

## Appendix Test Data for BT(BLE) (Conducted Measurement)

Product Name: Alpha Egg Dictionary Pen

Trade Mark: ALPHA EGG

Test Model: TYP-AIR10

FCC ID: 2A7P5TYP-AIR10

### Environmental Conditions

|                    |           |
|--------------------|-----------|
| Temperature:       | 25.5°C    |
| Relative Humidity: | 55%       |
| ATM Pressure:      | 100.0 kPa |
| Test Engineer:     | Anna Hu   |
| Supervised by:     | Hugo Chen |
| NOTE               | N/A       |

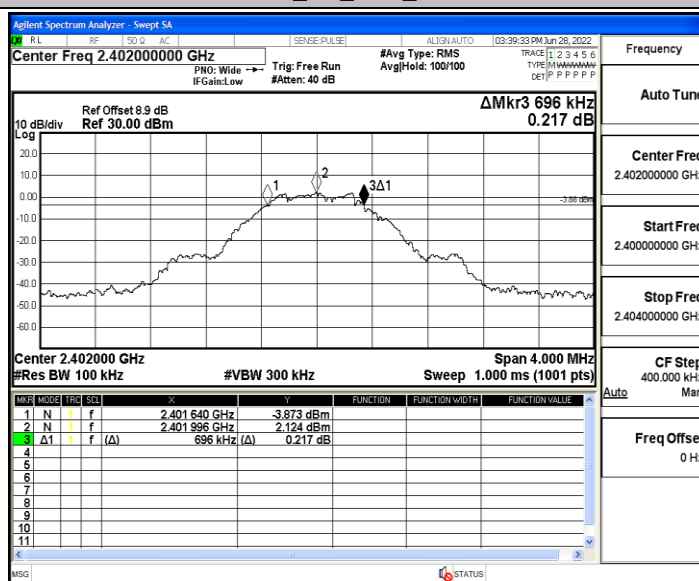
## Appendix A: DTS Bandwidth

### Test Result

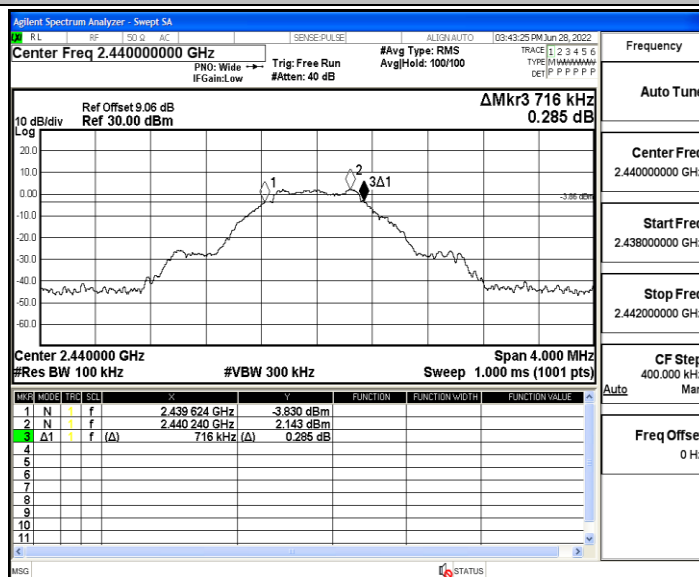
| TestMode | Antenna | Channel | DTS BW<br>[MHz] | FL[MHz]  | FH[MHz]  | Limit[MHz] | Verdict |
|----------|---------|---------|-----------------|----------|----------|------------|---------|
| BLE_1M   | Ant1    | 2402    | 0.696           | 2401.640 | 2402.336 | 0.5        | PASS    |
|          |         | 2440    | 0.716           | 2439.624 | 2440.340 | 0.5        | PASS    |
|          |         | 2480    | 0.696           | 2479.652 | 2480.348 | 0.5        | PASS    |

## Test Graphs

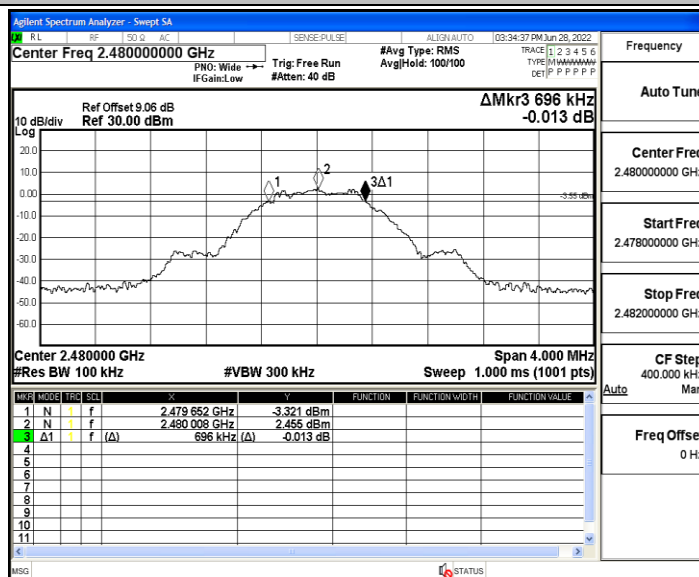
BLE\_1M\_Ant1\_2402



BLE\_1M\_Ant1\_2440



BLE\_1M\_Ant1\_2480



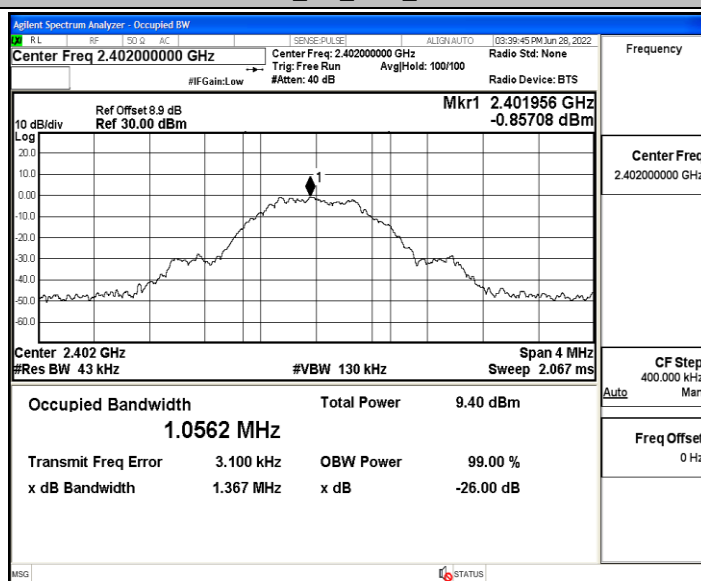
## Appendix B: Occupied Channel Bandwidth

### Test Result

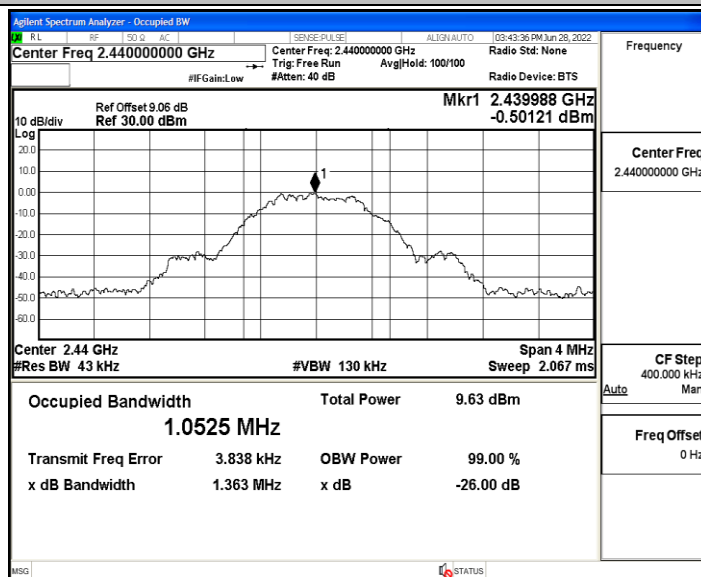
| TestMode | Antenna | Channel | OCB [MHz] | FL[MHz]  | FH[MHz]  | Limit[MHz] | Verdict |
|----------|---------|---------|-----------|----------|----------|------------|---------|
| BLE_1M   | Ant1    | 2402    | 1.0562    | 2401.475 | 2402.531 | ---        | ---     |
|          |         | 2440    | 1.0525    | 2439.478 | 2440.530 | ---        | ---     |
|          |         | 2480    | 1.0485    | 2479.481 | 2480.530 | ---        | ---     |

## Test Graphs

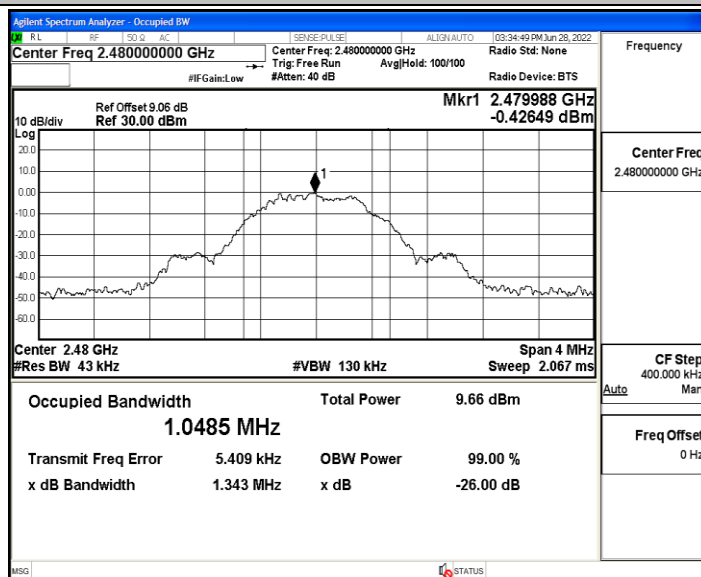
BLE\_1M\_Ant1\_2402



BLE\_1M\_Ant1\_2440



BLE\_1M\_Ant1\_2480



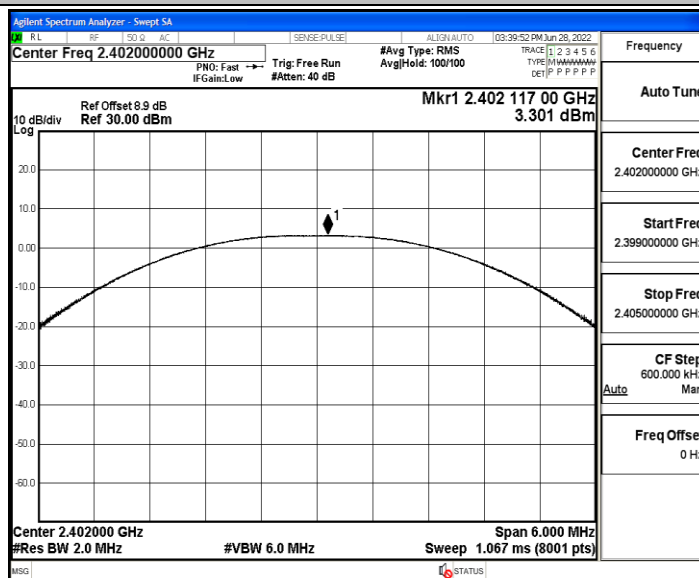
## Appendix C: Maximum Peak conducted output power

### Test Result

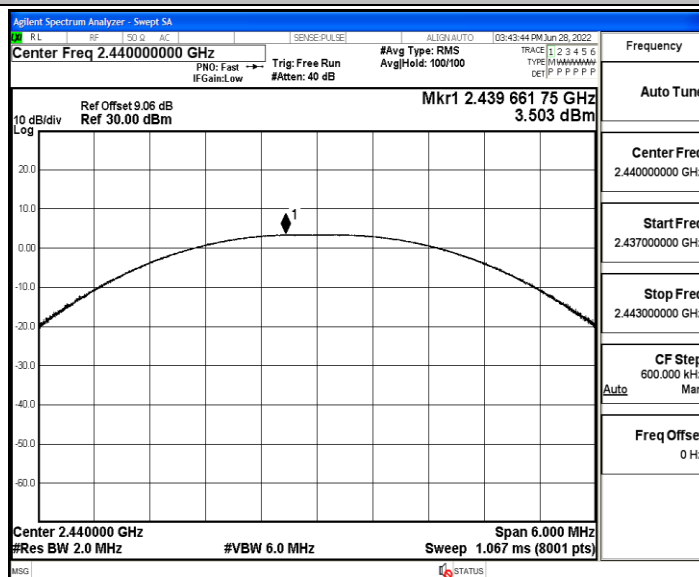
| TestMode | Antenna | Channel | Result[dBm] | Limit[dBm] | Verdict |
|----------|---------|---------|-------------|------------|---------|
| BLE_1M   | Ant1    | 2402    | 3.3         | ≤30        | PASS    |
|          |         | 2440    | 3.5         | ≤30        | PASS    |
|          |         | 2480    | 3.63        | ≤30        | PASS    |

## Test Graphs

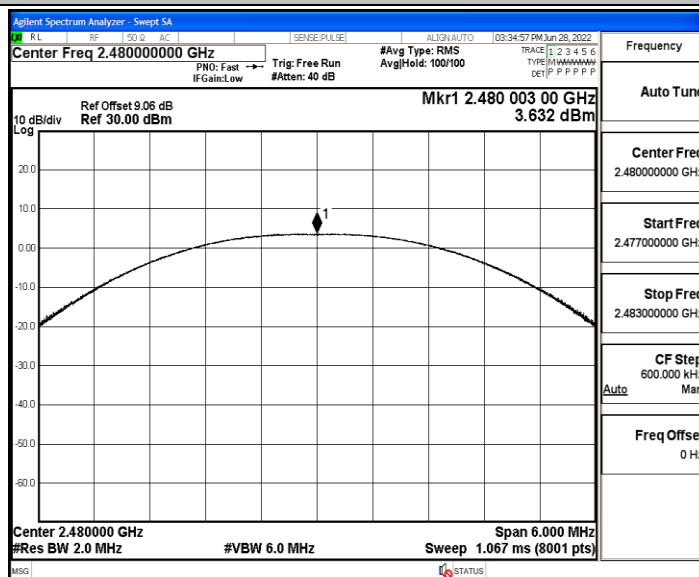
BLE\_1M\_Ant1\_2402



BLE\_1M\_Ant1\_2440



BLE\_1M\_Ant1\_2480



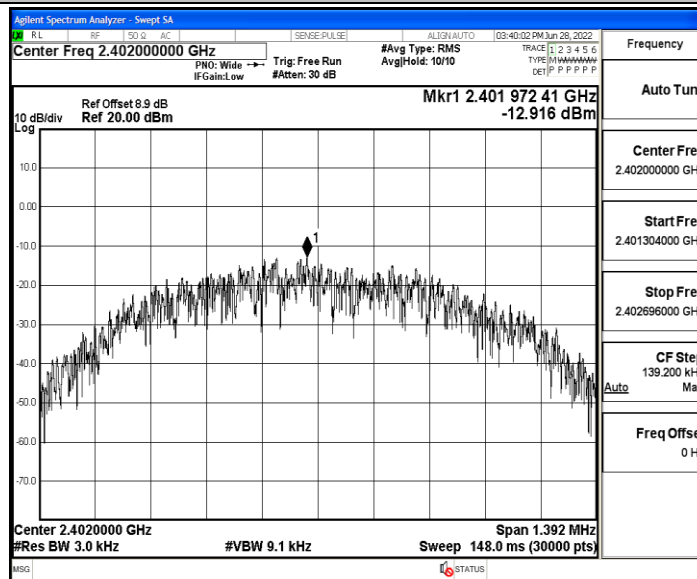
## Appendix D: Maximum power spectral density

### Test Result

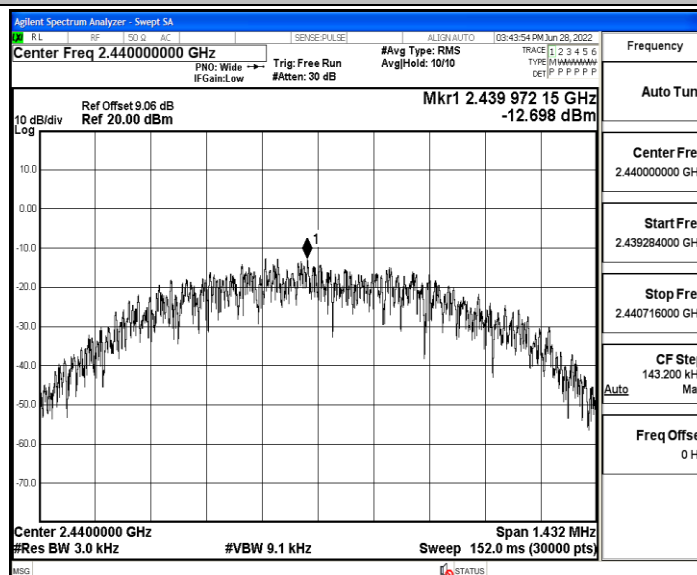
| TestMode | Antenna | Channel | Result[dBm/3-100kHz] | Limit[dBm/3kHz] | Verdict |
|----------|---------|---------|----------------------|-----------------|---------|
| BLE_1M   | Ant1    | 2402    | -12.92               | ≤8.00           | PASS    |
|          |         | 2440    | -12.7                | ≤8.00           | PASS    |
|          |         | 2480    | -12.53               | ≤8.00           | PASS    |

## Test Graphs

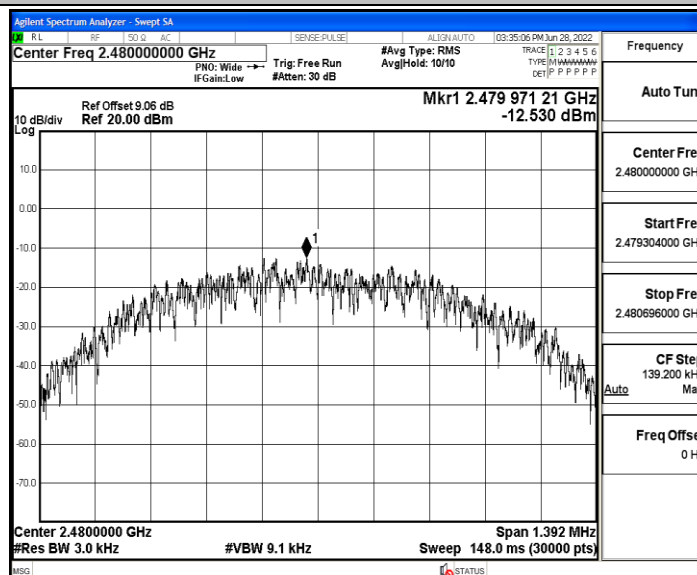
BLE\_1M\_Ant1\_2402



BLE\_1M\_Ant1\_2440



BLE\_1M\_Ant1\_2480

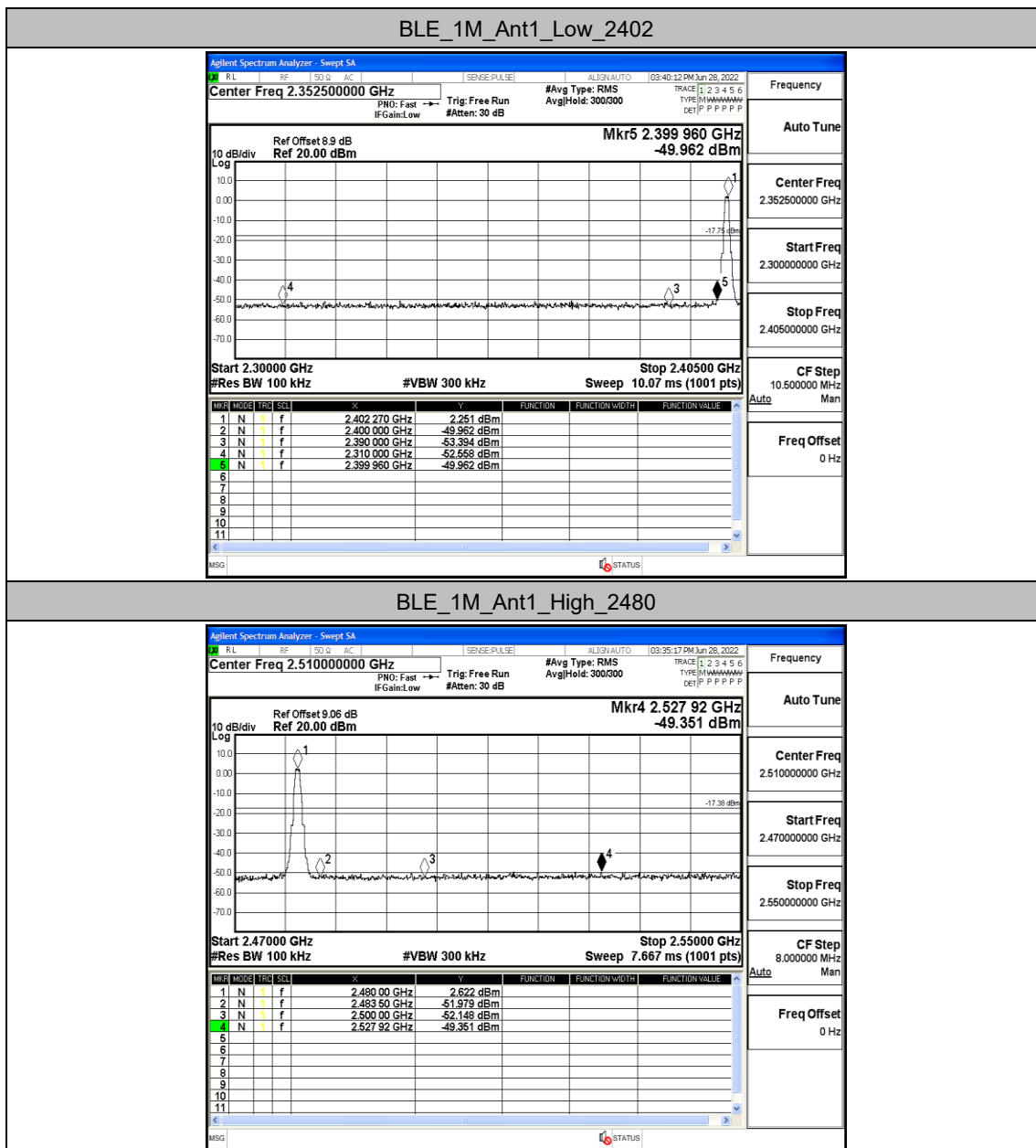


## Appendix E: Band edge measurements

### Test Result

| TestMode | Antenna | ChName | Channel | RefLevel[dBm] | Result[dBm] | Limit[dBm] | Verdict |
|----------|---------|--------|---------|---------------|-------------|------------|---------|
| BLE_1M   | Ant1    | Low    | 2402    | 2.25          | -49.96      | ≤-17.75    | PASS    |
|          |         | High   | 2480    | 2.62          | -49.35      | ≤-17.38    | PASS    |

## Test Graphs



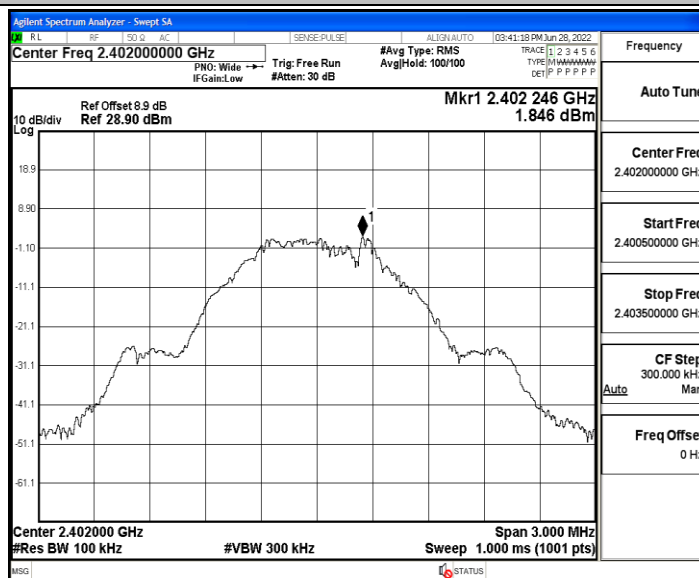
## Appendix F: Conducted Spurious Emission

### Test Result

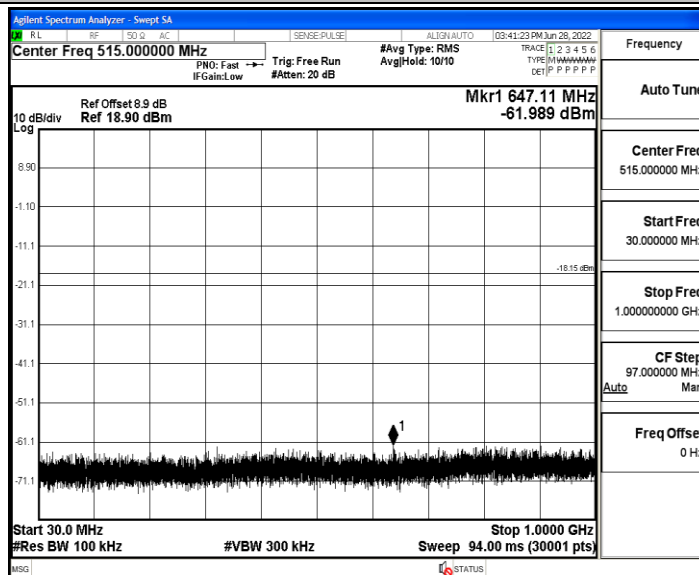
| TestMode | Antenna | Channel | FreqRange<br>[MHz] | RefLevel<br>[dBm] | Result[dBm] | Limit[dBm] | Verdict |
|----------|---------|---------|--------------------|-------------------|-------------|------------|---------|
| BLE_1M   | Ant1    | 2402    | Reference          | 1.85              | 1.85        | ---        | PASS    |
|          |         |         | 30~1000            | 1.85              | -61.99      | ≤-18.15    | PASS    |
|          |         |         | 1000~26500         | 1.85              | -50.19      | ≤-18.15    | PASS    |
|          |         | 2440    | Reference          | 2.30              | 2.30        | ---        | PASS    |
|          |         |         | 30~1000            | 2.30              | -61.37      | ≤-17.7     | PASS    |
|          |         |         | 1000~26500         | 2.30              | -51.48      | ≤-17.7     | PASS    |
|          |         | 2480    | Reference          | 2.45              | 2.45        | ---        | PASS    |
|          |         |         | 30~1000            | 2.45              | -61.69      | ≤-17.55    | PASS    |
|          |         |         | 1000~26500         | 2.45              | -51.09      | ≤-17.55    | PASS    |

## Test Graphs

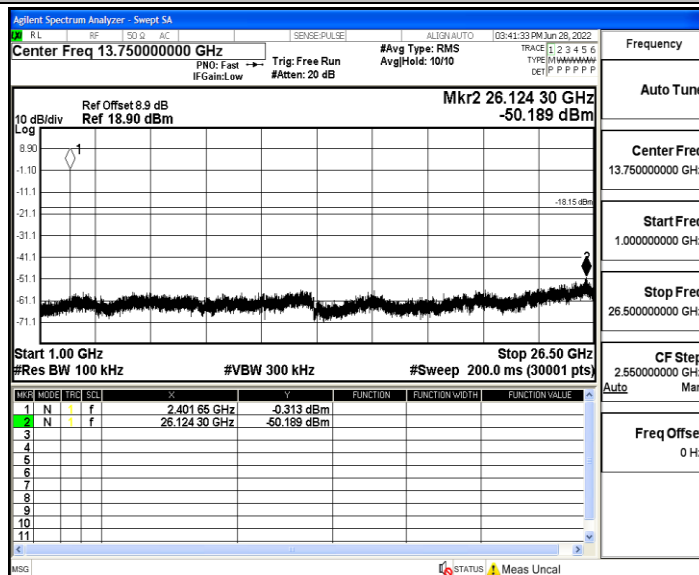
BLE\_1M\_Ant1\_2402\_0~Reference



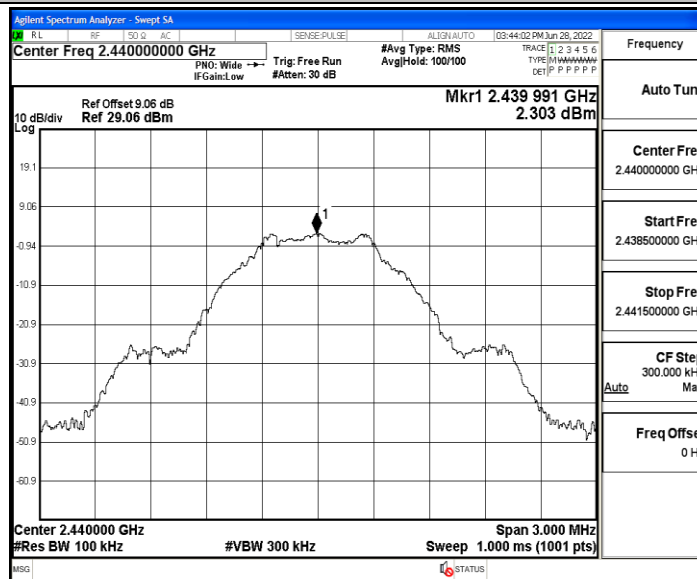
BLE\_1M\_Ant1\_2402\_30~1000



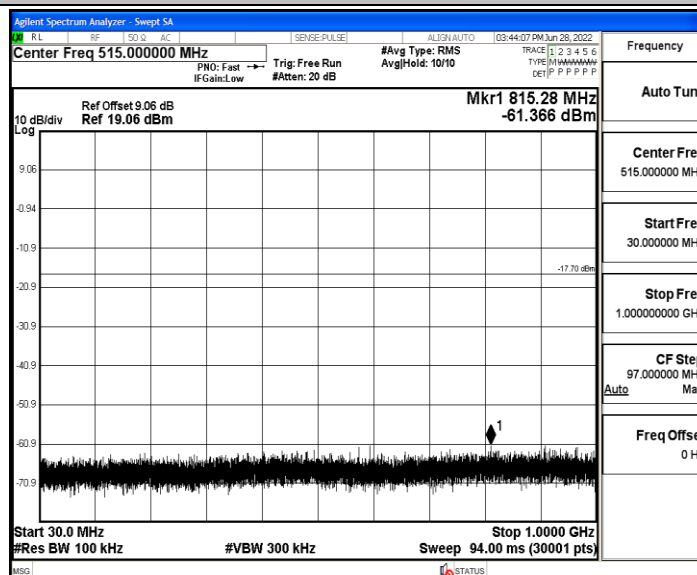
BLE\_1M\_Ant1\_2402\_1000~26500



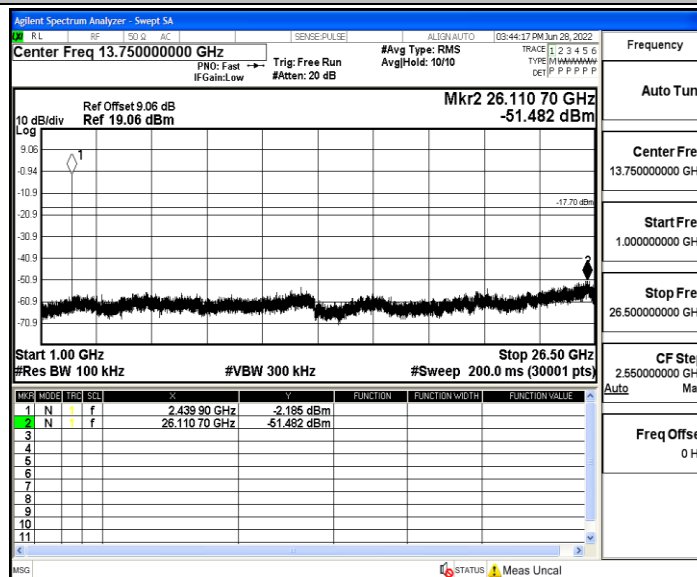
## BLE\_1M\_Ant1\_2440\_0~Reference



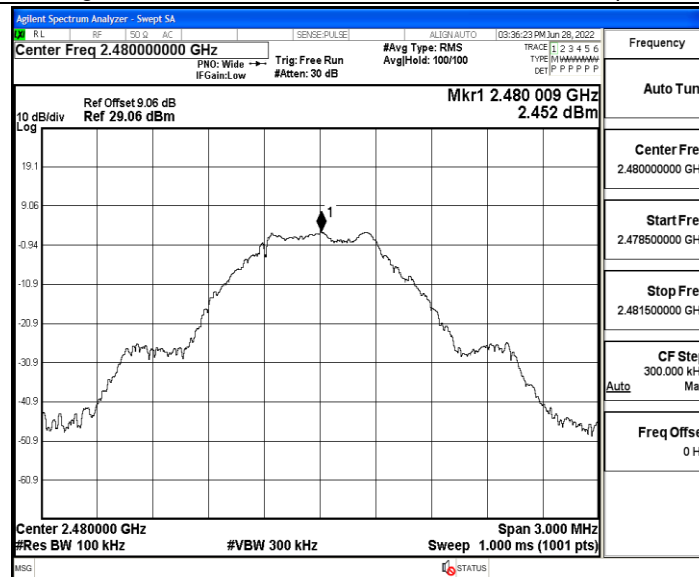
## BLE\_1M\_Ant1\_2440\_30~1000



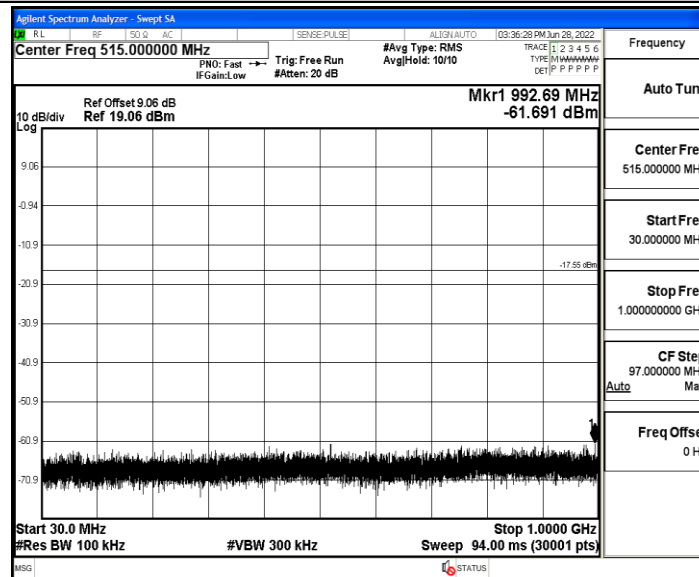
## BLE\_1M\_Ant1\_2440\_1000~26500



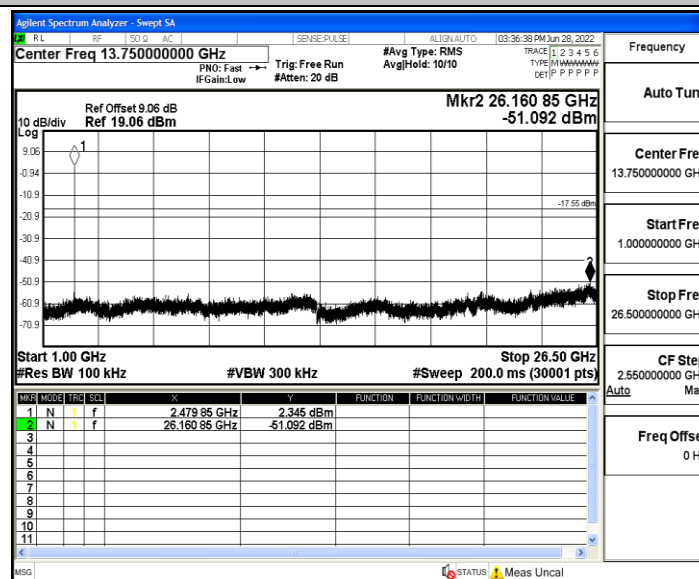
## BLE\_1M\_Ant1\_2480\_0~Reference



BLE\_1M\_Ant1\_2480\_30~1000



BLE\_1M\_Ant1\_2480\_1000~26500



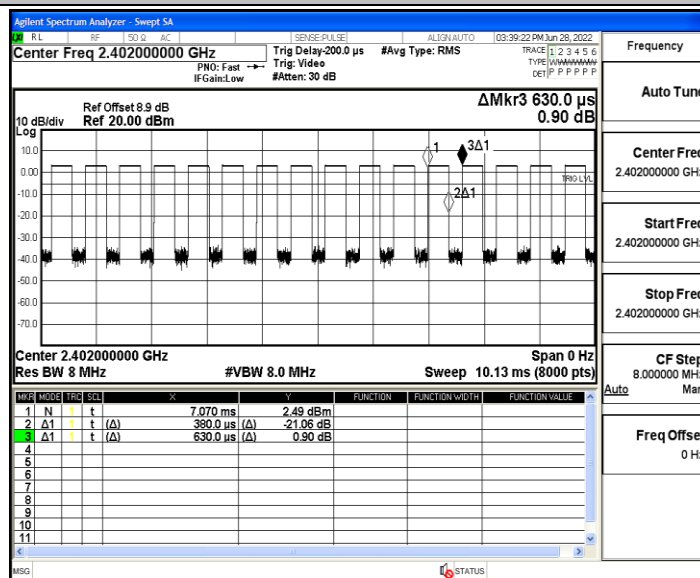
## Appendix G: Duty Cycle

### Test Result

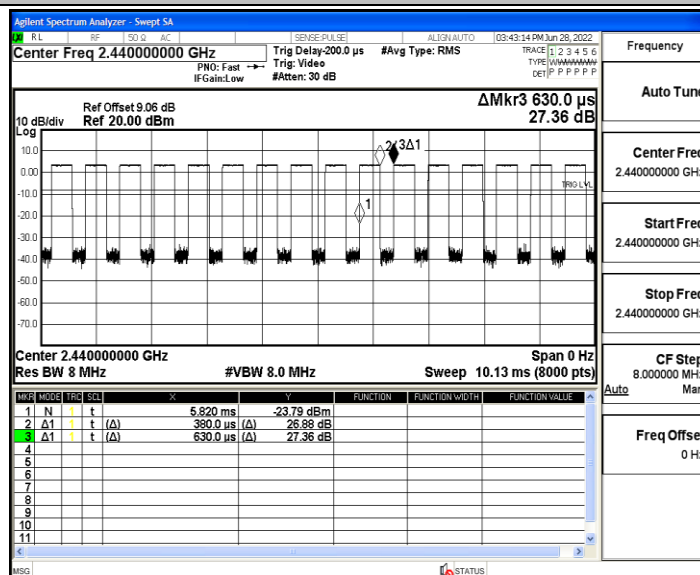
| TestMode | Antenna | Channel | Transmission Duration [ms] | Transmission Period [ms] | Duty Cycle [%] | 1/T[kHz] |
|----------|---------|---------|----------------------------|--------------------------|----------------|----------|
| BLE_1M   | Ant1    | 2402    | 0.38                       | 0.63                     | 60.32          | 2.63     |
|          |         | 2440    | 0.38                       | 0.63                     | 60.32          | 2.63     |
|          |         | 2480    | 0.38                       | 0.63                     | 60.32          | 2.63     |

## Test Graphs

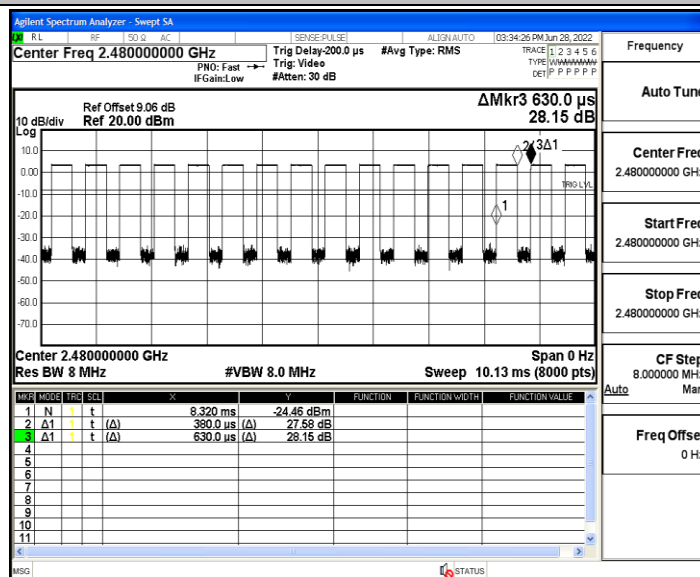
BLE\_1M\_Ant1\_2402



BLE\_1M\_Ant1\_2440



BLE\_1M\_Ant1\_2480



## Appendix H: Emissions in Restricted Bands

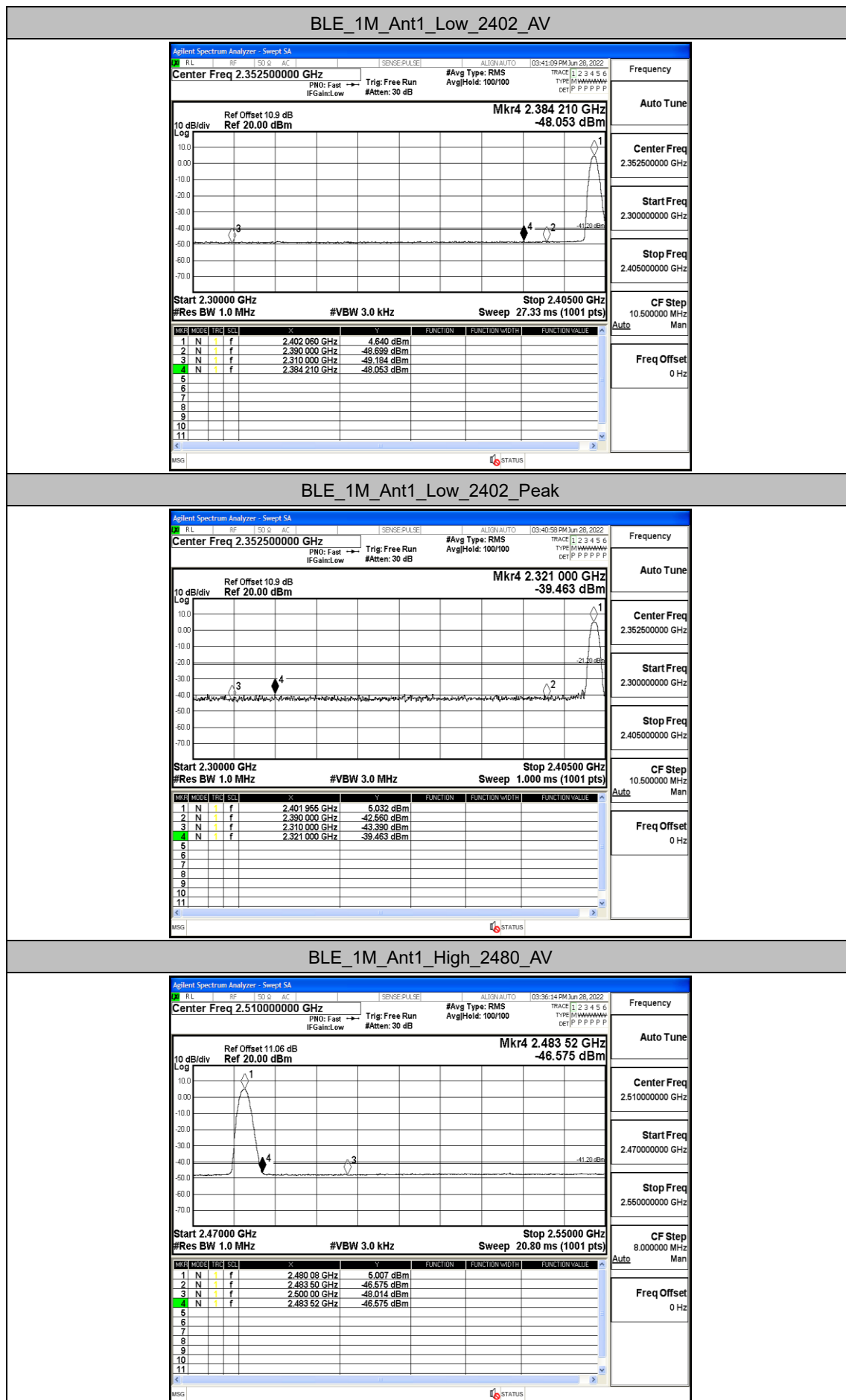
### Test Result

| TestMode | Antenna | ChName | Channel | Detector | Freq.<br>[MHz] | Result<br>[dBm] | Limit<br>[dBm] | Verdict |
|----------|---------|--------|---------|----------|----------------|-----------------|----------------|---------|
| BLE_1M   | Ant1    | Low    | 2402    | AV       | 2310.000       | -49.18          | ≤-41.20        | PASS    |
|          |         |        |         | AV       | 2384.210       | -48.05          | ≤-41.20        | PASS    |
|          |         |        |         | AV       | 2390.000       | -48.7           | ≤-41.20        | PASS    |
|          |         |        |         | Peak     | 2310.000       | -43.39          | ≤-21.20        | PASS    |
|          |         |        |         | Peak     | 2321.000       | -39.46          | ≤-21.20        | PASS    |
|          |         |        |         | Peak     | 2390.000       | -42.56          | ≤-21.20        | PASS    |
|          |         | High   | 2480    | AV       | 2483.500       | -46.58          | ≤-41.20        | PASS    |
|          |         |        |         | AV       | 2483.520       | -46.58          | ≤-41.20        | PASS    |
|          |         |        |         | AV       | 2500.000       | -48.01          | ≤-41.20        | PASS    |
|          |         |        |         | Peak     | 2483.500       | -40.36          | ≤-21.20        | PASS    |
|          |         |        |         | Peak     | 2491.040       | -38.47          | ≤-21.20        | PASS    |
|          |         |        |         | Peak     | 2500.000       | -41.38          | ≤-21.20        | PASS    |

Note:

1. The Antenna Gain is compensated in the graph with 2dBi and Antenna Gain which is Higher.
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\_High\_2480\_Peak

