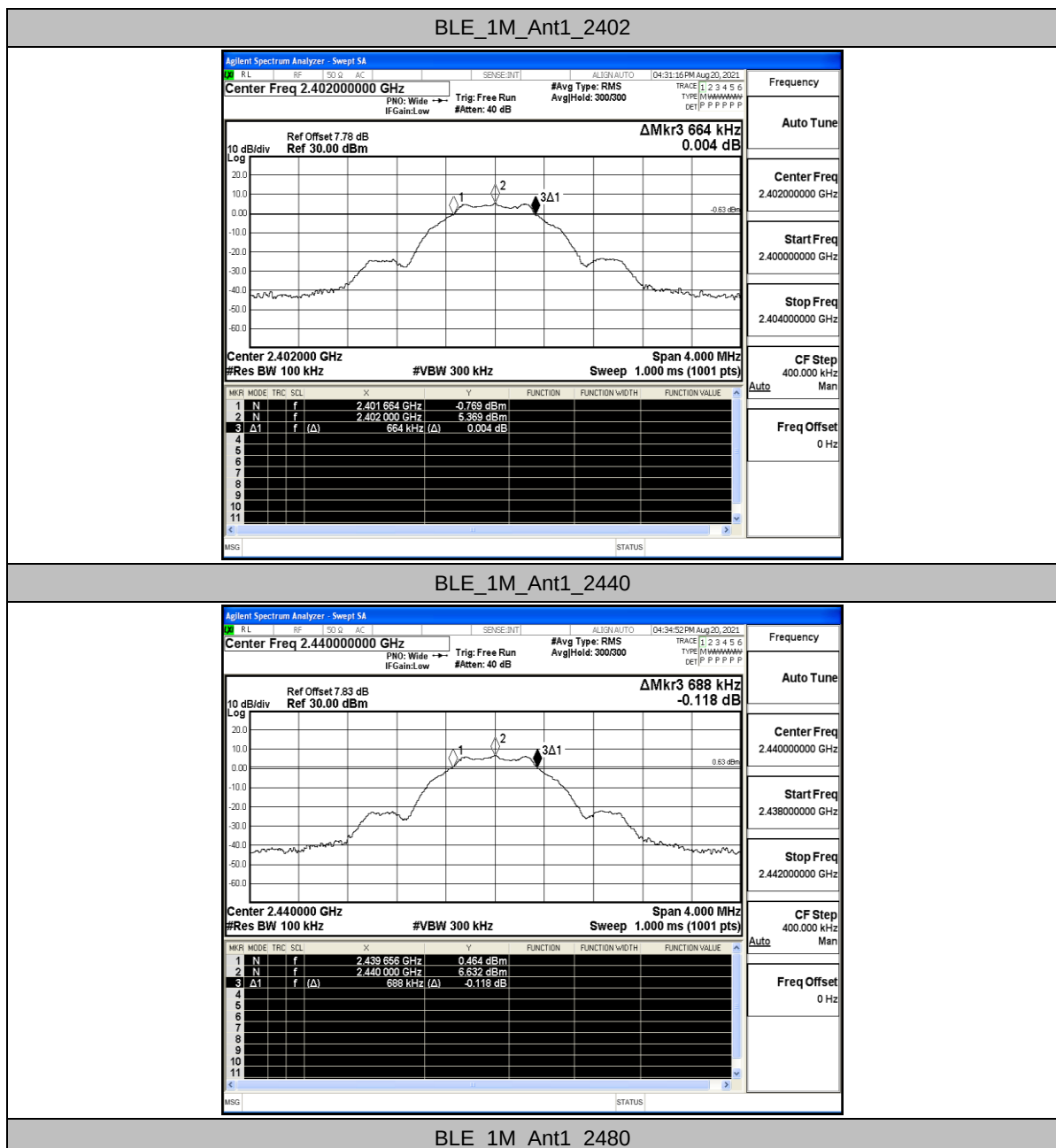


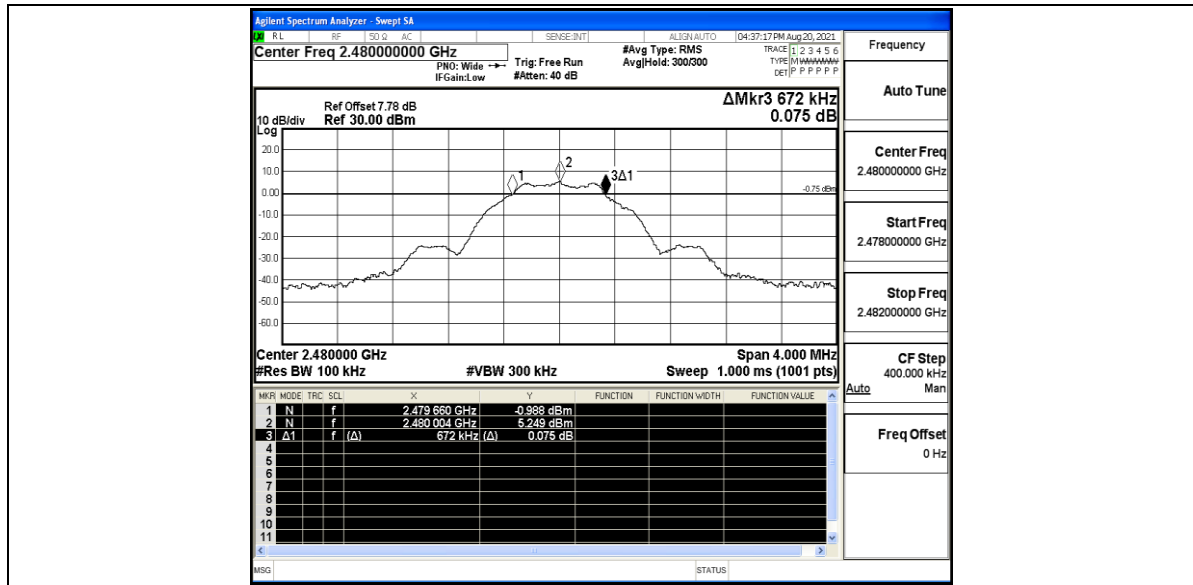
## A.1 DTS Bandwidth

### Test Result

| TestMode | Antenna | Channel | DTS BW [MHz] | FL[MHz]  | FH[MHz]  | Limit[MHz] | Verdict |
|----------|---------|---------|--------------|----------|----------|------------|---------|
| BLE_1M   | Ant1    | 2402    | 0.664        | 2401.664 | 2402.328 | ≥0.5       | PASS    |
|          |         | 2440    | 0.688        | 2439.656 | 2440.344 | ≥0.5       | PASS    |
|          |         | 2480    | 0.672        | 2479.660 | 2480.332 | ≥0.5       | PASS    |

### Test Graphs





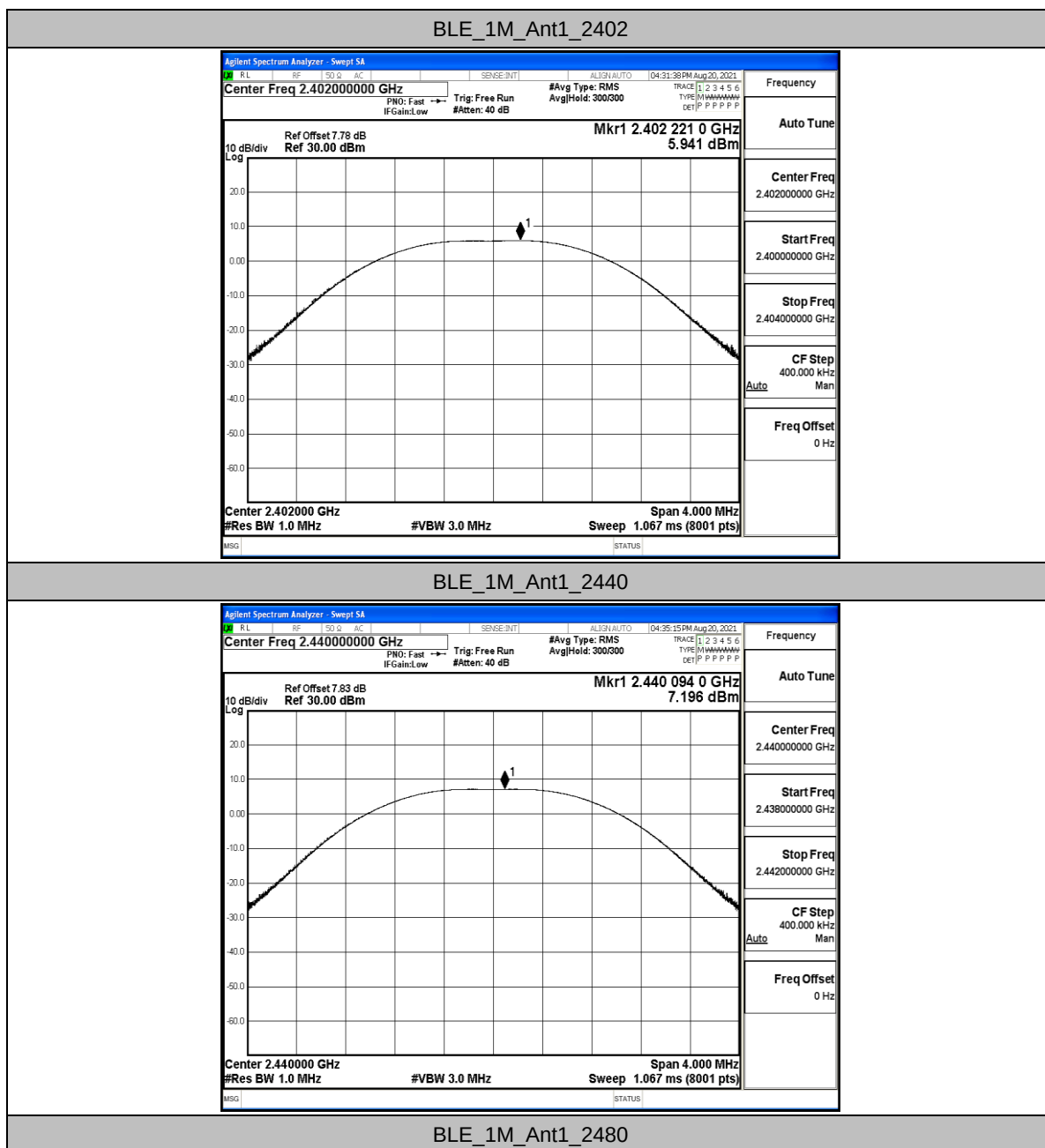


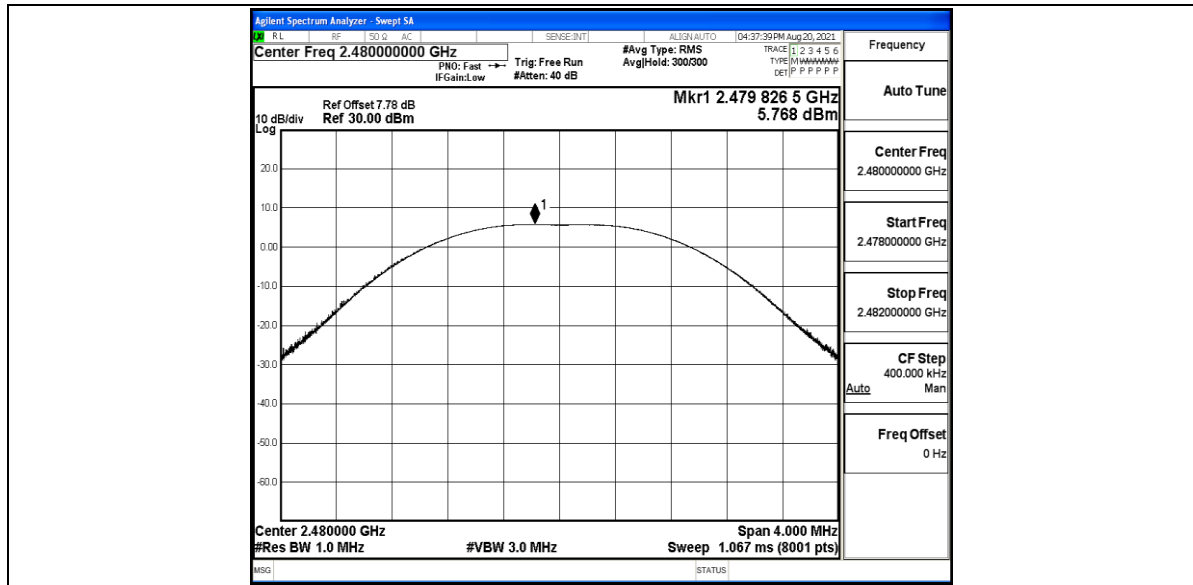
## A.2 Maximum conducted output power

### Test Result

| TestMode | Antenna | Channel | Result[dBm] | Limit[dBm] | Verdict |
|----------|---------|---------|-------------|------------|---------|
| BLE_1M   | Ant1    | 2402    | 5.94        | ≤30        | PASS    |
|          |         | 2440    | 7.20        | ≤30        | PASS    |
|          |         | 2480    | 5.77        | ≤30        | PASS    |

### Test Graphs





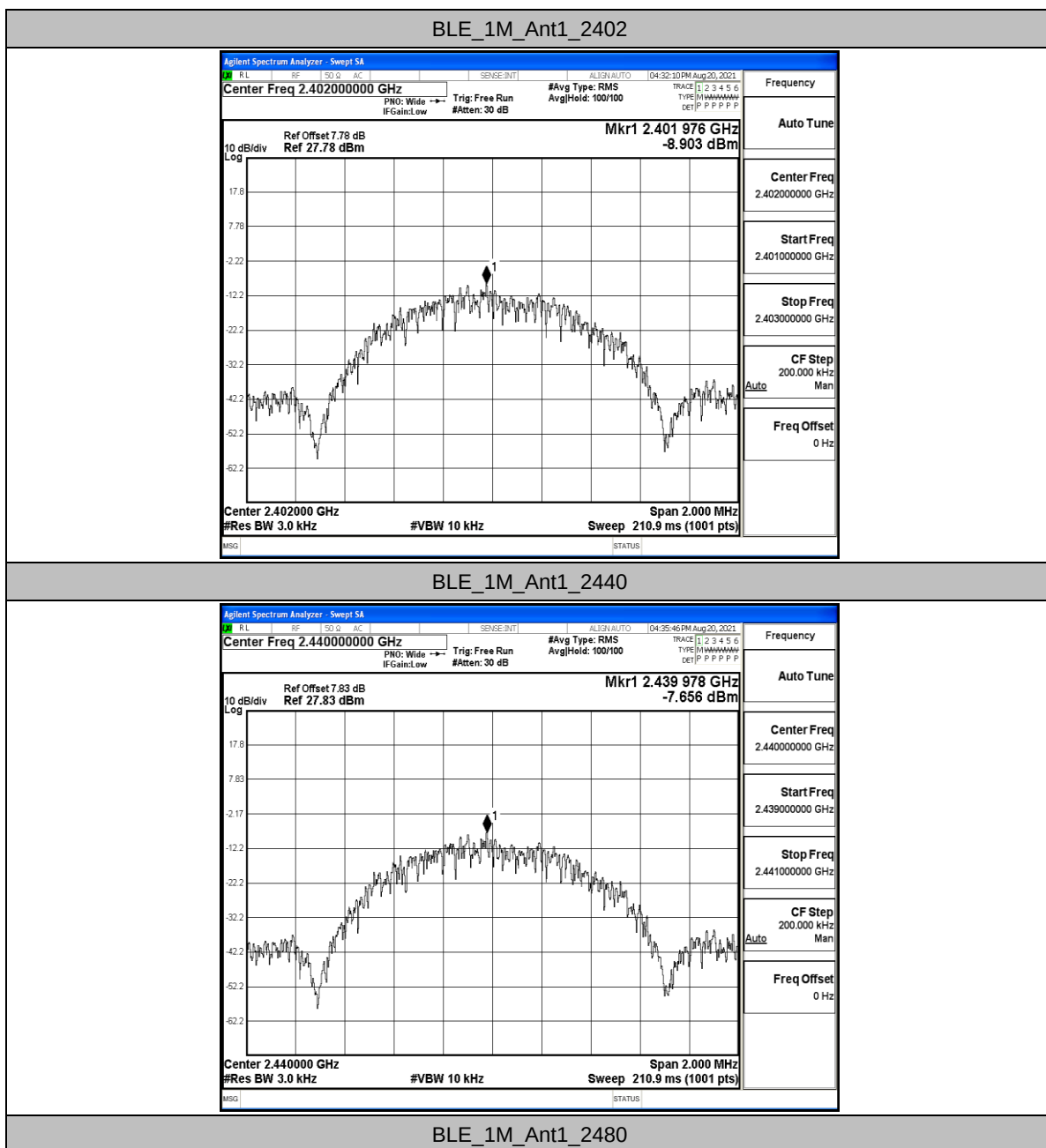


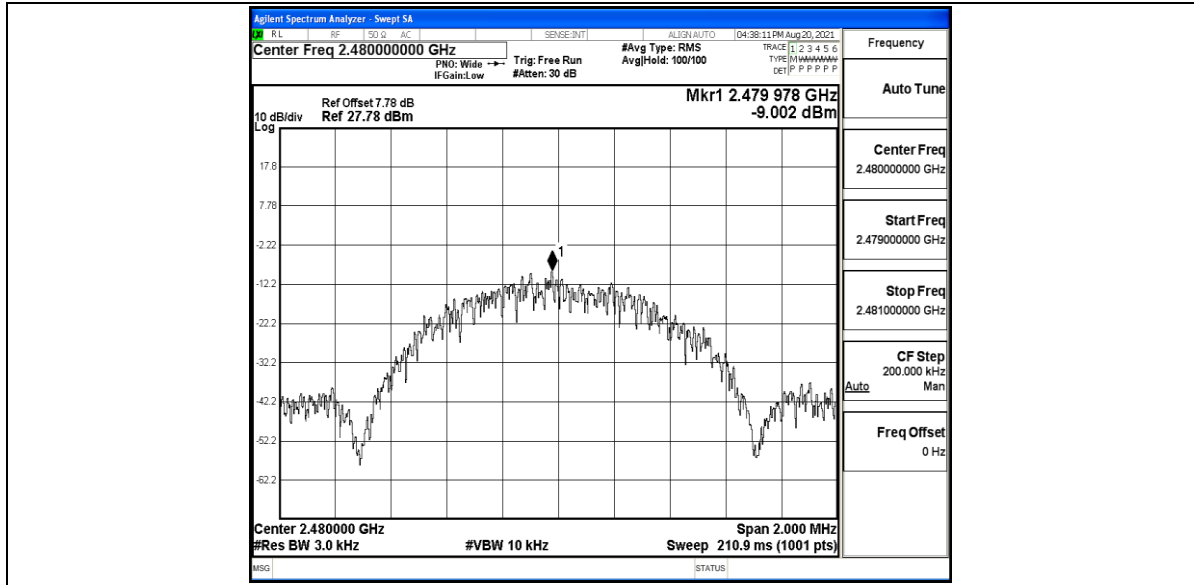
## A.3 Maximum power spectral density

### Test Result

| TestMode | Antenna | Channel | Result[dBm/3-100kHz] | Limit[dBm/3kHz] | Verdict |
|----------|---------|---------|----------------------|-----------------|---------|
| BLE_1M   | Ant1    | 2402    | -8.9                 | ≤8              | PASS    |
|          |         | 2440    | -7.66                | ≤8              | PASS    |
|          |         | 2480    | -9                   | ≤8              | PASS    |

### Test Graphs





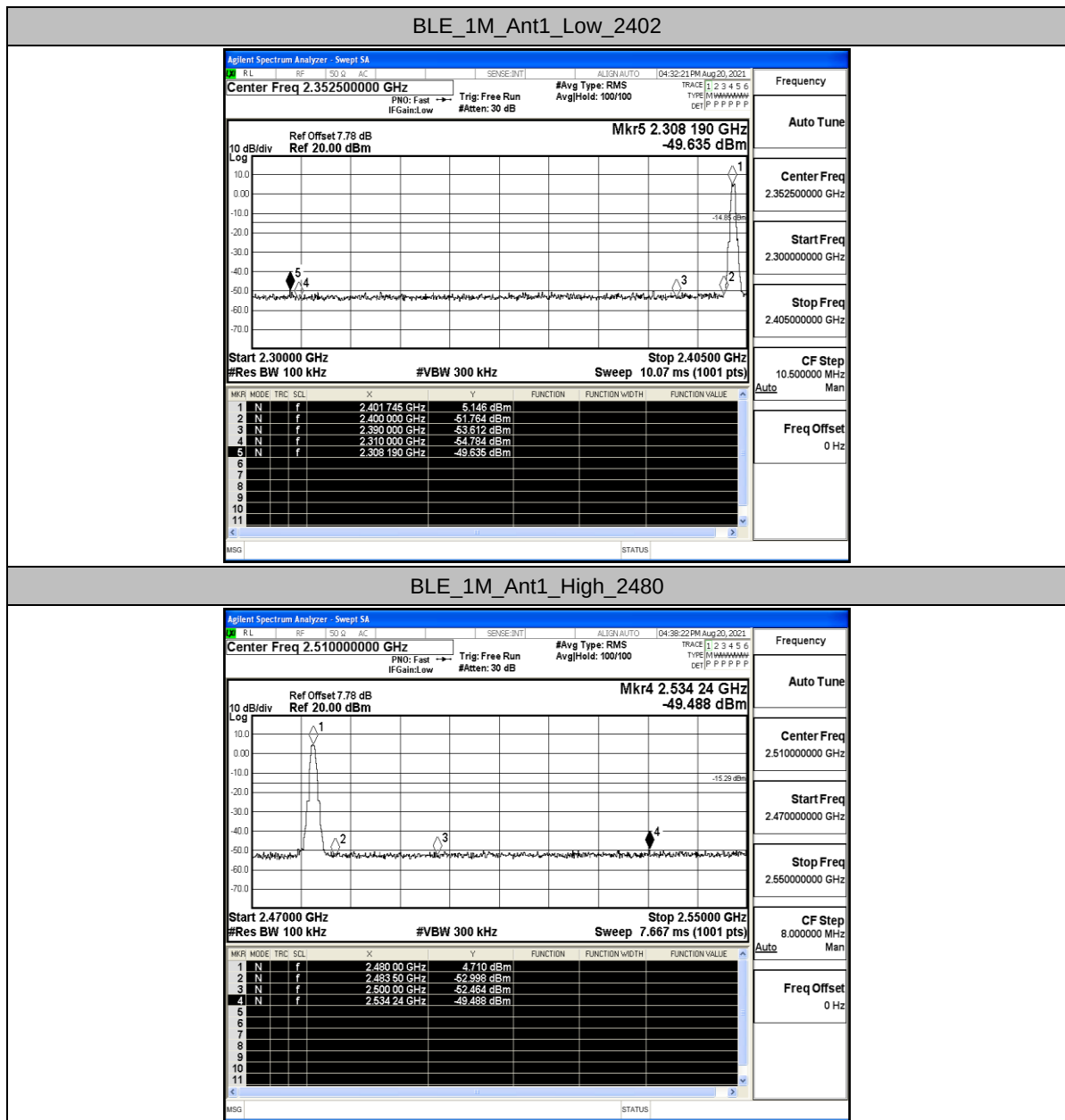


## A.4 Band edge measurements

### Test Result

| TestMode | Antenna | ChName | Channel | RefLevel[dBm] | Result[dBm] | Limit[dBm] | Verdict |
|----------|---------|--------|---------|---------------|-------------|------------|---------|
| BLE_1M   | Ant1    | Low    | 2402    | 5.15          | -49.64      | ≤-14.85    | PASS    |
|          |         | High   | 2480    | 4.71          | -49.49      | ≤-15.29    | PASS    |

### Test Graphs



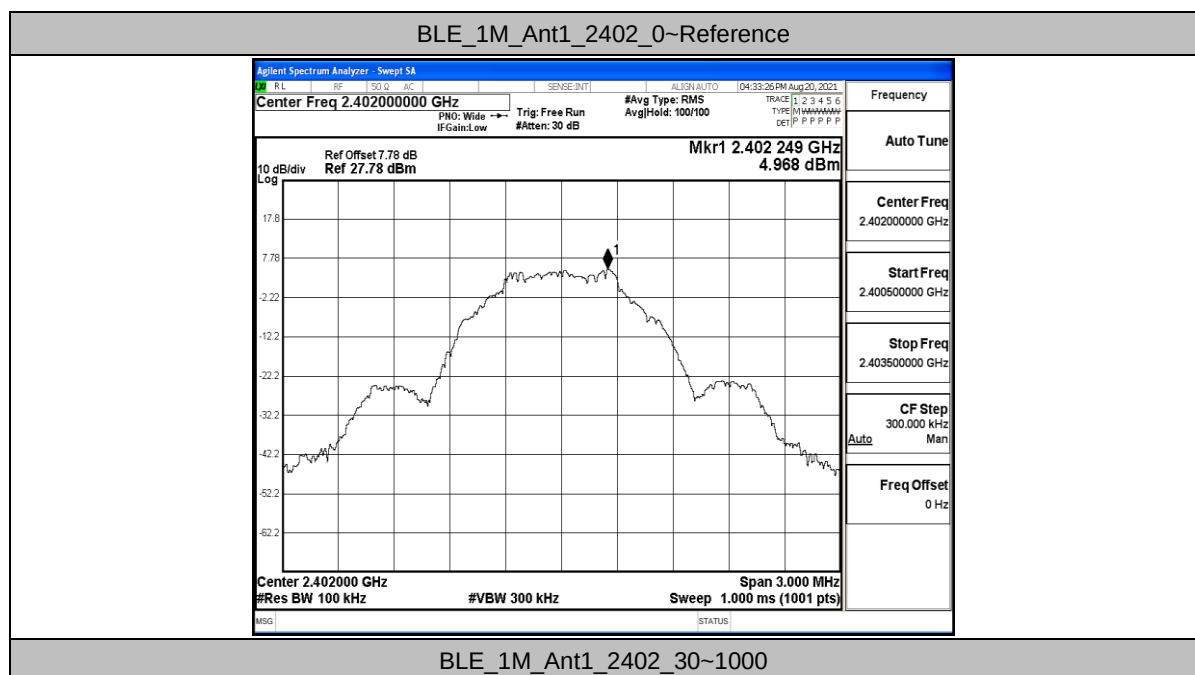


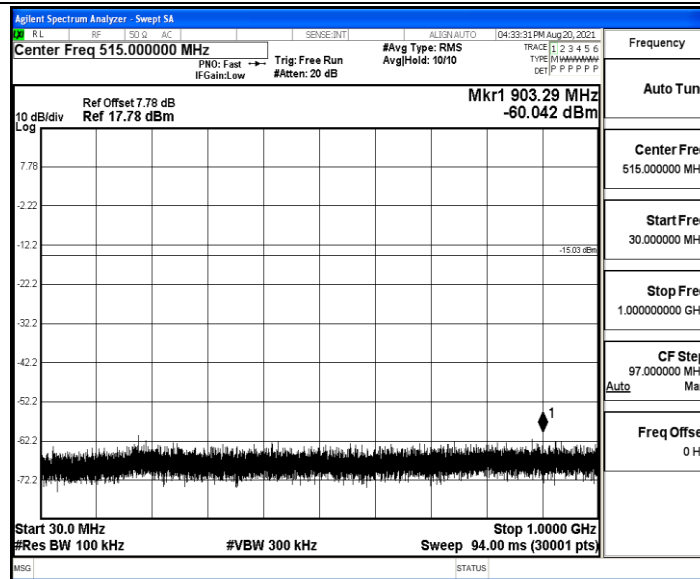
## A.5 Conducted Spurious Emission

### Test Result

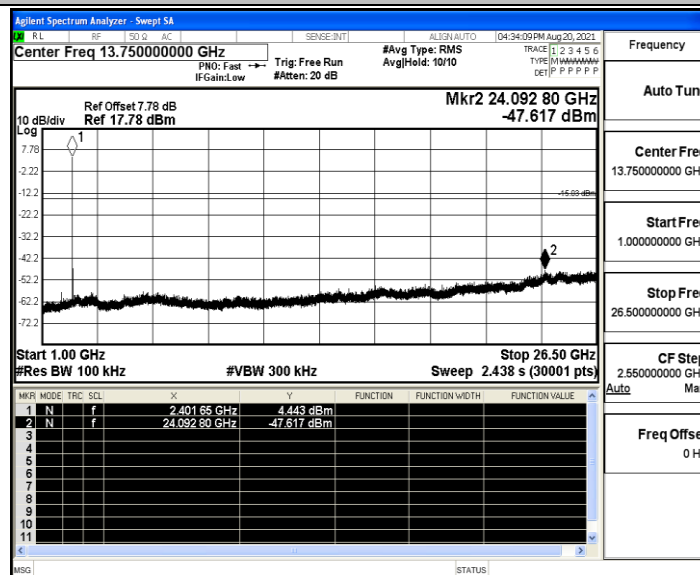
| TestMode | Antenna | Channel | FreqRange [MHz] | RefLevel [dBm] | Result[dBm] | Limit[dBm] | Verdict |
|----------|---------|---------|-----------------|----------------|-------------|------------|---------|
| BLE_1M   | Ant1    | 2402    | Reference       | 4.97           | 4.97        | ---        | PASS    |
|          |         |         | 30~1000         | 4.97           | -60.04      | ≤-15.03    | PASS    |
|          |         |         | 1000~26500      | 4.97           | -47.62      | ≤-15.03    | PASS    |
|          |         | 2440    | Reference       | 6.53           | 6.53        | ---        | PASS    |
|          |         |         | 30~1000         | 6.53           | -60.39      | ≤-13.47    | PASS    |
|          |         |         | 1000~26500      | 6.53           | -47.29      | ≤-13.47    | PASS    |
|          |         | 2480    | Reference       | 5.22           | 5.22        | ---        | PASS    |
|          |         |         | 30~1000         | 5.22           | -61.6       | ≤-14.78    | PASS    |
|          |         |         | 1000~26500      | 5.22           | -47.98      | ≤-14.78    | PASS    |

### Test Graphs

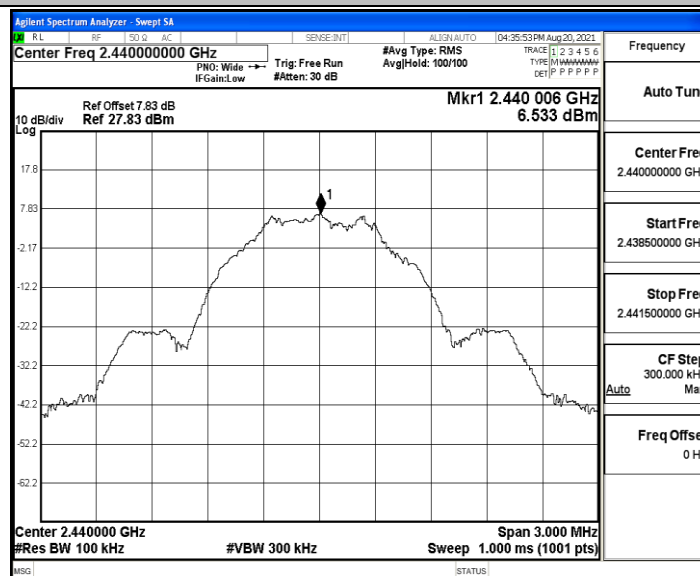




BLE\_1M\_Ant1\_2402\_1000~26500

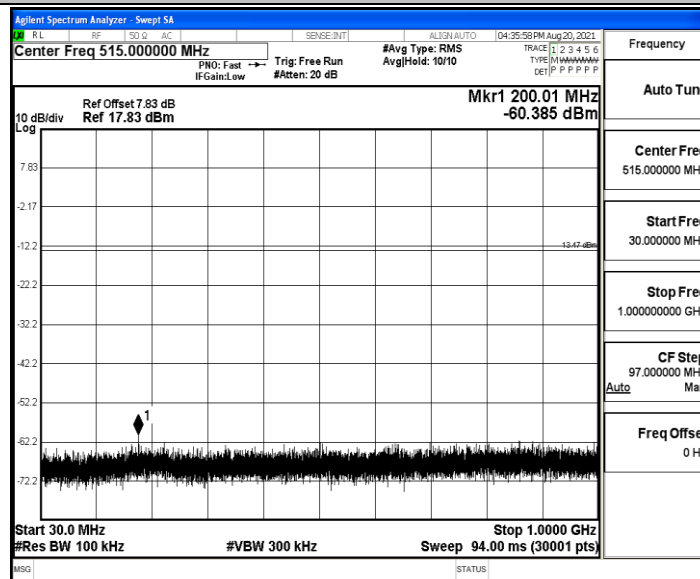


BLE\_1M\_Ant1\_2440\_0~Reference

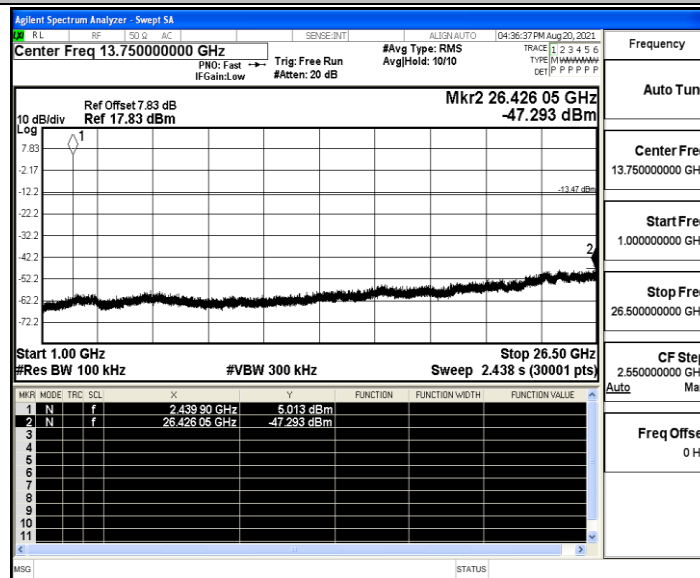




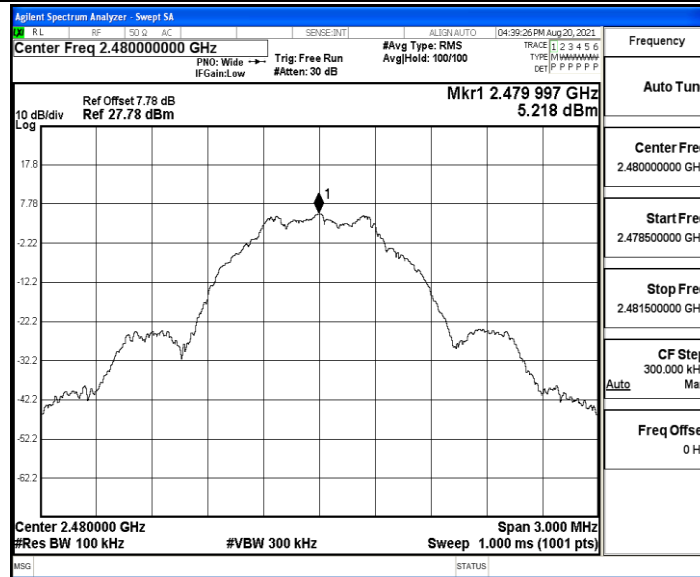
## BLE\_1M\_Ant1\_2440\_30~1000



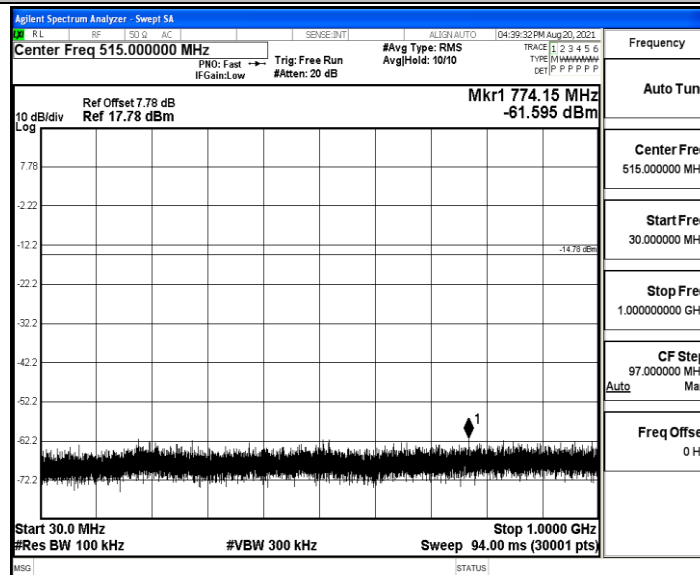
## BLE\_1M\_Ant1\_2440\_1000~26500



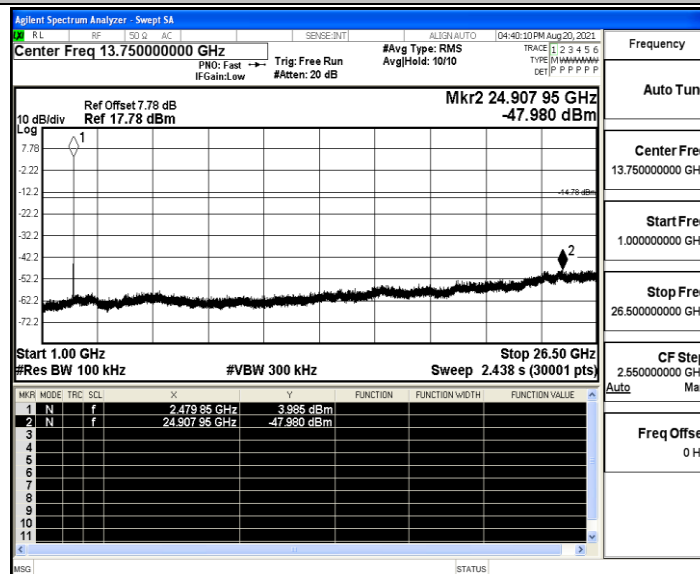
## BLE\_1M\_Ant1\_2480\_0~Reference



BLE\_1M\_Ant1\_2480\_30~1000



BLE\_1M\_Ant1\_2480\_1000~26500



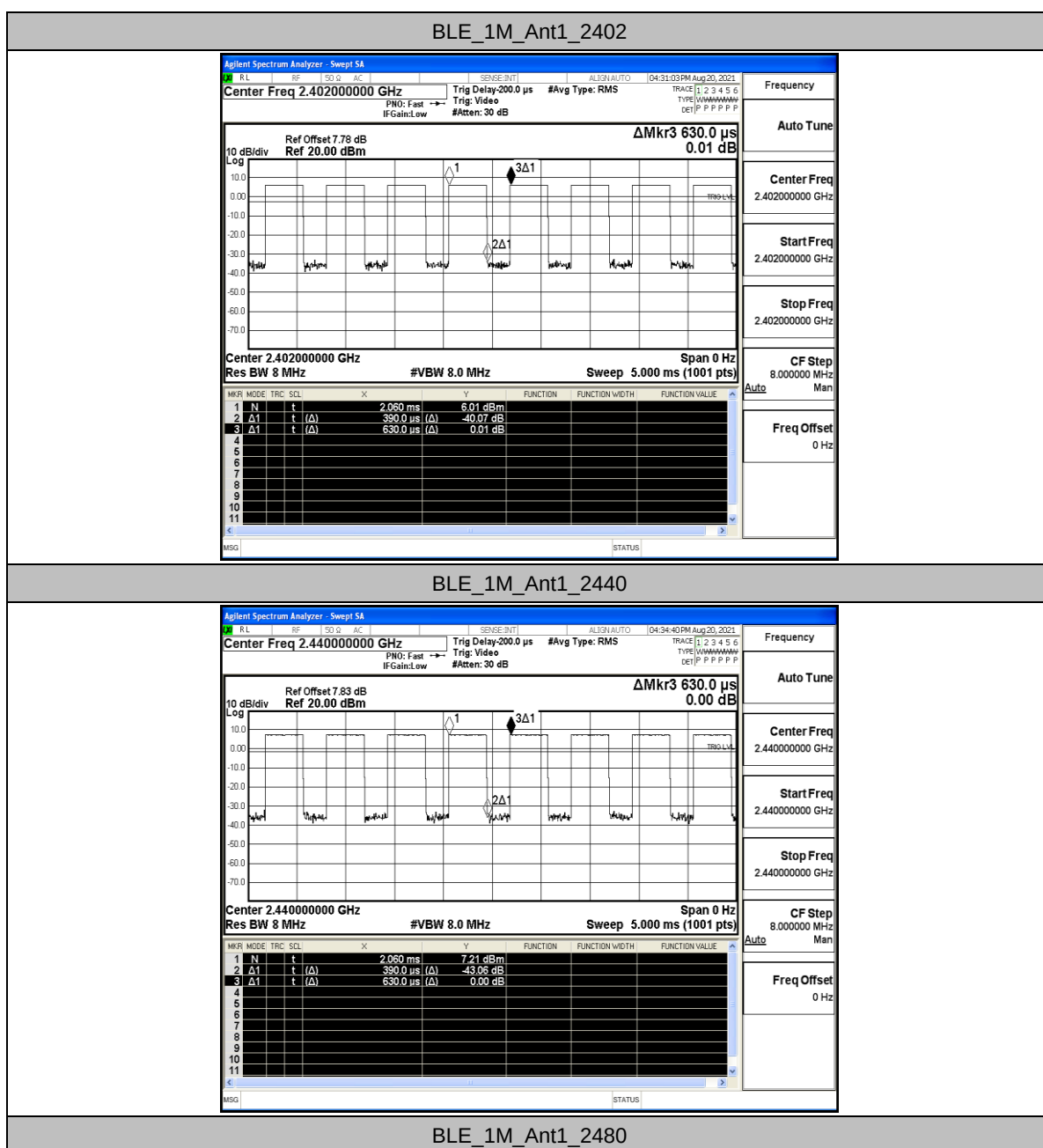


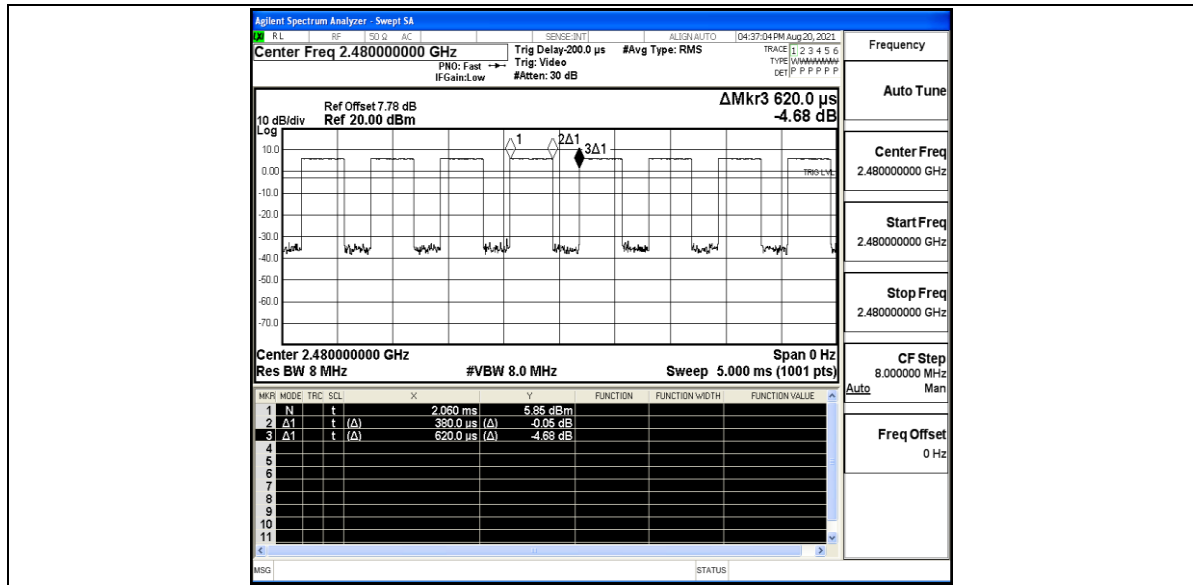
## A.6 Duty Cycle

### Test Result

| TestMode | Antenna | Channel | ON Time<br>[ms] | Period<br>[ms] | X      | DC<br>[%] | xFactor | Limit | Verdict |
|----------|---------|---------|-----------------|----------------|--------|-----------|---------|-------|---------|
| BLE_1M   | Ant1    | 2402    | 0.39            | 0.63           | 0.6190 | 61.90     | 2.08    | ---   | PASS    |
|          |         | 2440    | 0.39            | 0.63           | 0.6190 | 61.90     | 2.08    | ---   | PASS    |
|          |         | 2480    | 0.38            | 0.62           | 0.6129 | 61.29     | 2.13    | ---   | PASS    |

### Test Graphs







## A.7 Emissions in Restricted Bands

### Test Result

| TestMode | Antenna | ChName | Channel | Detector | Freq.<br>[MHz] | Result<br>[dBm] | Limit<br>[dBm] | Result<br>[dBuV/m] | Limit<br>[dBuV/m] | Verdict |
|----------|---------|--------|---------|----------|----------------|-----------------|----------------|--------------------|-------------------|---------|
| BLE_1M   | Ant1    | Low    | 2402    | AV       | 2310.000       | -48.46          | ≤-41.20        | 46.74              | ≤54               | PASS    |
|          |         |        |         | AV       | 2389.565       | -47.5           | ≤-41.20        | 47.70              | ≤54               | PASS    |
|          |         |        |         | AV       | 2390.000       | -47.93          | ≤-41.20        | 47.27              | ≤54               | PASS    |
|          |         |        |         | Peak     | 2310.000       | -40.07          | ≤-21.20        | 55.13              | ≤74               | PASS    |
|          |         |        |         | Peak     | 2368.250       | -38.88          | ≤-21.20        | 56.32              | ≤74               | PASS    |
|          |         |        |         | Peak     | 2390.000       | -41.69          | ≤-21.20        | 53.51              | ≤74               | PASS    |
|          |         | High   | 2480    | AV       | 2483.500       | -45.89          | ≤-41.20        | 49.31              | ≤54               | PASS    |
|          |         |        |         | AV       | 2483.520       | -45.89          | ≤-41.20        | 49.31              | ≤54               | PASS    |
|          |         |        |         | AV       | 2500.000       | -47.52          | ≤-41.20        | 47.68              | ≤54               | PASS    |
|          |         |        |         | Peak     | 2483.500       | -40.89          | ≤-21.20        | 54.31              | ≤74               | PASS    |
|          |         |        |         | Peak     | 2484.560       | -38.3           | ≤-21.20        | 56.90              | ≤74               | PASS    |
|          |         |        |         | Peak     | 2500.000       | -40.95          | ≤-21.20        | 54.25              | ≤74               | PASS    |

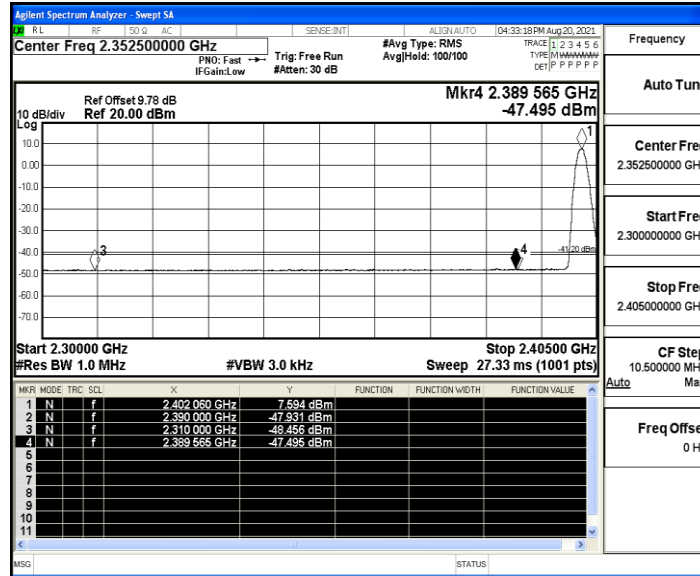
Note:

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.

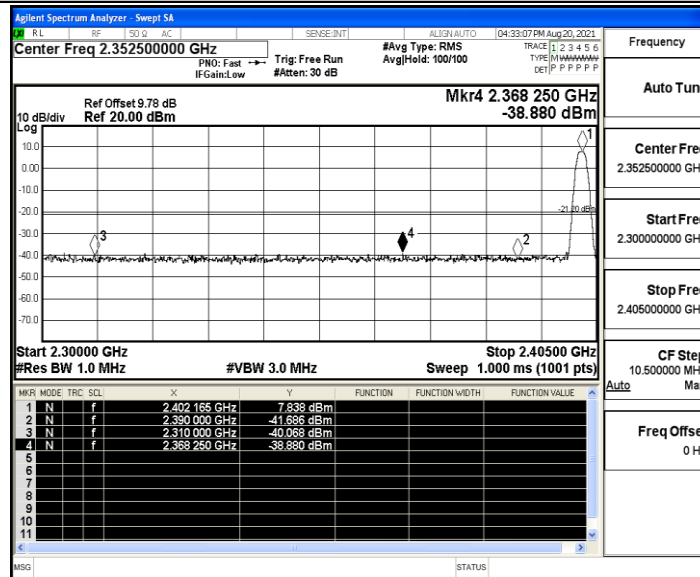


## Test Graphs

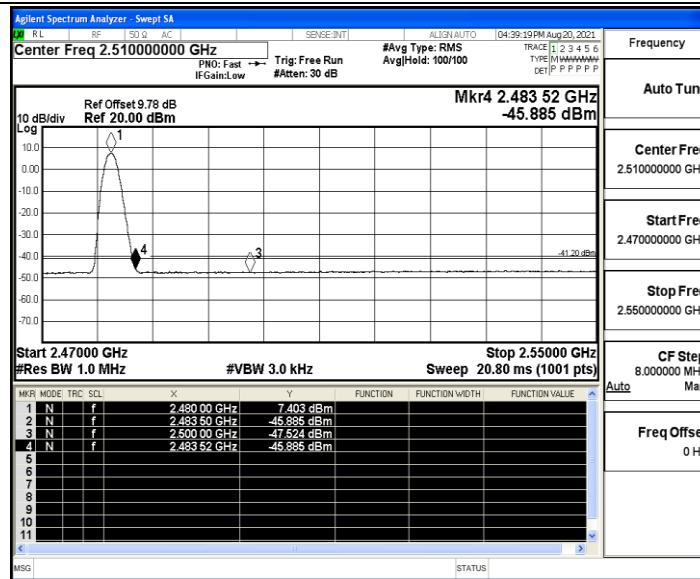
BLE\_1M\_Ant1\_Low\_2402\_AV



BLE\_1M\_Ant1\_Low\_2402\_Peak



BLE\_1M\_Ant1\_High\_2480\_AV



BLE\_1M\_Ant1\_High\_2480\_Peak

