# Appendix A

## RF Test Data for BLE (Conducted Measurement)

**Product Name: Pawfit Location and Activity Tracker (Pawfit pet Tracker)**

**Test Model: TR3A**

**Environmental Conditions**

| | |
|---|---|
| Temperature: | 23.8° C |
| Relative Humidity: | 52.2% |
| ATM Pressure: | 100.0 kPa |
| Test Engineer: | Ling Zhu |
| Supervised by: | Li Huan |

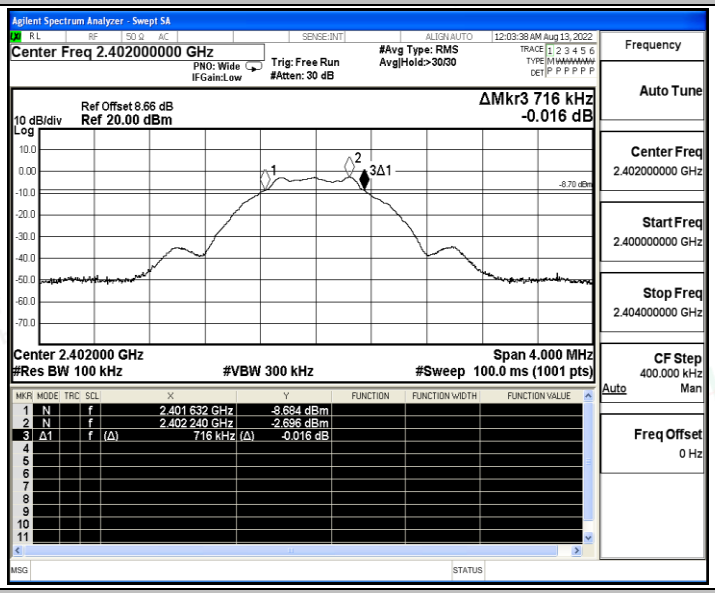
# A.1 DTS Bandwidth

## Test Result

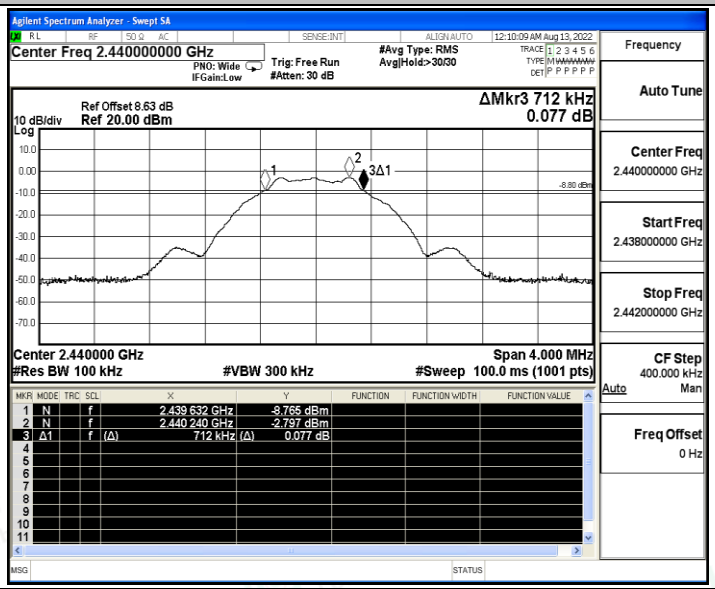
| TestMode | Antenna | Channel | DTS BW [MHz] | FL[MHz] | FH[MHz] | Limit[MHz] | Verdict |
|---|---|---|---|---|---|---|---|
| BLE_1M | Ant1 | 2402 | 0.716 | 2401.632 | 2402.348 | 0.5 | PASS |
| | | 2440 | 0.712 | 2439.632 | 2440.344 | 0.5 | PASS |
| | | 2480 | 0.716 | 2479.632 | 2480.348 | 0.5 | PASS |
| BLE_2M | Ant1 | 2402 | 1.152 | 2401.428 | 2402.580 | 0.5 | PASS |
| | | 2440 | 1.160 | 2439.424 | 2440.584 | 0.5 | PASS |
| | | 2480 | 1.152 | 2479.428 | 2480.580 | 0.5 | PASS |

## Test Graphs

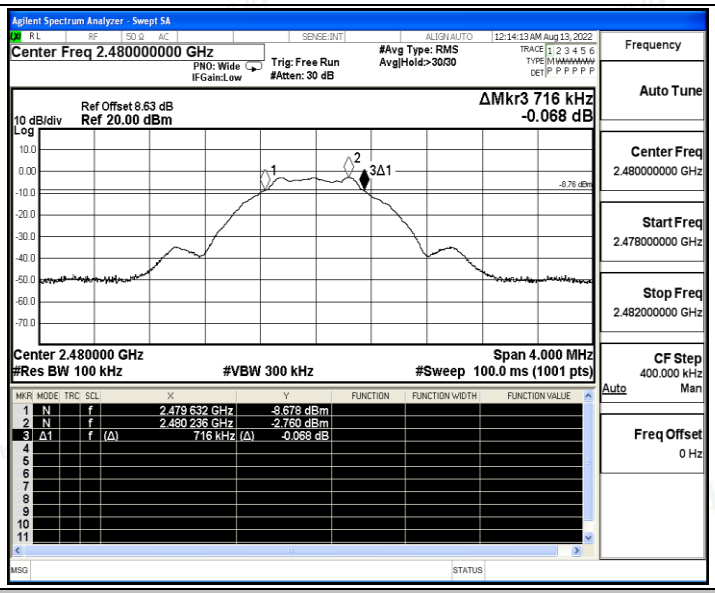
BLE_1M_Ant1_2402



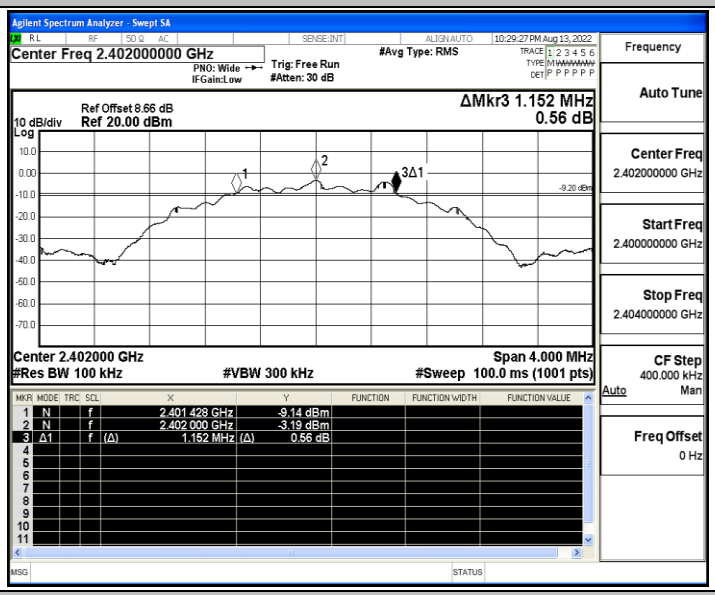

BLE_1M_Ant1_2440



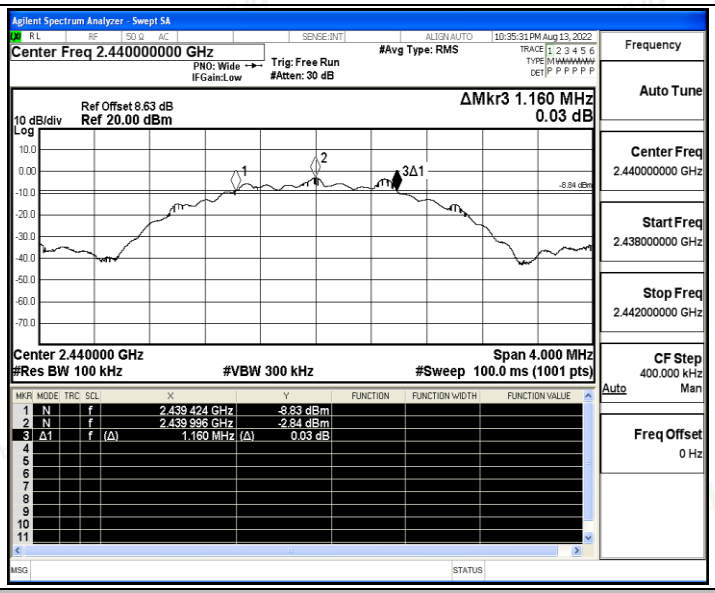

BLE_1M_Ant1_2480



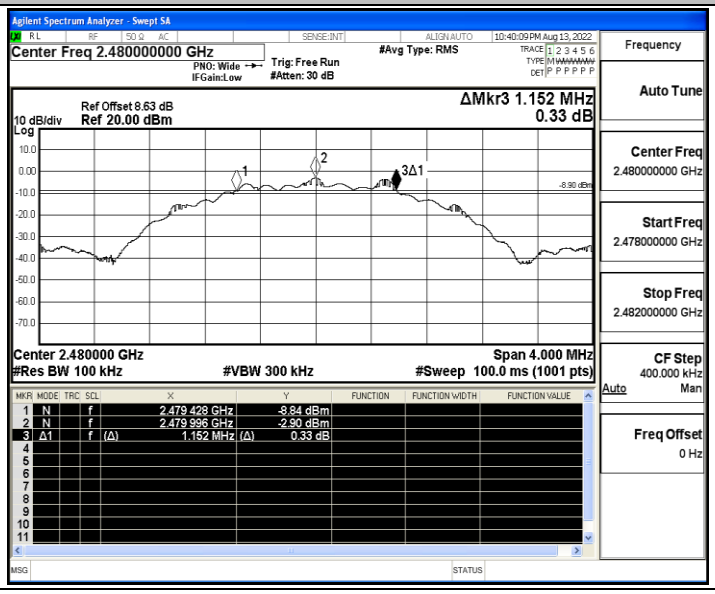

BLE_2M_Ant1_2402




BLE_2M_Ant1_2440




BLE_2M_Ant1_2480



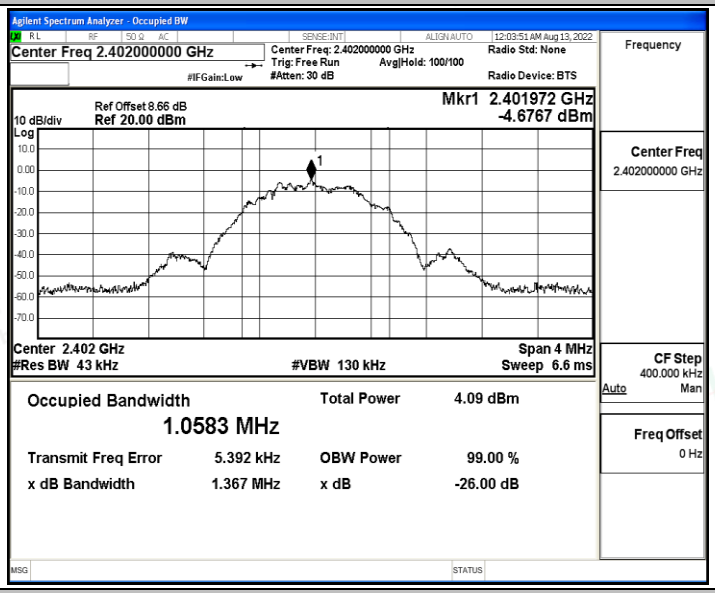
# A.2 Occupied Channel Bandwidth

## Test Result

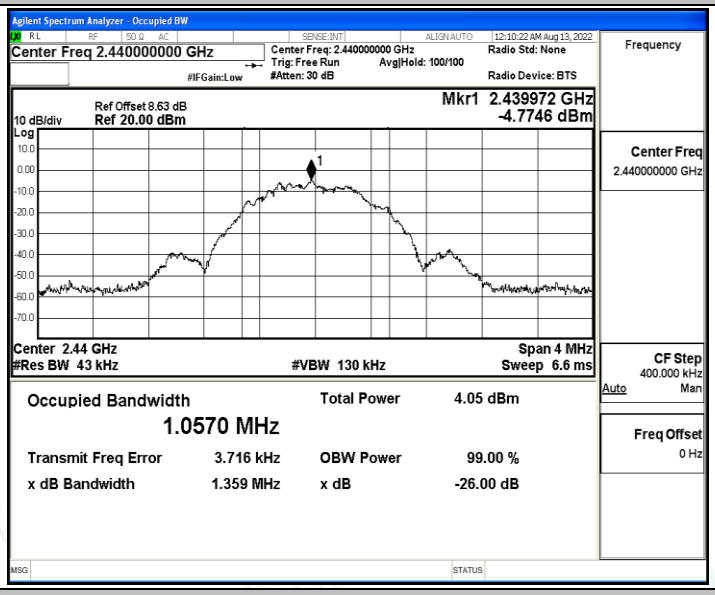
| TestMode | Antenna | Channel | OCB [MHz] | FL[MHz] | FH[MHz] | Limit[MHz] | Verdict |
|---|---|---|---|---|---|---|---|
| BLE_1M | Ant1 | 2402 | 1.0583 | 2401.476 | 2402.535 | --- | --- |
| | | 2440 | 1.0570 | 2439.475 | 2440.532 | --- | --- |
| | | 2480 | 1.0583 | 2479.474 | 2480.532 | --- | --- |
| BLE_2M | Ant1 | 2402 | 2.0755 | 2400.9809 | 2403.0564 | --- | --- |
| | | 2440 | 2.0718 | 2438.9823 | 2441.0541 | --- | --- |
| | | 2480 | 2.0739 | 2478.9797 | 2481.0536 | --- | --- |

## Test Graphs

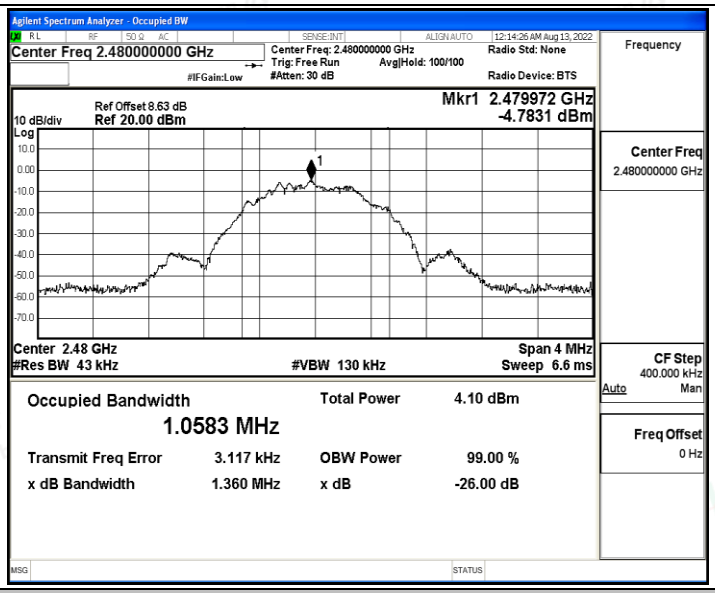
BLE_1M_Ant1_2402



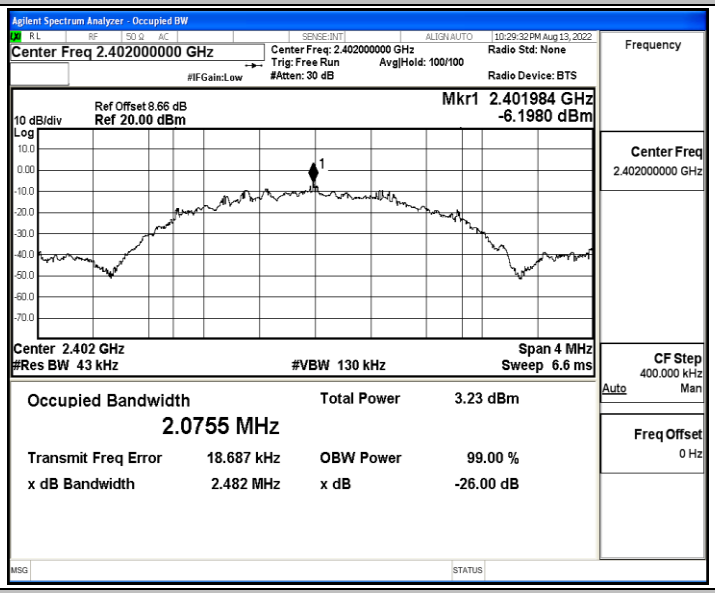

BLE_1M_Ant1_2440



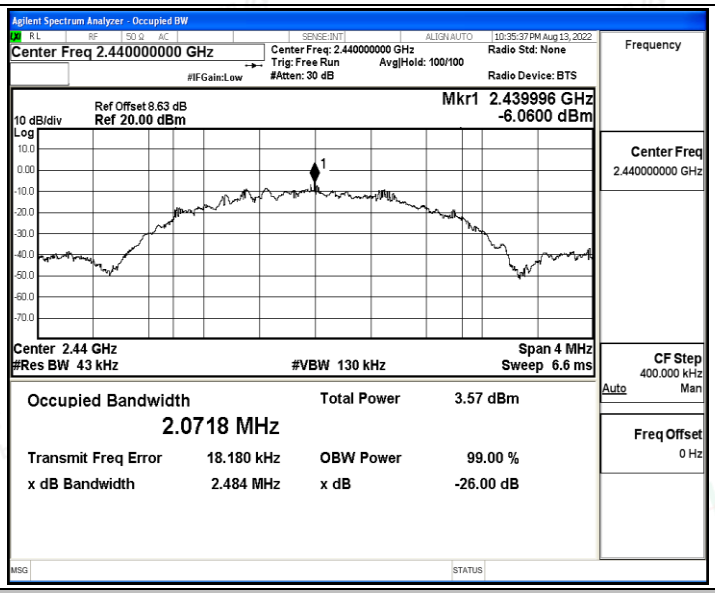

BLE_1M_Ant1_2480



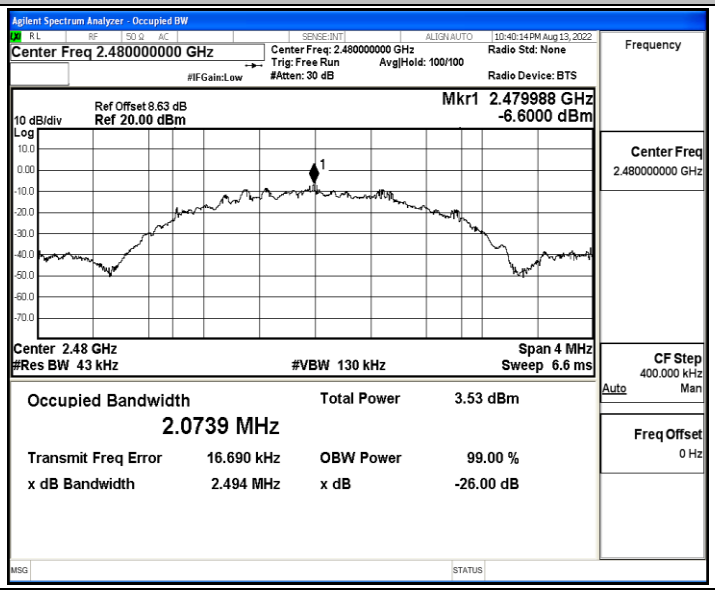

BLE_2M_Ant1_2402




BLE_2M_Ant1_2440




BLE_2M_Ant1_2480



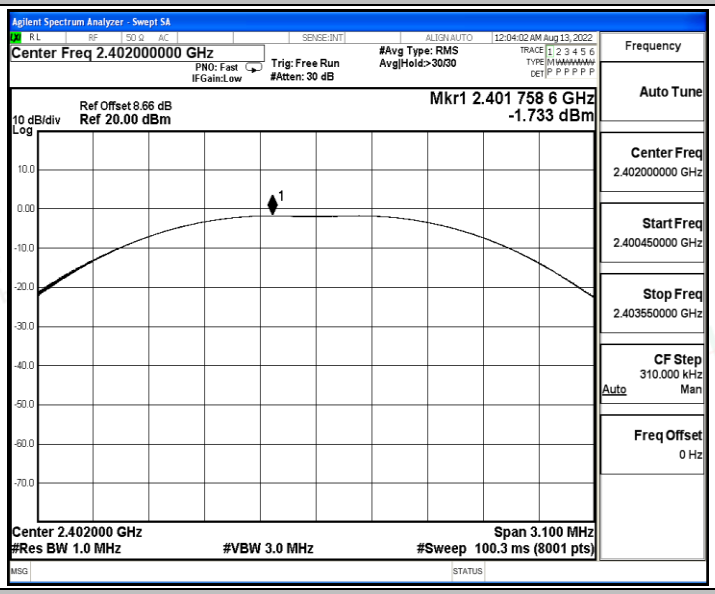
## A.3 Maximum conducted output power

### Test Result

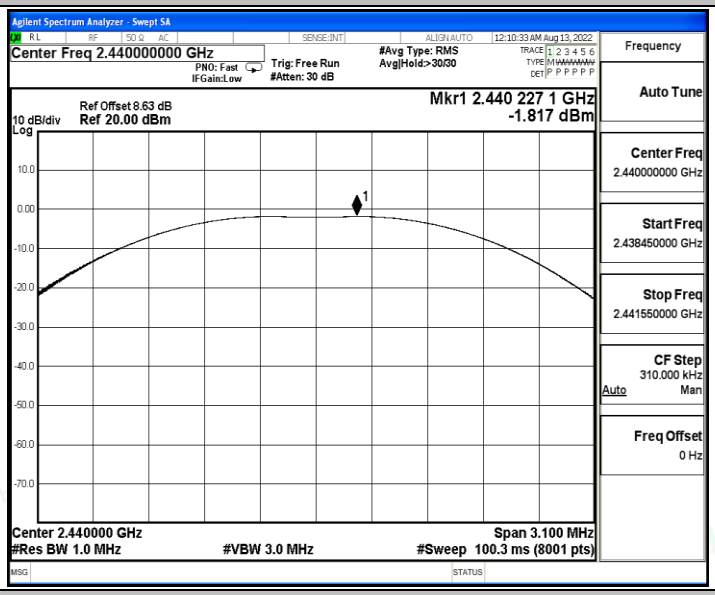
| TestMode | Antenna | Channel | Result[dBm] | Limit[dBm] | Verdict |
|---|---|---|---|---|---|
| BLE_1M | Ant1 | 2402 | -1.73 | ≤30 | PASS |
| | | 2440 | -1.82 | ≤30 | PASS |
| | | 2480 | -1.77 | ≤30 | PASS |
| BLE_2M | Ant1 | 2402 | -2.46 | ≤30 | PASS |
| | | 2440 | -2.11 | ≤30 | PASS |
| | | 2480 | -2.16 | ≤30 | PASS |

## Test Graphs

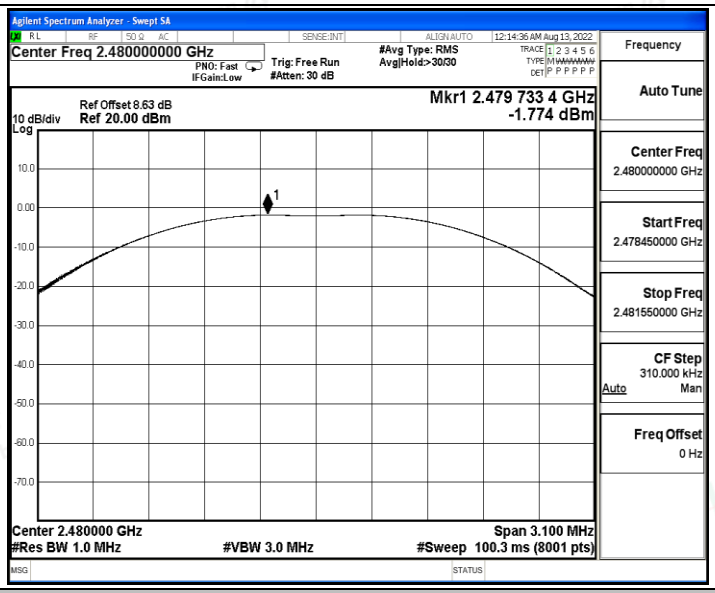
BLE_1M_Ant1_2402



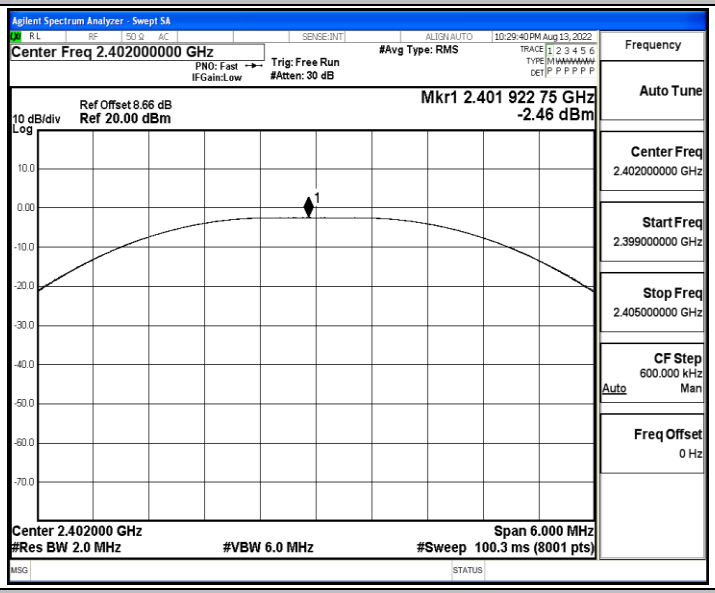

BLE_1M_Ant1_2440



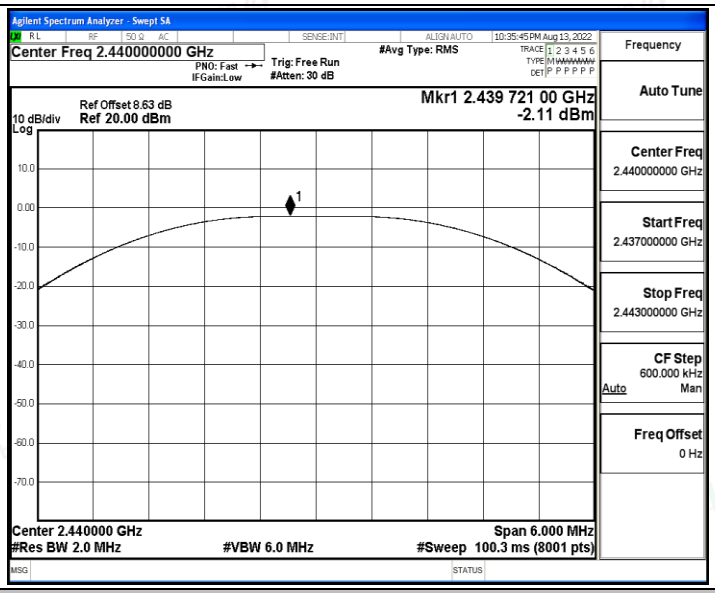

BLE_1M_Ant1_2480



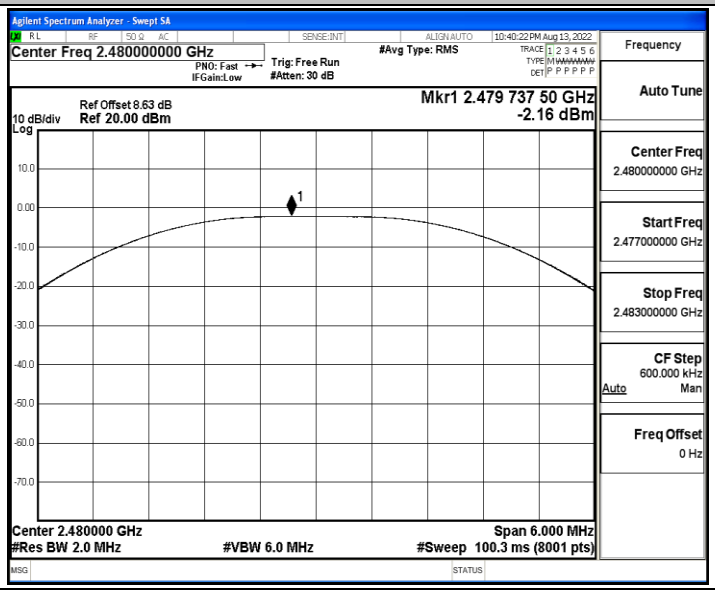

BLE_2M_Ant1_2402




BLE_2M_Ant1_2440




BLE_2M_Ant1_2480



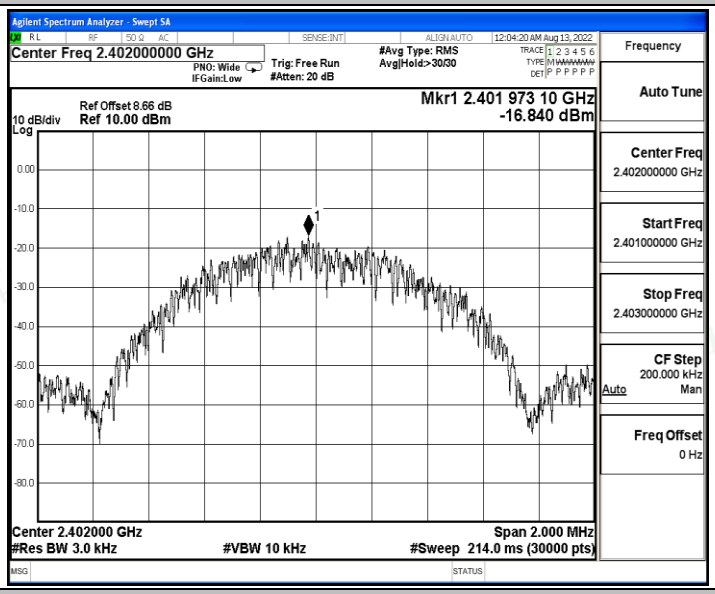
# A.4 Maximum power spectral density

## Test Result

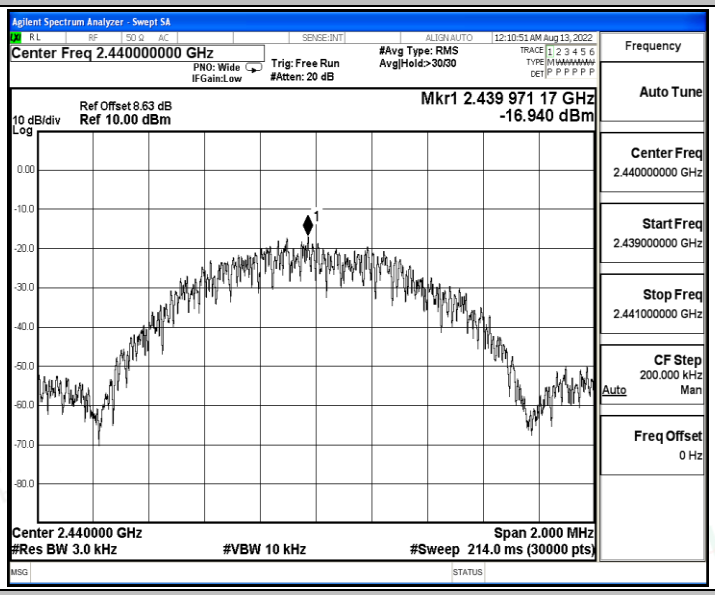
| TestMode | Antenna | Channel | Result[dBm/3-100kHz] | Limit[dBm/3kHz] | Verdict |
|---|---|---|---|---|---|
| BLE_1M | Ant1 | 2402 | -16.84 | ≤8.00 | PASS |
| | | 2440 | -16.94 | ≤8.00 | PASS |
| | | 2480 | -16.88 | ≤8.00 | PASS |
| BLE_2M | Ant1 | 2402 | -20.97 | ≤8.00 | PASS |
| | | 2440 | -20.48 | ≤8.00 | PASS |
| | | 2480 | -21.56 | ≤8.00 | PASS |

## Test Graphs

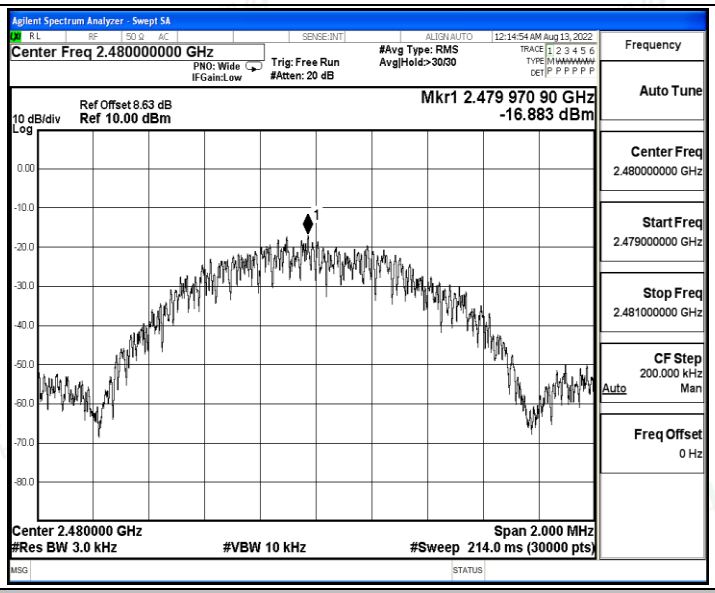
BLE_1M_Ant1_2402



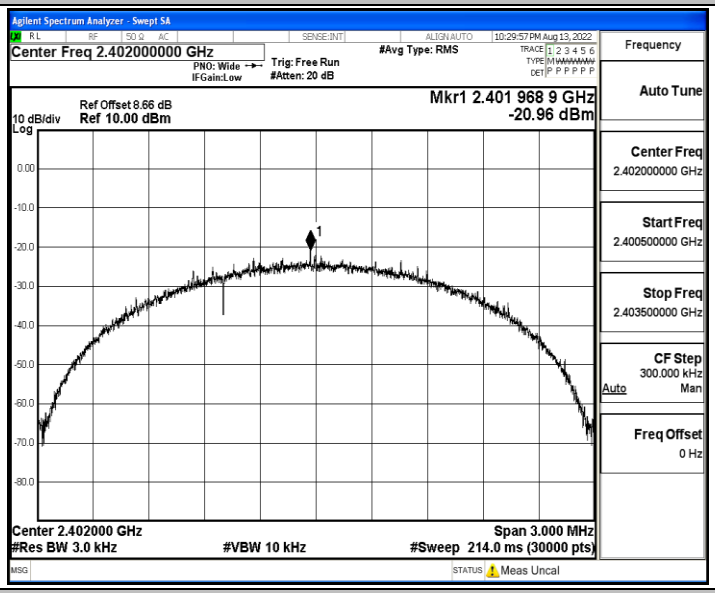

BLE_1M_Ant1_2440



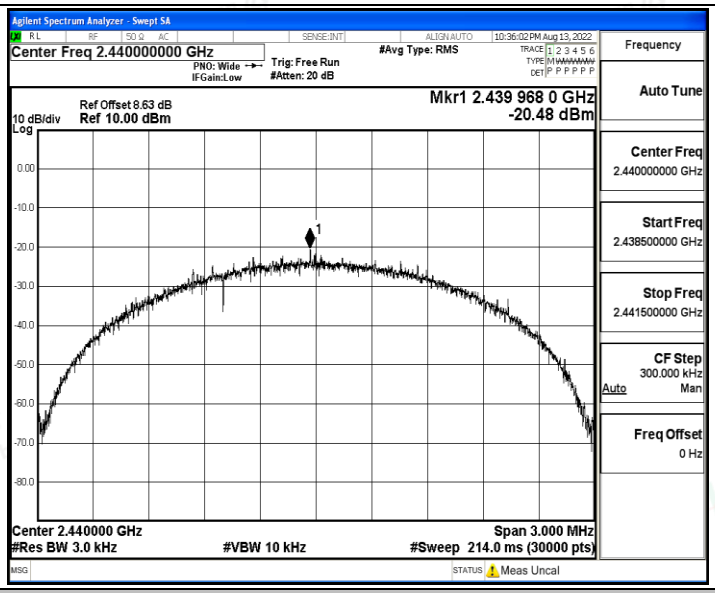

BLE_1M_Ant1_2480



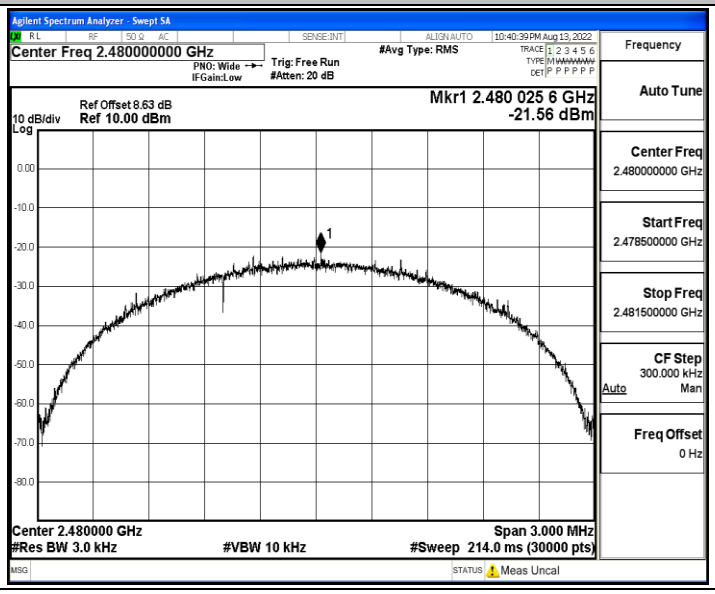

BLE_2M_Ant1_2402




BLE_2M_Ant1_2440




BLE_2M_Ant1_2480



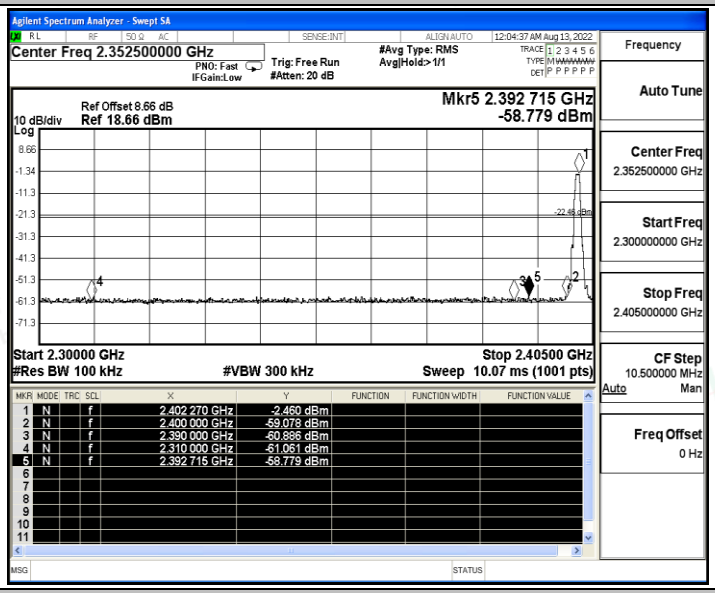
# A.5 Band edge measurements

## Test Result

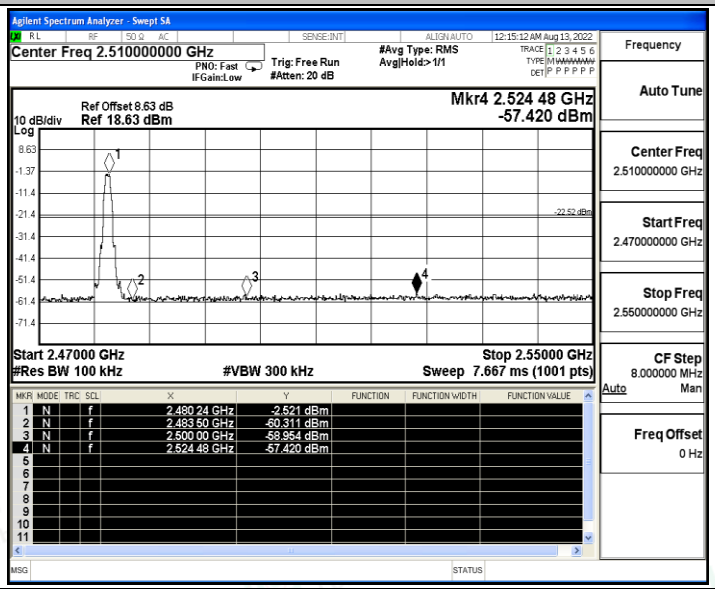
| TestMode | Antenna | ChName | Channel | RefLevel[dBm] | Result[dBm] | Limit[dBm] | Verdict |
|---|---|---|---|---|---|---|---|
| BLE_1M | Ant1 | Low | 2402 | -2.46 | -58.78 | ≤-22.46 | PASS |
| | | High | 2480 | -2.52 | -57.42 | ≤-22.52 | PASS |
| BLE_2M | Ant1 | Low | 2402 | -5.11 | -38.37 | ≤-25.11 | PASS |
| | | High | 2480 | -4.91 | -58.59 | ≤-24.91 | PASS |

## Test Graphs

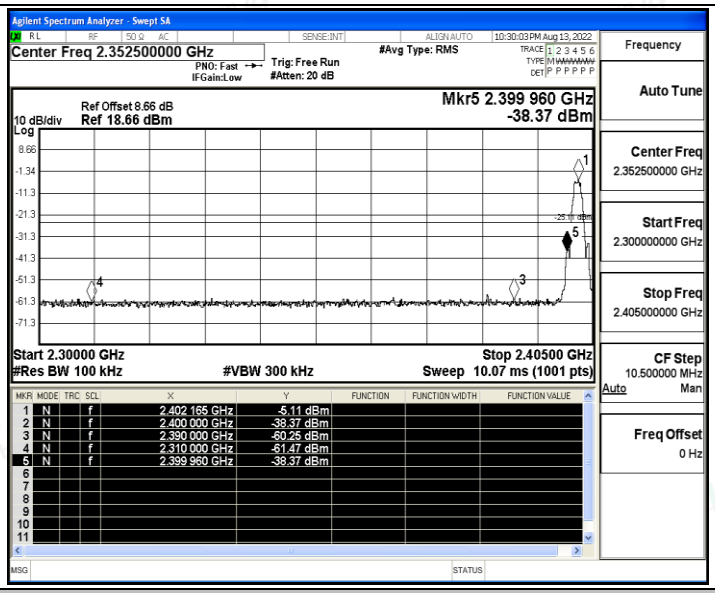
BLE_1M_Ant1_Low_2402



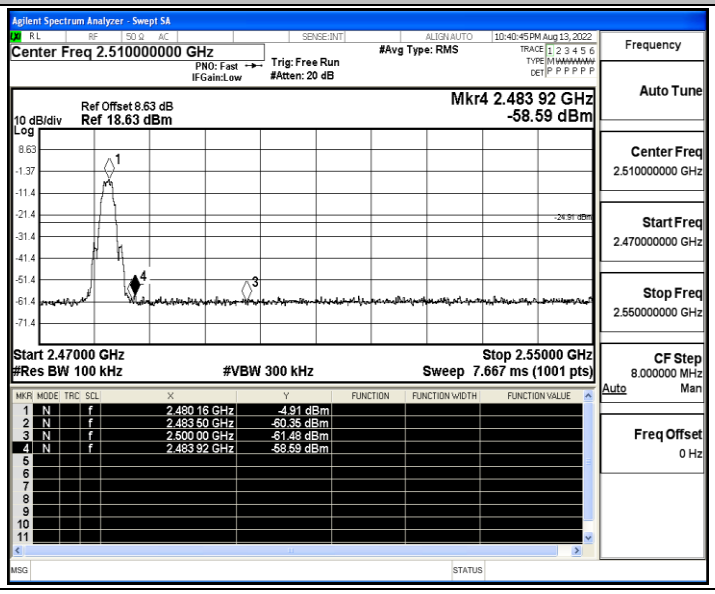

BLE_1M_Ant1_High_2480




BLE_2M_Ant1_Low_2402




BLE_2M_Ant1_High_2480



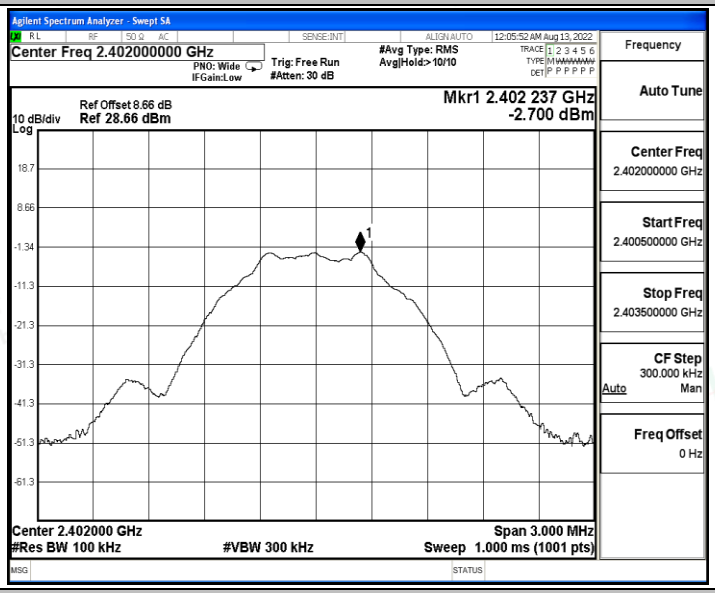
# A.6 Conducted Spurious Emission

## Test Result

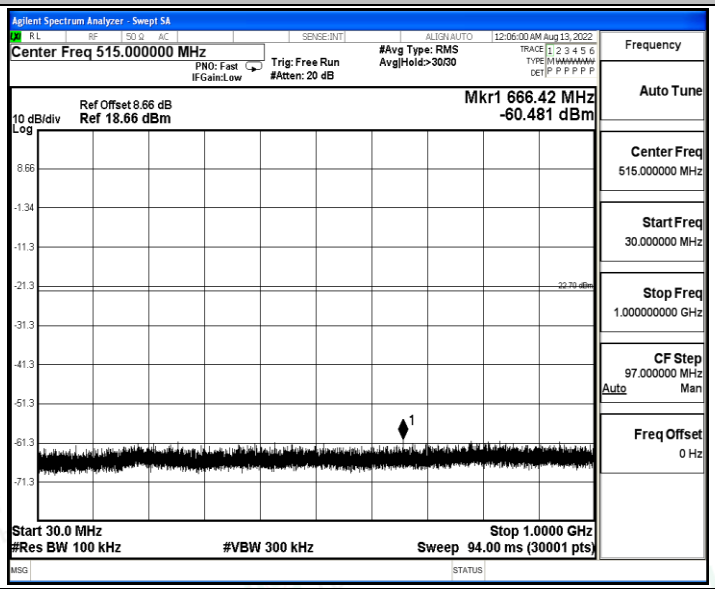
| TestMode | Antenna | Channel | FreqRange [MHz] | RefLevel [dBm] | Result[dBm] | Limit[dBm] | Verdict |
|---|---|---|---|---|---|---|---|
| BLE_1M | Ant1 | 2402 | Reference | -2.70 | -2.70 | --- | PASS |
| | | | 30~1000 | -2.70 | -60.48 | ≤-22.7 | PASS |
| | | | 1000~26500 | -2.70 | -45.72 | ≤-22.7 | PASS |
| | | 2440 | Reference | -2.78 | -2.78 | --- | PASS |
| | | | 30~1000 | -2.78 | -60.33 | ≤-22.78 | PASS |
| | | | 1000~26500 | -2.78 | -46.07 | ≤-22.78 | PASS |
| | | 2480 | Reference | -2.74 | -2.74 | --- | PASS |
| | | | 30~1000 | -2.74 | -60.46 | ≤-22.74 | PASS |
| | | | 1000~26500 | -2.74 | -45.74 | ≤-22.74 | PASS |
| BLE_2M | Ant1 | 2402 | Reference | -6.04 | -6.04 | --- | PASS |
| | | | 30~1000 | -6.04 | -60.65 | ≤-26.04 | PASS |
| | | | 1000~26500 | -6.04 | -46.21 | ≤-26.04 | PASS |
| | | 2440 | Reference | -6.04 | -6.04 | --- | PASS |
| | | | 30~1000 | -6.04 | -60.87 | ≤-26.04 | PASS |
| | | | 1000~26500 | -6.04 | -46.15 | ≤-26.04 | PASS |
| | | 2480 | Reference | -5.61 | -5.61 | --- | PASS |
| | | | 30~1000 | -5.61 | -60.97 | ≤-25.61 | PASS |
| | | | 1000~26500 | -5.61 | -45.81 | ≤-25.61 | PASS |

## Test Graphs

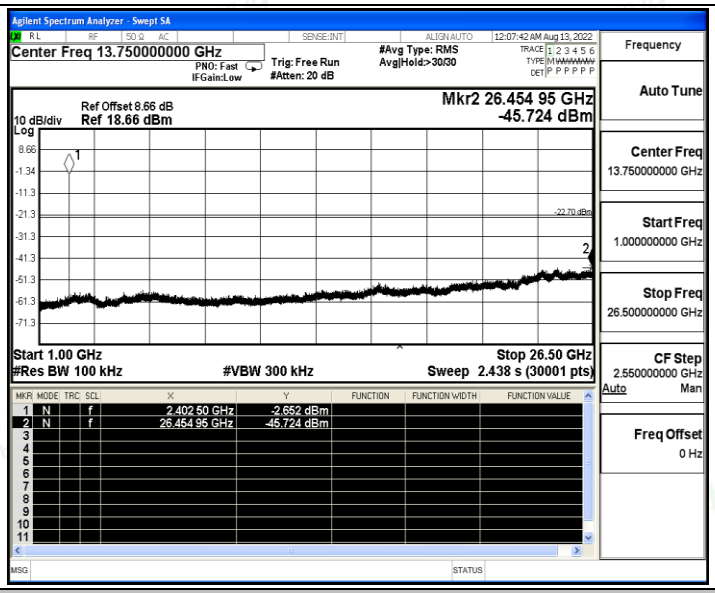
BLE_1M_Ant1_2402_0~Reference



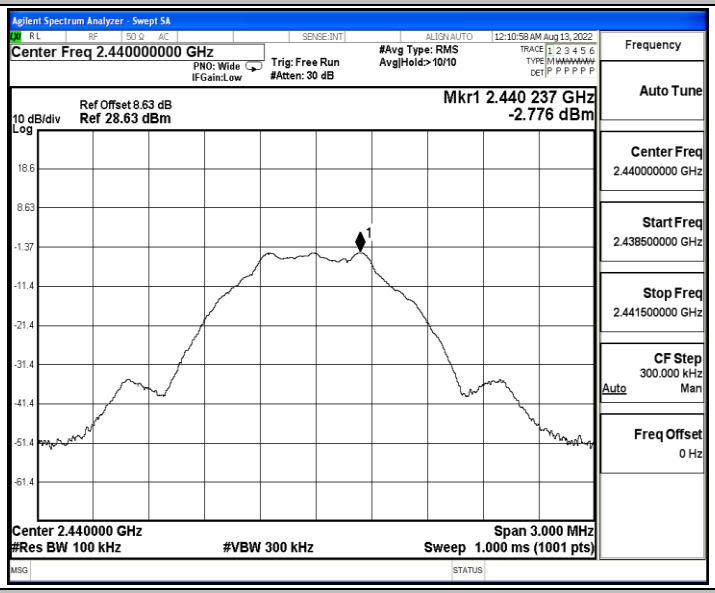

BLE_1M_Ant1_2402_30~1000



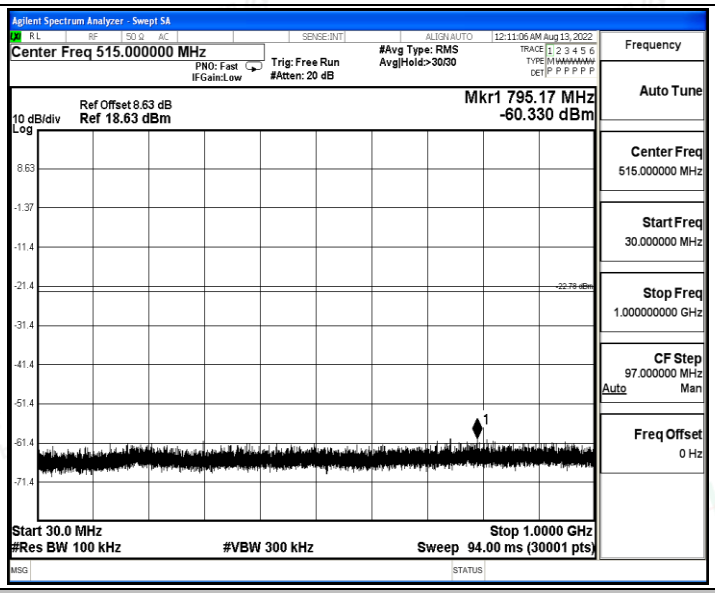

BLE_1M_Ant1_2402_1000~26500



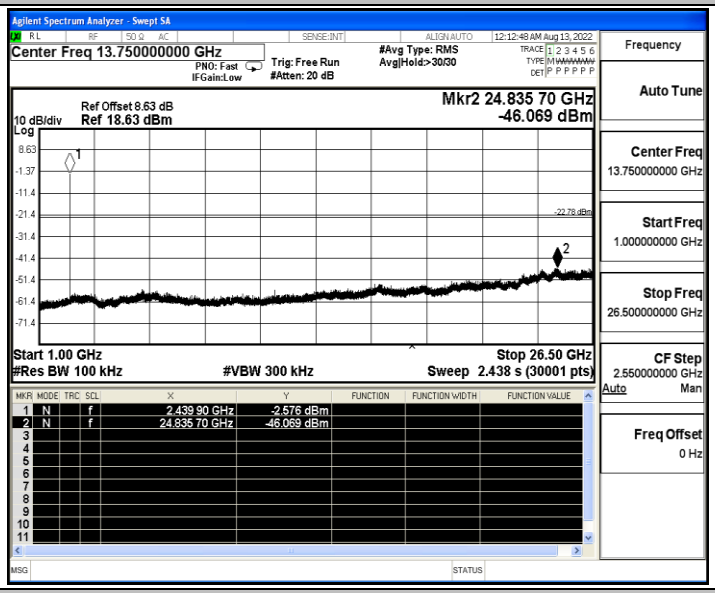

BLE_1M_Ant1_2440_0~Reference



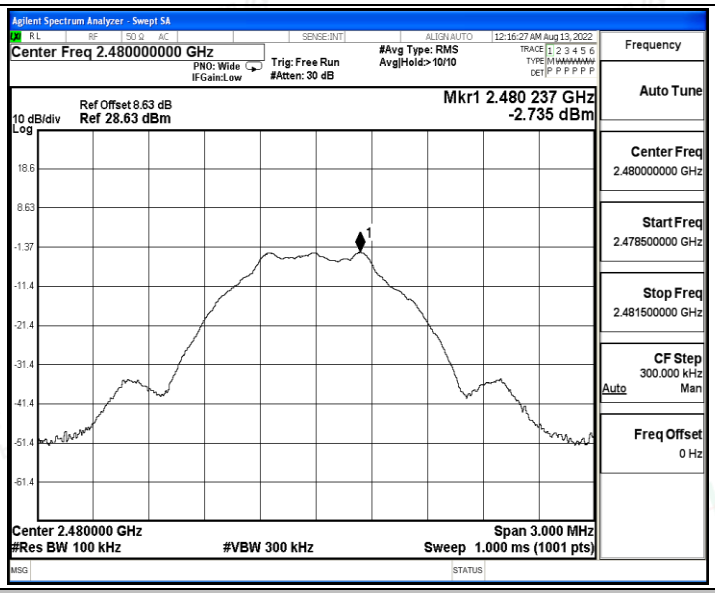

BLE_1M_Ant1_2440_30~1000



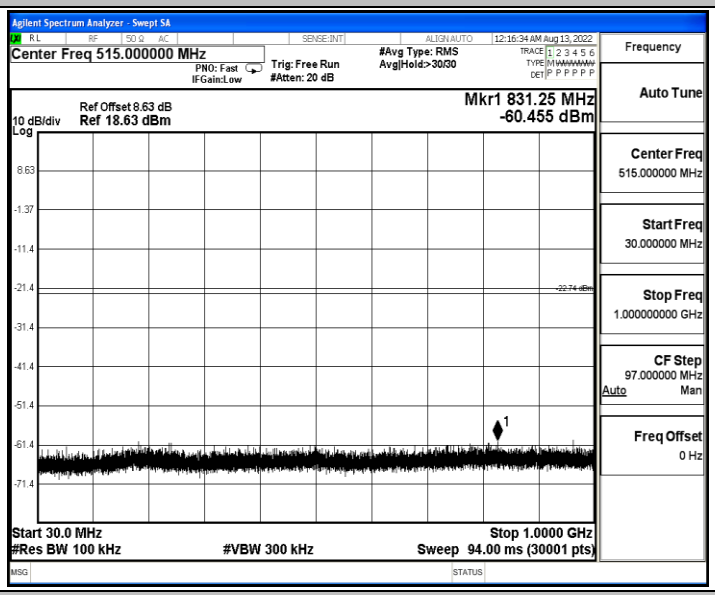

BLE_1M_Ant1_2440_1000~26500



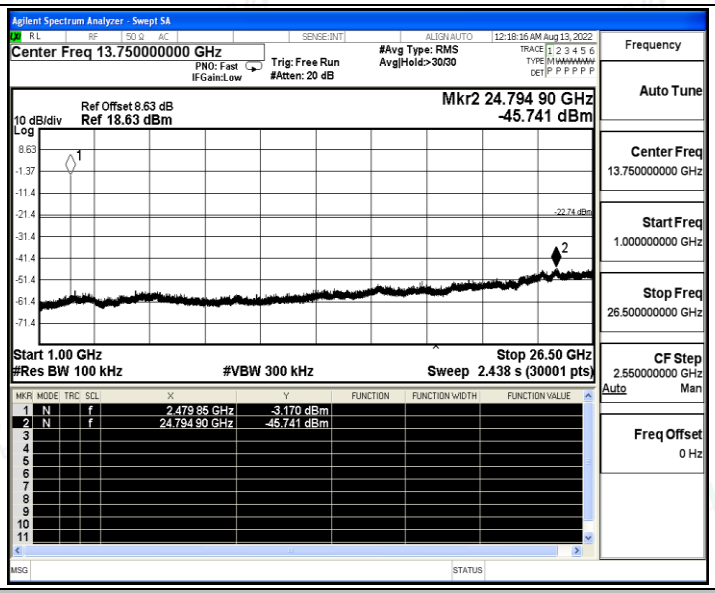

BLE_1M_Ant1_2480_0~Reference



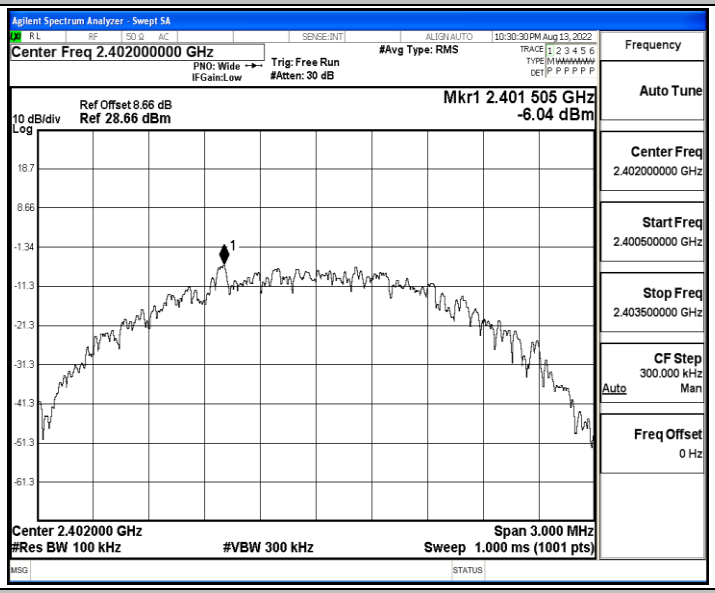

BLE_1M_Ant1_2480_30~1000



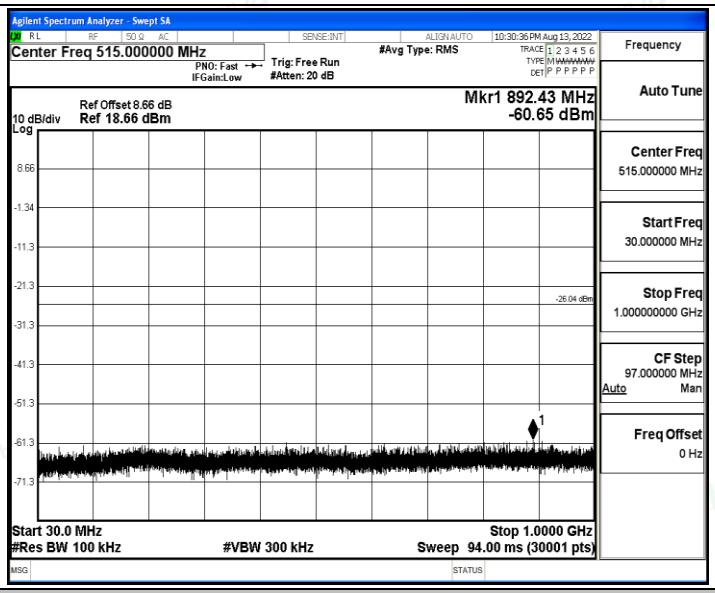

BLE_1M_Ant1_2480_1000~26500



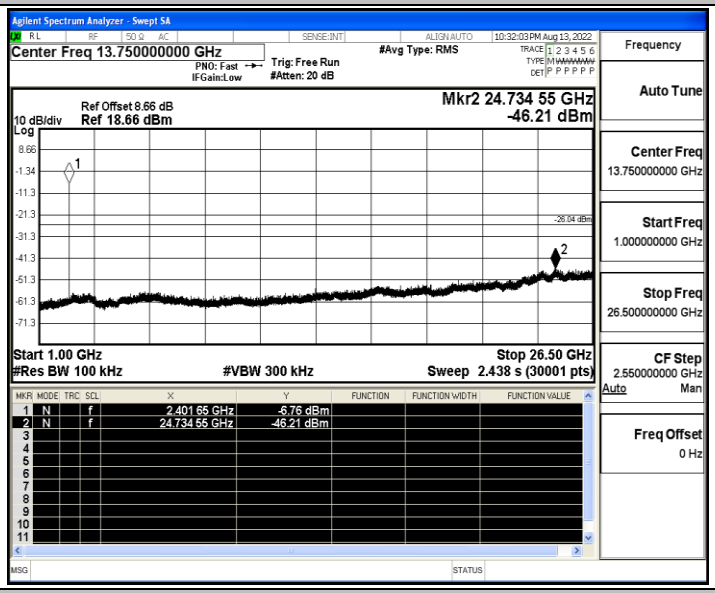

BLE_2M_Ant1_2402_0~Reference



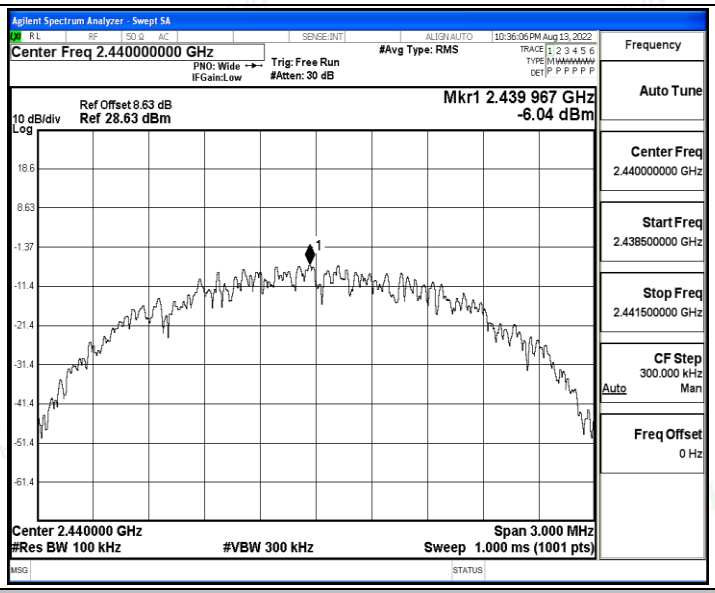

BLE_2M_Ant1_2402_30~1000



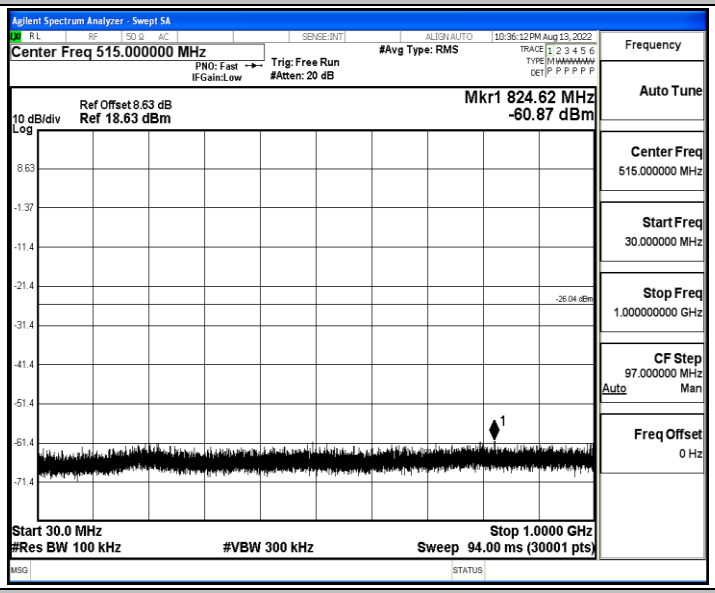

BLE_2M_Ant1_2402_1000~26500



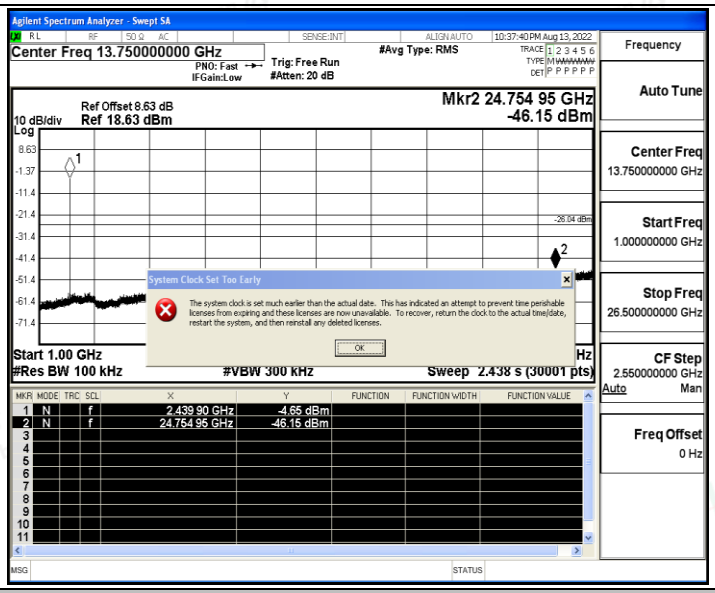

BLE_2M_Ant1_2440_0~Reference



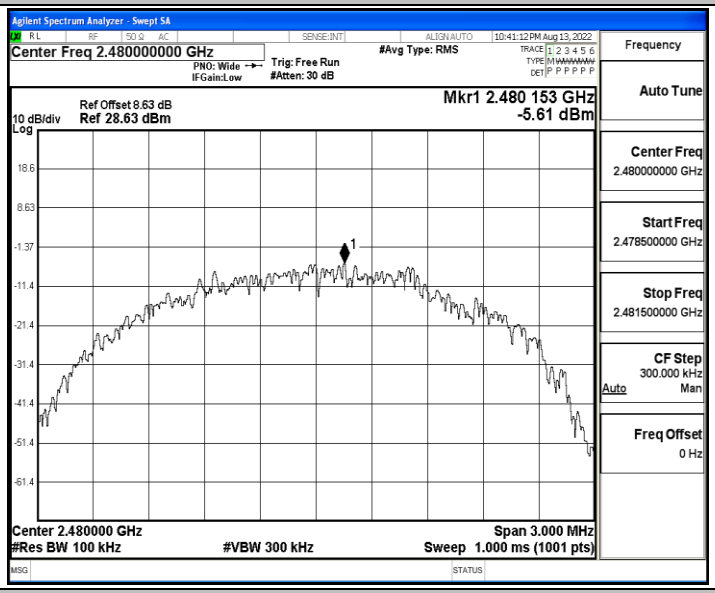

BLE_2M_Ant1_2440_30~1000



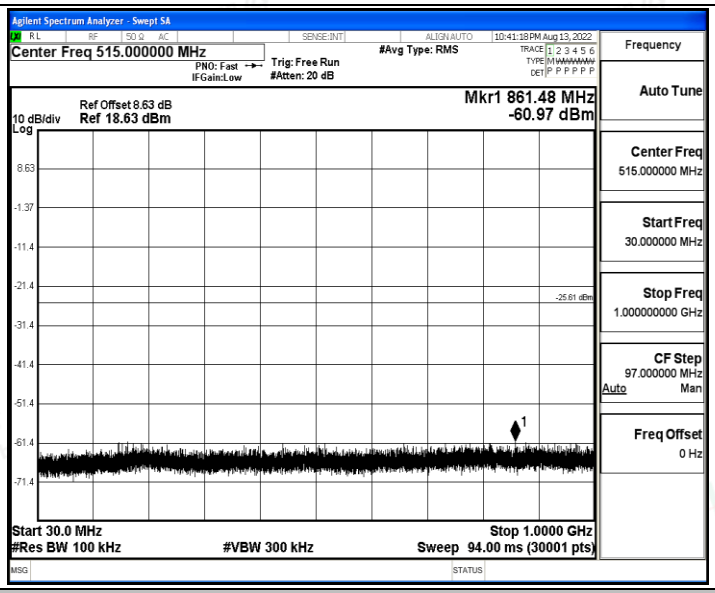

BLE_2M_Ant1_2440_1000~26500



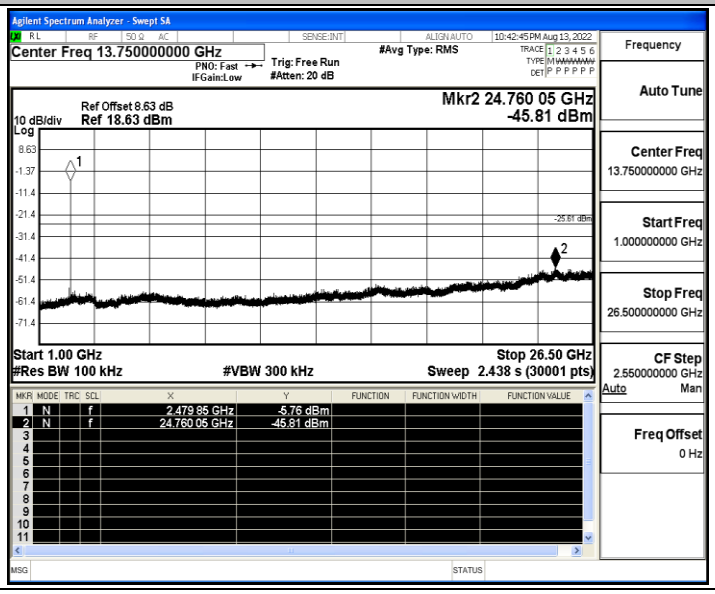

BLE_2M_Ant1_2480_0~Reference




BLE_2M_Ant1_2480_30~1000




BLE_2M_Ant1_2480_1000~26500



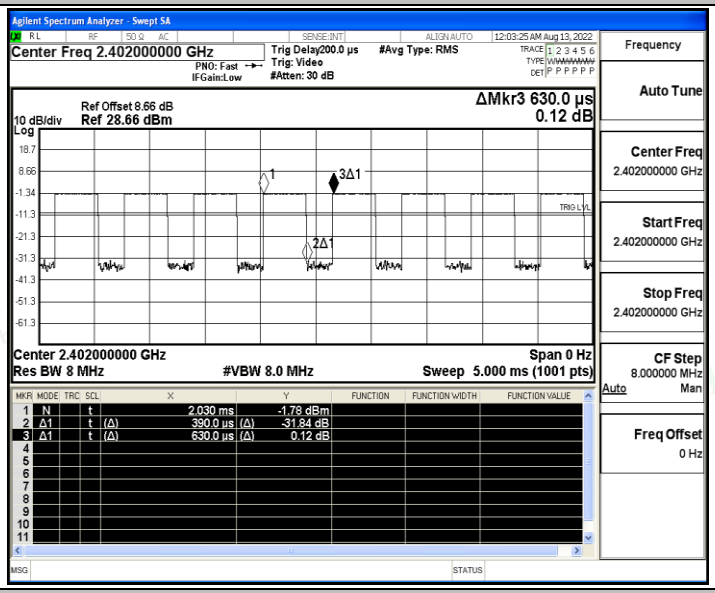
# A.7 Duty Cycle

## Test Result

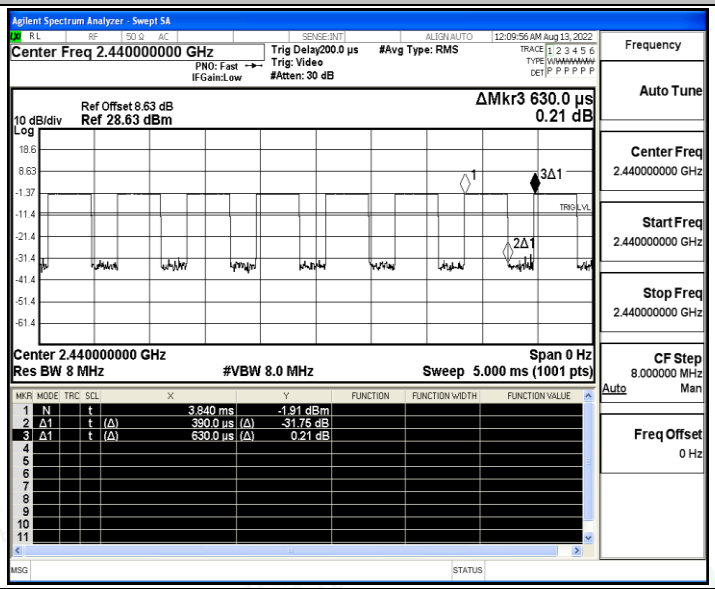
| TestMode | Antenna | Channel | ON Time [ms] | Period [ms] | X | DC [%] | xFactor | 1/T | Limit | Verdict |
|---|---|---|---|---|---|---|---|---|---|---|
| BLE_1M | Ant1 | 2402 | 0.39 | 0.63 | 0.6190 | 61.90 | 2.08 | 2.56 | --- | --- |
| | | 2440 | 0.39 | 0.63 | 0.6190 | 61.90 | 2.08 | 2.56 | --- | --- |
| | | 2480 | 0.39 | 0.63 | 0.6190 | 61.90 | 2.08 | 2.56 | --- | --- |
| BLE_2M | Ant1 | 2402 | 1.07 | 1.87 | 0.5722 | 57.22 | 2.42 | 0.93 | --- | --- |
| | | 2440 | 1.07 | 1.87 | 0.5722 | 57.22 | 2.42 | 0.93 | --- | --- |
| | | 2480 | 1.07 | 1.88 | 0.5691 | 56.91 | 2.45 | 0.93 | --- | --- |

## Test Graphs

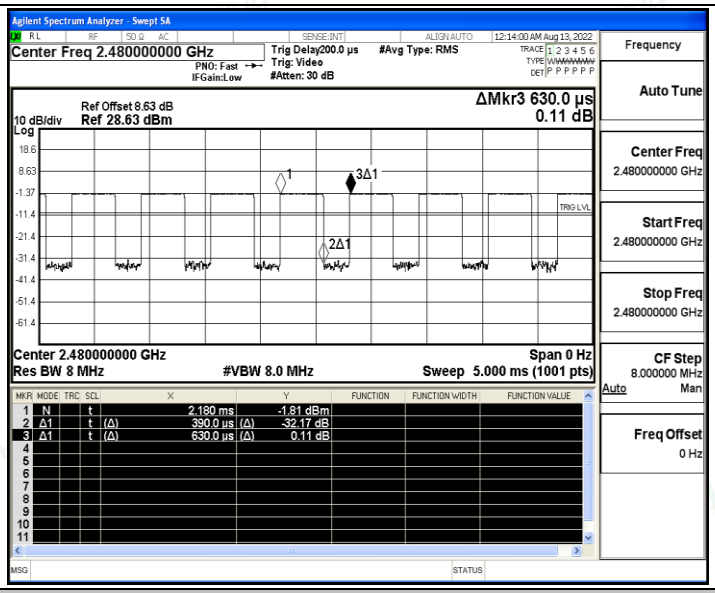
BLE_1M_Ant1_2402



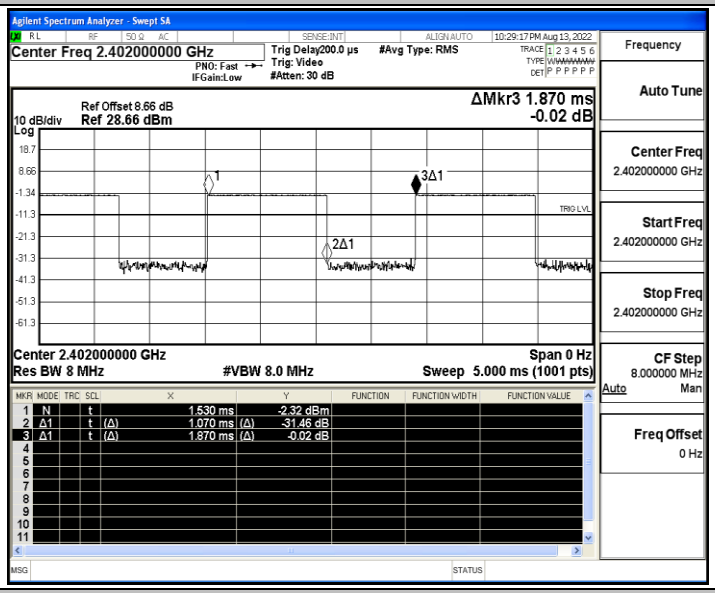

BLE_1M_Ant1_2440



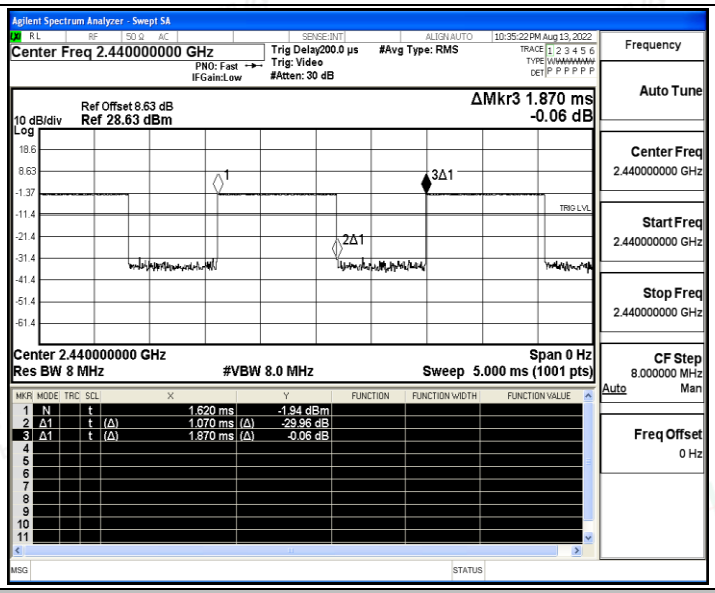

BLE_1M_Ant1_2480



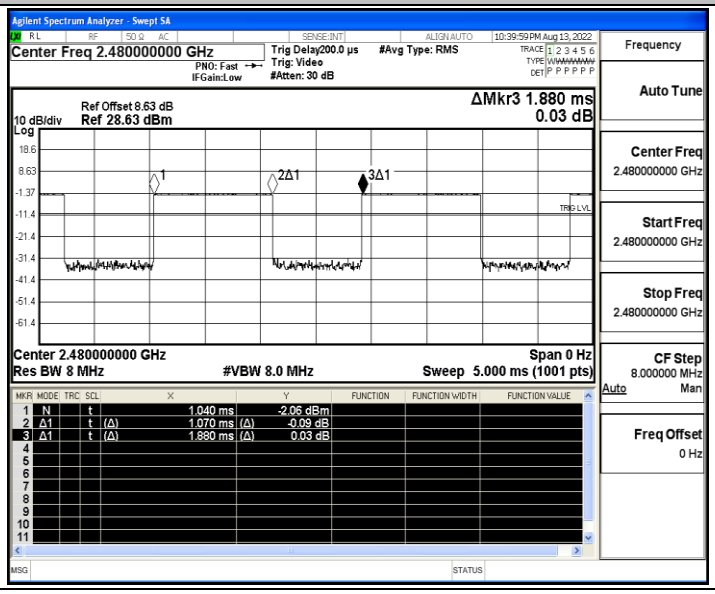

BLE_2M_Ant1_2402




BLE_2M_Ant1_2440




BLE_2M_Ant1_2480



# A.8 Emissions in Restricted Bands

## Test Result

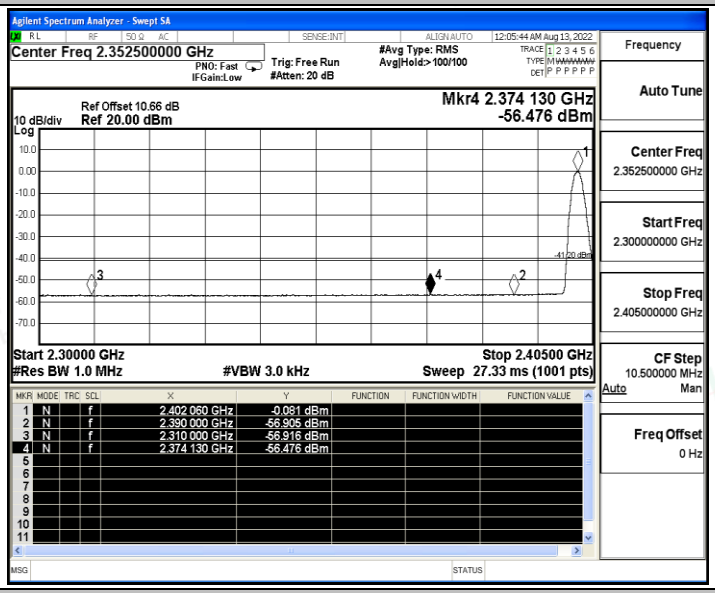
| TestMode | Antenna | ChName | Channel | Detector | Freq. [MHz] | Result [dBm] | Limit [dBm] | Result [dBuV/m] | Limit [dBuV/m] | Verdict |
|---|---|---|---|---|---|---|---|---|---|---|
| BLE_1M | Ant1 | Low | 2402 | AV | 2310.000 | -56.92 | ≤-41.20 | 38.28 | ≤54 | PASS |
| | | | | AV | 2374.130 | -56.48 | ≤-41.20 | 38.72 | ≤54 | PASS |
| | | | | AV | 2390.000 | -56.91 | ≤-41.20 | 38.29 | ≤54 | PASS |
| | | | | Peak | 2310.000 | -46.25 | ≤-21.20 | 48.95 | ≤74 | PASS |
| | | | | Peak | 2310.080 | -46.79 | ≤-21.20 | 48.41 | ≤74 | PASS |
| | | | | Peak | 2390.000 | -48.12 | ≤-21.20 | 47.08 | ≤74 | PASS |
| | | High | 2480 | AV | 2483.500 | -54.17 | ≤-41.20 | 41.03 | ≤54 | PASS |
| | | | | AV | 2483.520 | -54.17 | ≤-41.20 | 41.03 | ≤54 | PASS |
| | | | | AV | 2500.000 | -56.35 | ≤-41.20 | 38.85 | ≤54 | PASS |
| | | | | Peak | 2483.500 | -47.83 | ≤-21.20 | 47.37 | ≤74 | PASS |
| | | | | Peak | 2493.920 | -46.1 | ≤-21.20 | 49.10 | ≤74 | PASS |
| | | | | Peak | 2500.000 | -47.84 | ≤-21.20 | 47.36 | ≤74 | PASS |
| BLE_2M | Ant1 | Low | 2402 | AV | 2310.000 | -57.56 | ≤-41.20 | 37.64 | ≤54 | PASS |
| | | | | AV | 2386.520 | -57.21 | ≤-41.20 | 37.99 | ≤54 | PASS |
| | | | | AV | 2390.000 | -57.39 | ≤-41.20 | 37.81 | ≤54 | PASS |
| | | | | Peak | 2310.000 | -51.05 | ≤-21.20 | 44.15 | ≤74 | PASS |
| | | | | Peak | 2320.685 | -46.76 | ≤-21.20 | 48.44 | ≤74 | PASS |
| | | | | Peak | 2390.000 | -49.87 | ≤-21.20 | 45.33 | ≤74 | PASS |
| | | High | 2480 | AV | 2483.500 | -51.45 | ≤-41.20 | 43.75 | ≤54 | PASS |
| | | | | AV | 2483.520 | -51.45 | ≤-41.20 | 43.75 | ≤54 | PASS |
| | | | | AV | 2500.000 | -56.73 | ≤-41.20 | 38.47 | ≤54 | PASS |
| | | | | Peak | 2483.500 | -49.02 | ≤-21.20 | 46.18 | ≤74 | PASS |
| | | | | Peak | 2483.760 | -46.79 | ≤-21.20 | 48.41 | ≤74 | PASS |
| | | | | Peak | 2500.000 | -50.23 | ≤-21.20 | 44.97 | ≤74 | PASS |

Note:

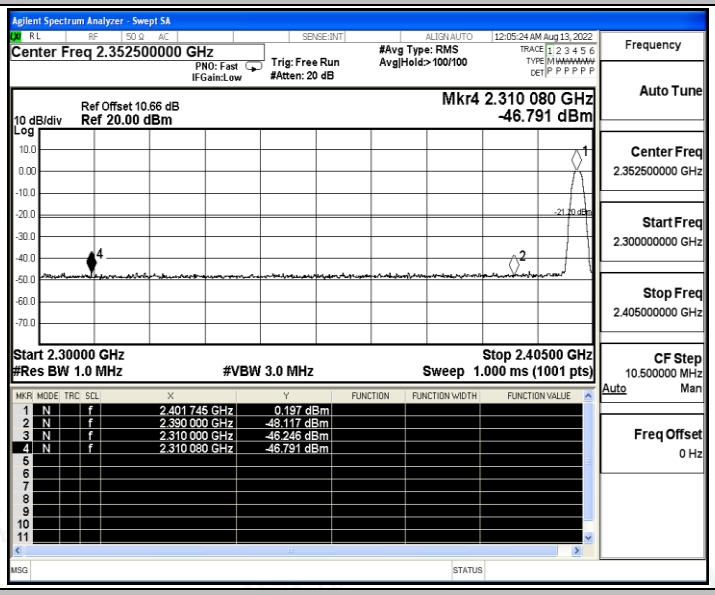
1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

## Test Graphs

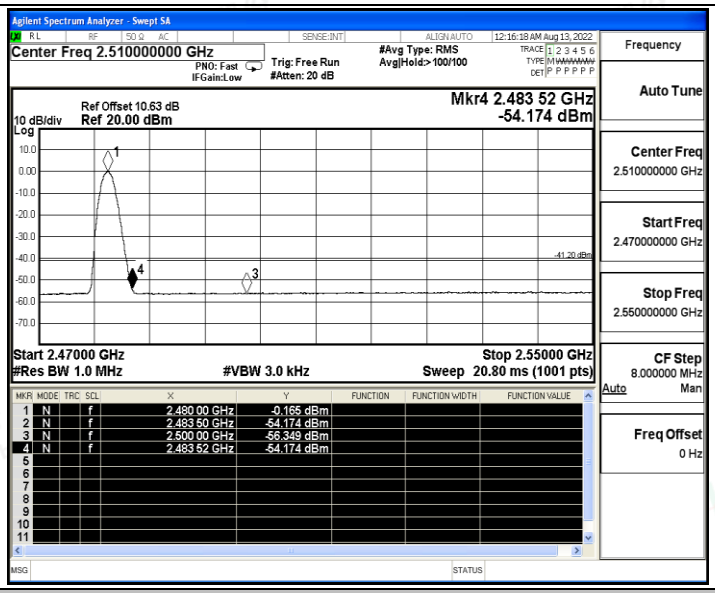
BLE_1M_Ant1_Low_2402_AV



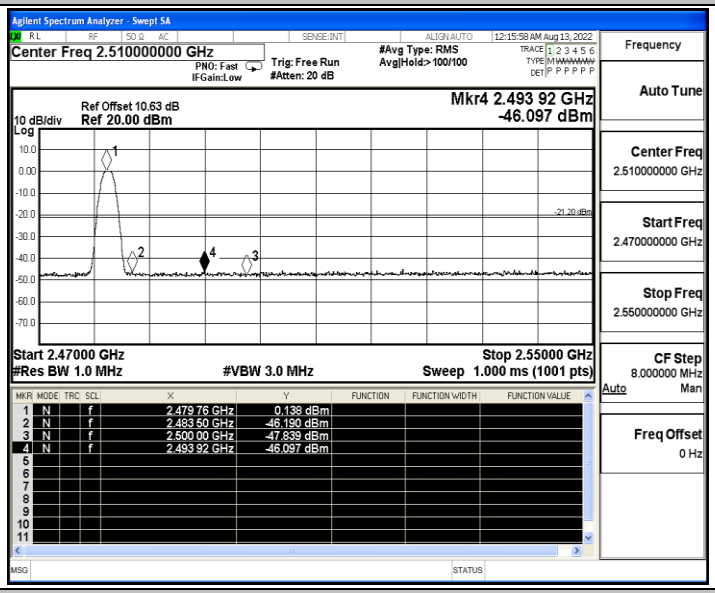

BLE_1M_Ant1_Low_2402_Peak



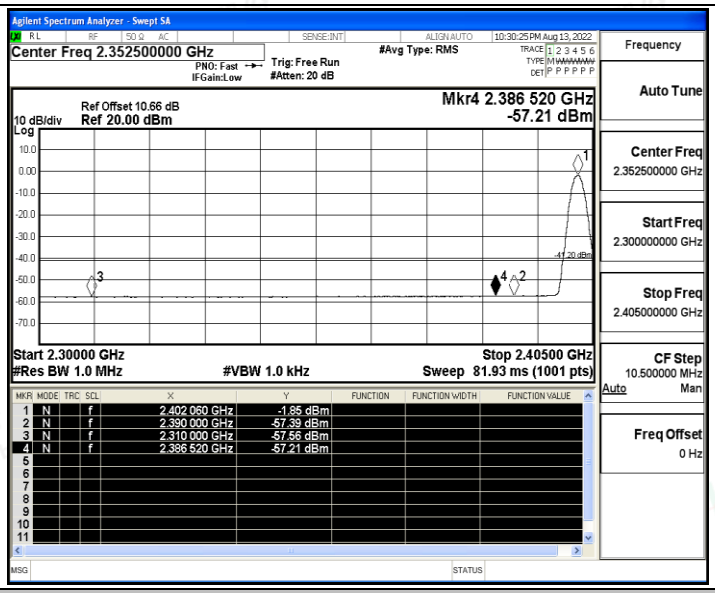

BLE_1M_Ant1_High_2480_AV



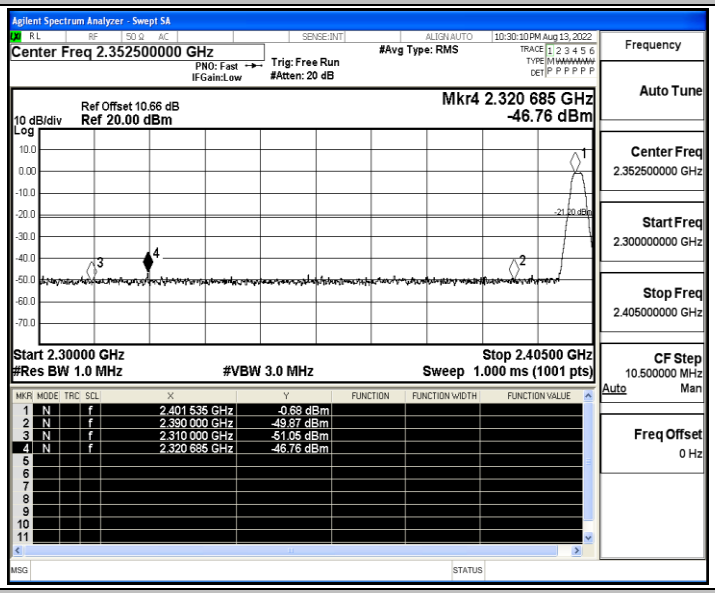

BLE_1M_Ant1_High_2480_Peak



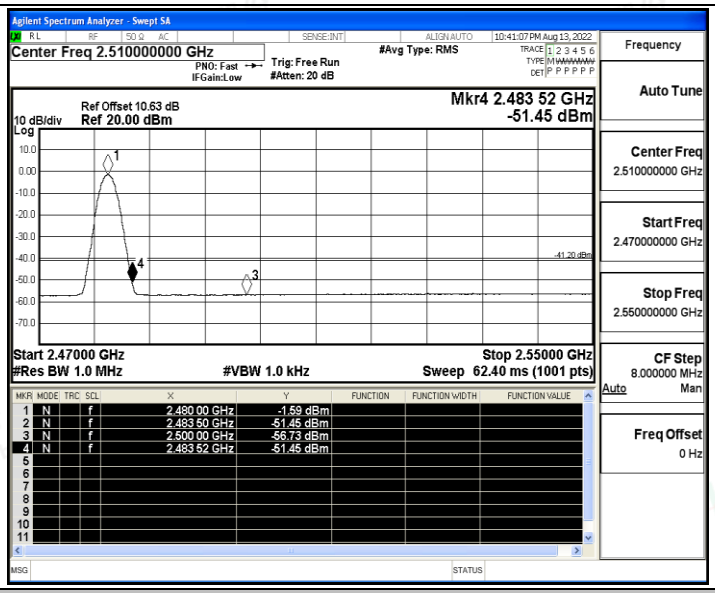

BLE_2M_Ant1_Low_2402_AV

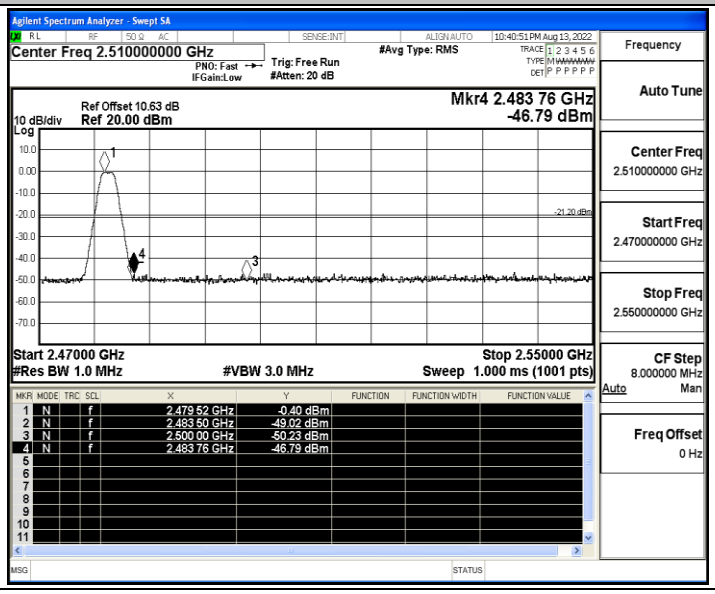



BLE_2M_Ant1_Low_2402_Peak




BLE_2M_Ant1_High_2480_AV




BLE_2M_Ant1_High_2480_Peak