

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

Product Name: ICLED controller

Trade Mark: RECOIL

Test Model: ICLED-4C

FCC ID: 2A6RGICLED-4C

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 |

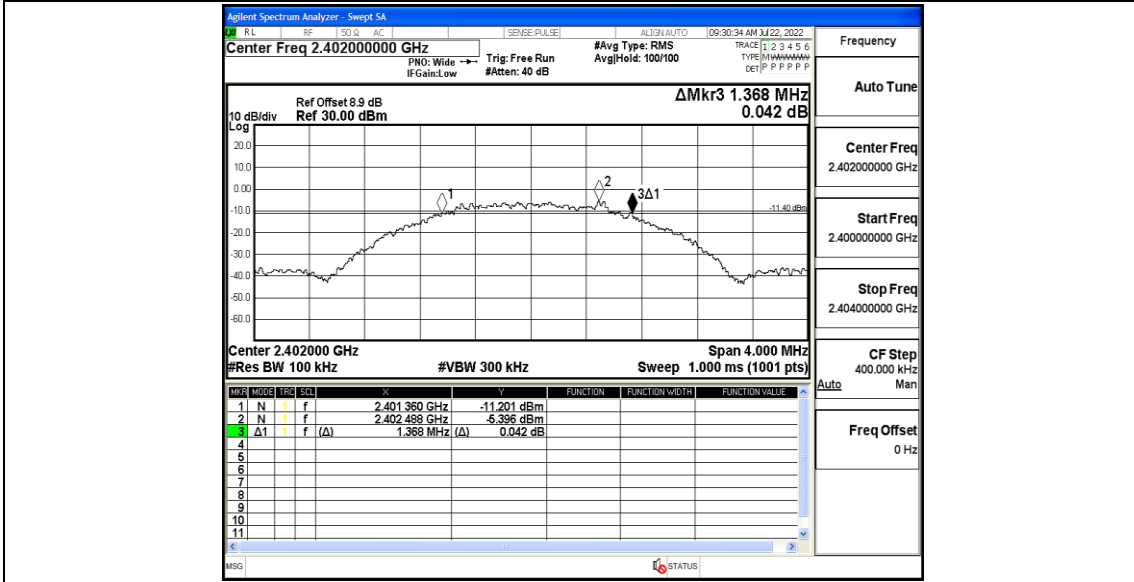
Appendix A: DTS Bandwidth

Test Result

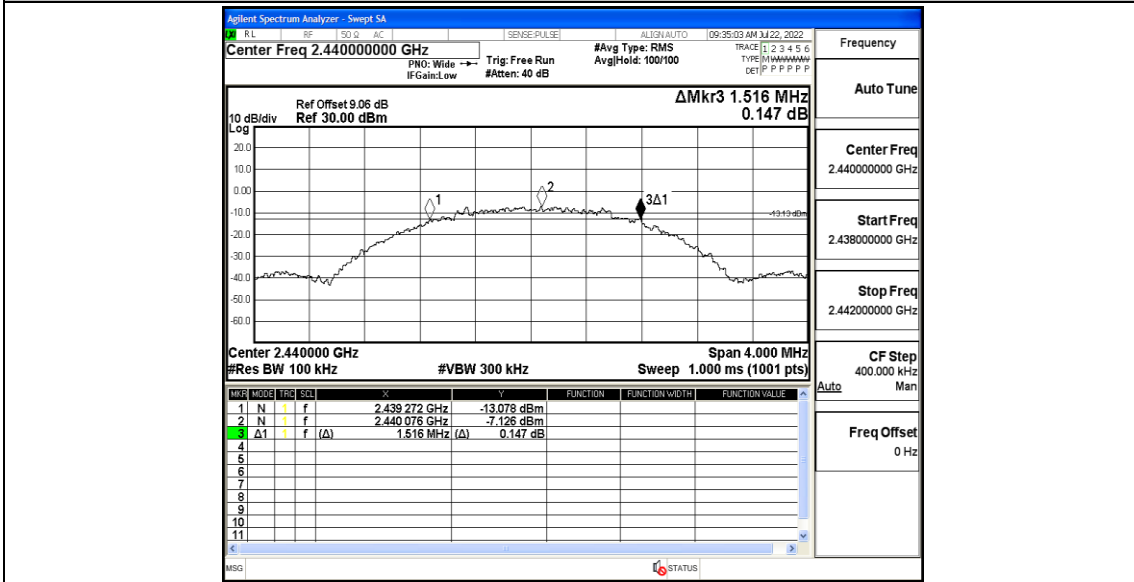
| TestMode | Antenna | Channel | DTS BW [MHz] | FL[MHz] | FH[MHz] | Limit[MHz] | Verdict |
|----------|---------|---------|--------------|----------|----------|------------|---------|
| BLE_1M | Ant1 | 2402 | 0.696 | 2401.664 | 2402.360 | 0.5 | PASS |
| | | 2440 | 0.660 | 2439.688 | 2440.348 | 0.5 | PASS |
| | | 2480 | 0.672 | 2479.676 | 2480.348 | 0.5 | PASS |
| BLE_2M | Ant1 | 2402 | 1.368 | 2401.360 | 2402.728 | 0.5 | PASS |
| | | 2440 | 1.516 | 2439.272 | 2440.788 | 0.5 | PASS |
| | | 2480 | 1.224 | 2479.408 | 2480.632 | 0.5 | PASS |

Test Graphs

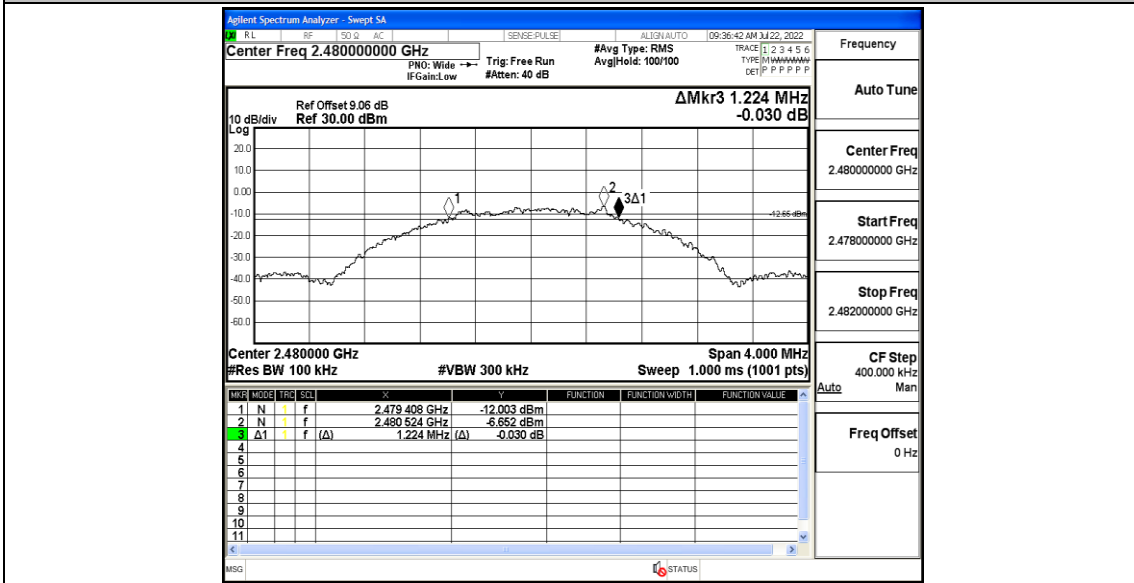




BLE_2M_Ant1_2440



BLE_2M_Ant1_2480

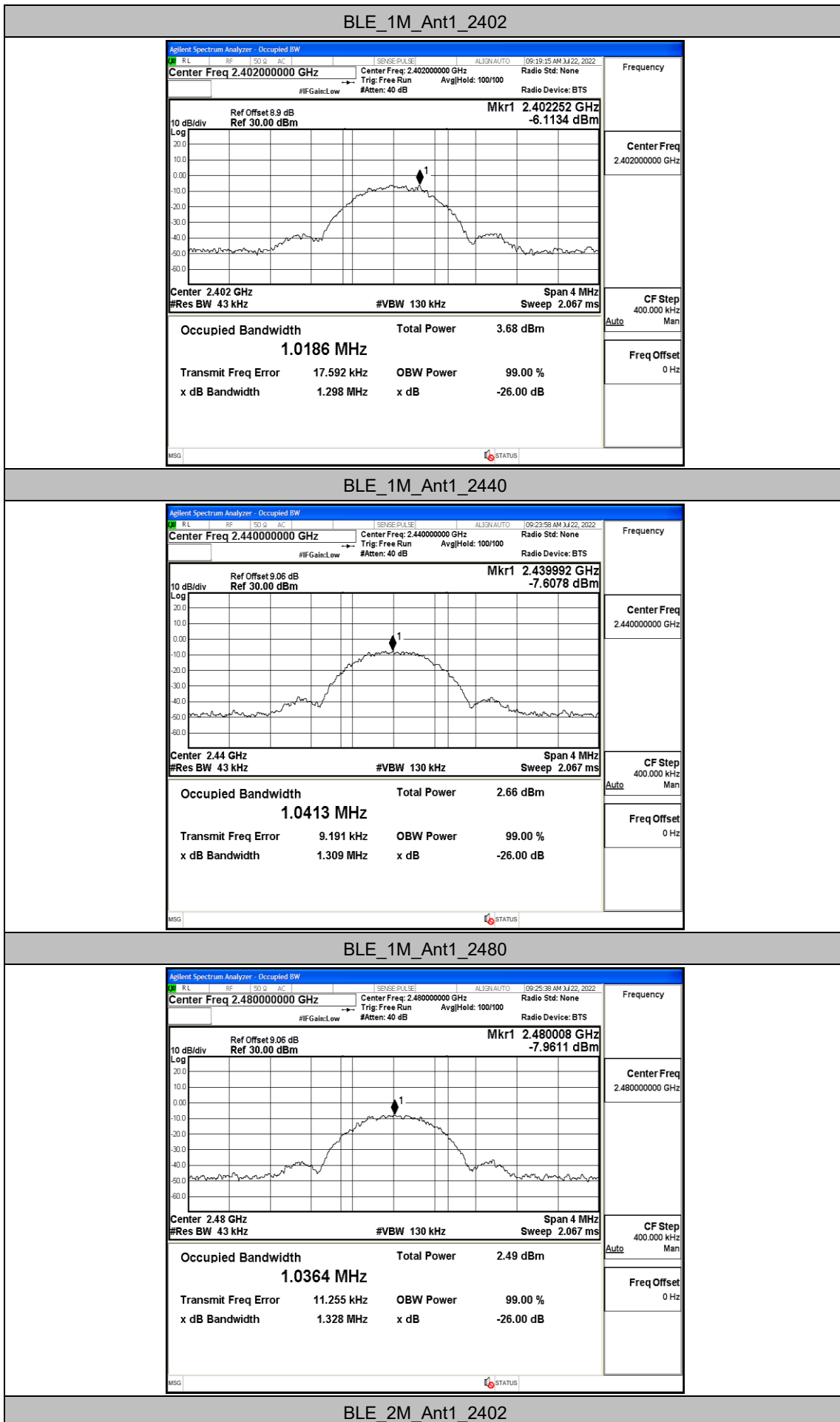


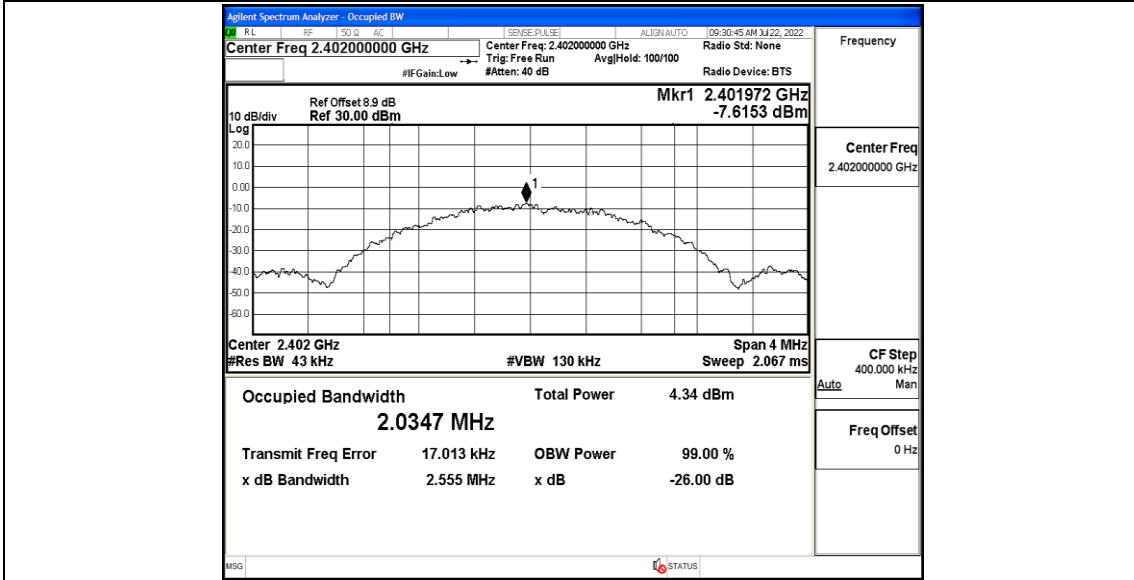
Appendix B: Occupied Channel Bandwidth

Test Result

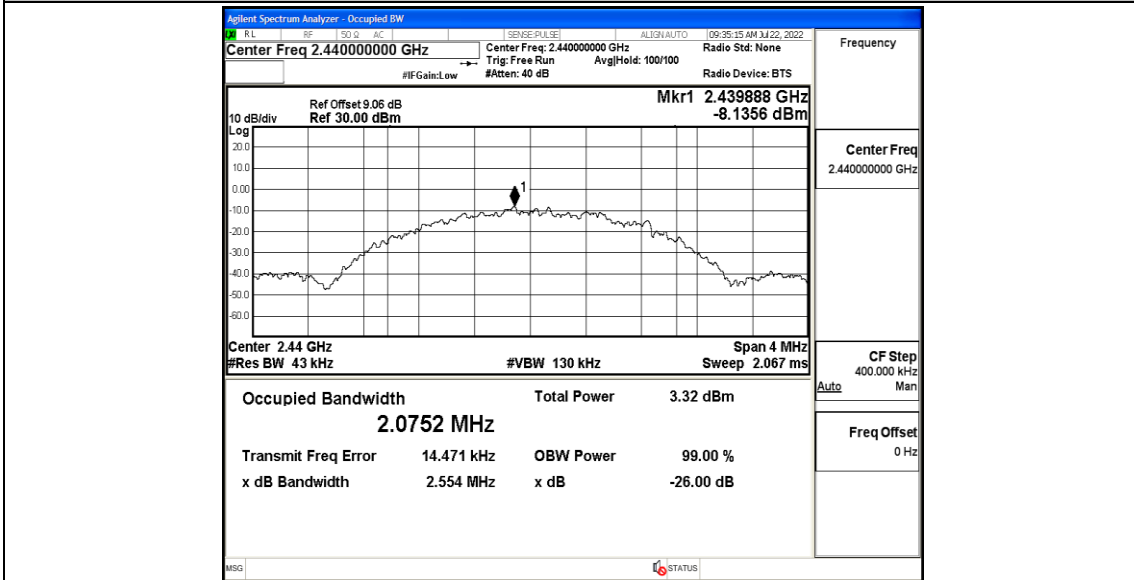
| TestMode | Antenna | Channel | OCB [MHz] | FL[MHz] | FH[MHz] | Limit[MHz] | Verdict |
|----------|---------|---------|-----------|----------|----------|------------|---------|
| BLE_1M | Ant1 | 2402 | 1.0186 | 2401.508 | 2402.527 | --- | --- |
| | | 2440 | 1.0413 | 2439.489 | 2440.530 | --- | --- |
| | | 2480 | 1.0364 | 2479.493 | 2480.529 | --- | --- |
| BLE_2M | Ant1 | 2402 | 2.0347 | 2401.000 | 2403.034 | --- | --- |
| | | 2440 | 2.0752 | 2438.977 | 2441.052 | --- | --- |
| | | 2480 | 2.0674 | 2478.980 | 2481.048 | --- | --- |

Test Graphs

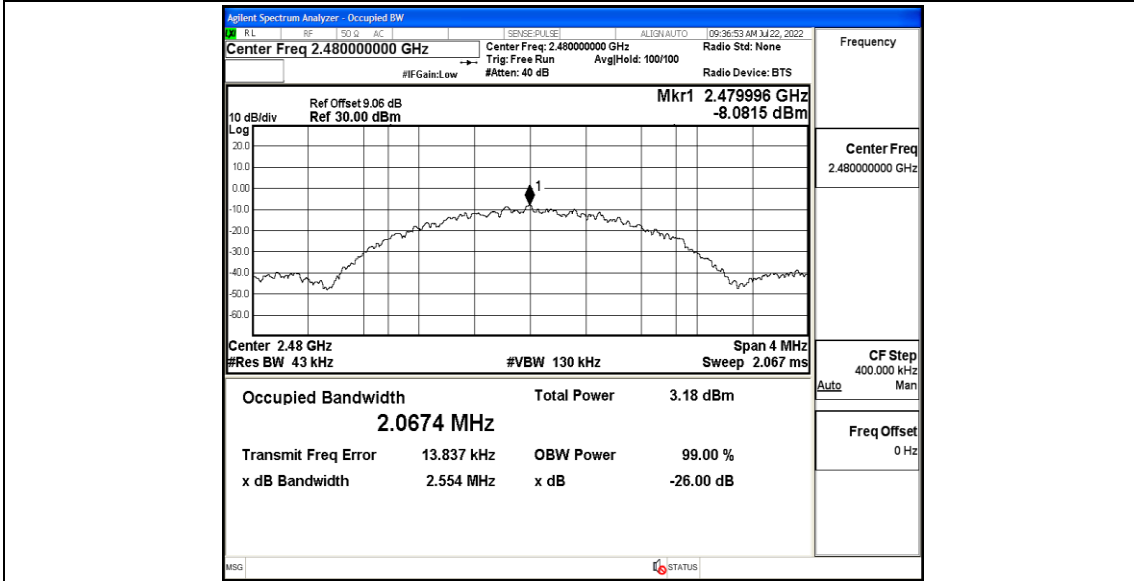




BLE_2M_Ant1_2440



BLE_2M_Ant1_2480

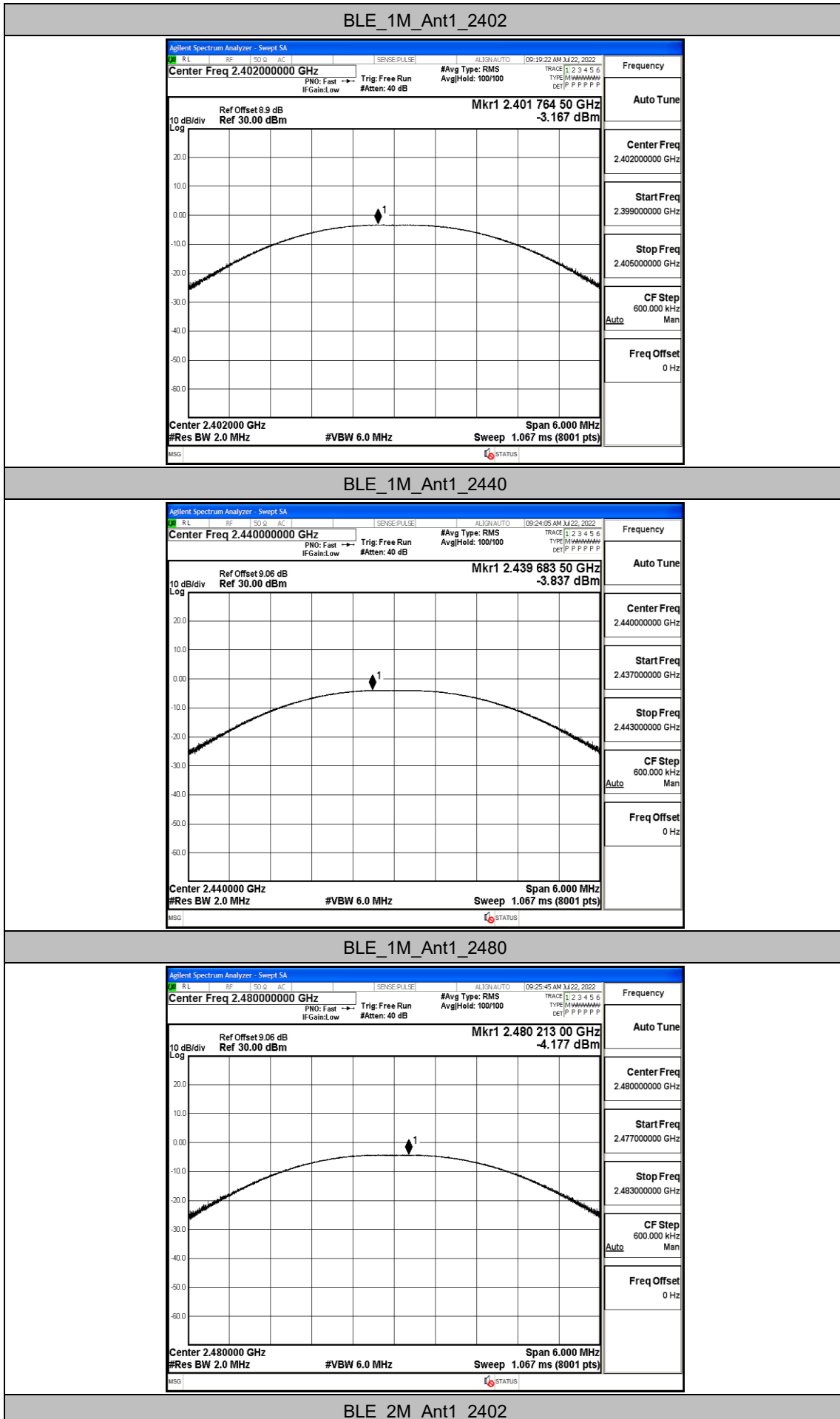


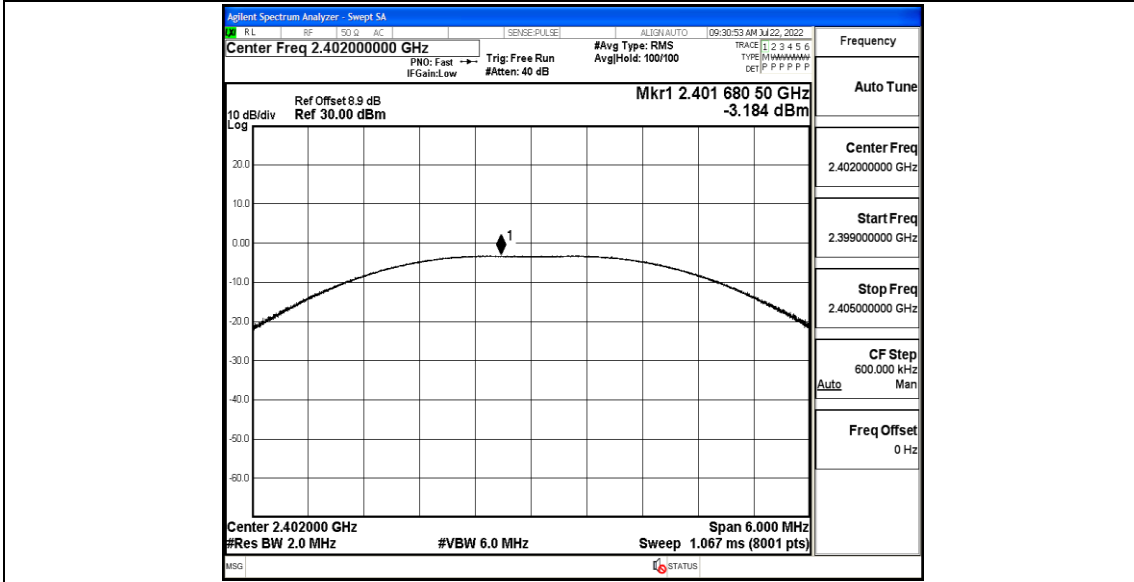
Appendix C: Maximum Peak conducted output power

Test Result

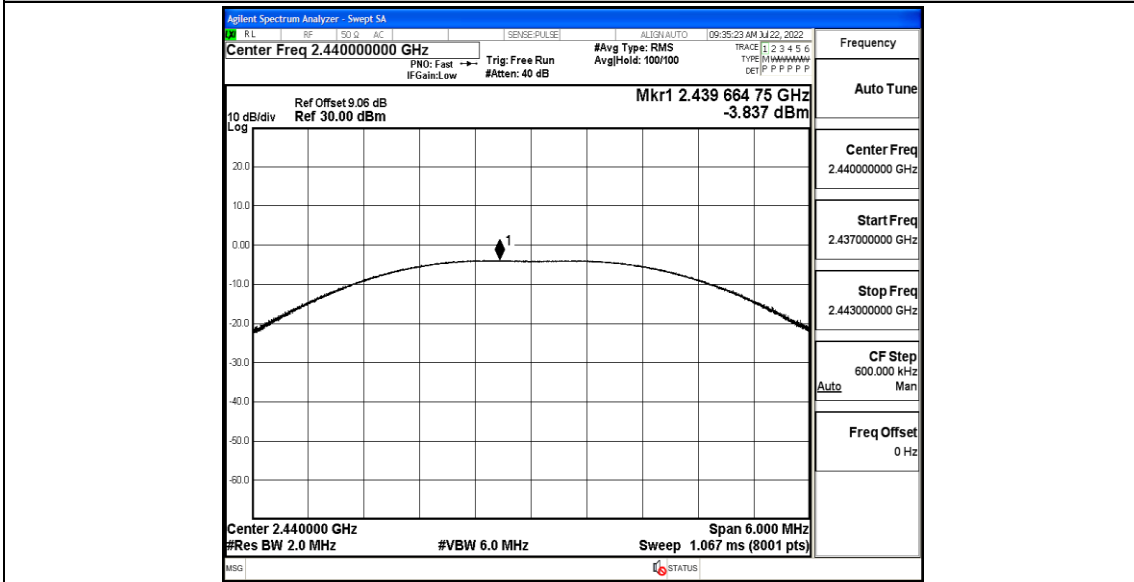
| TestMode | Antenna | Channel | Result[dBm] | Limit[dBm] | Verdict |
|----------|---------|---------|-------------|------------|---------|
| BLE_1M | Ant1 | 2402 | -3.17 | ≤30 | PASS |
| | | 2440 | -3.84 | ≤30 | PASS |
| | | 2480 | -4.18 | ≤30 | PASS |
| BLE_2M | Ant1 | 2402 | -3.18 | ≤30 | PASS |
| | | 2440 | -3.84 | ≤30 | PASS |
| | | 2480 | -4.24 | ≤30 | PASS |

Test Graphs

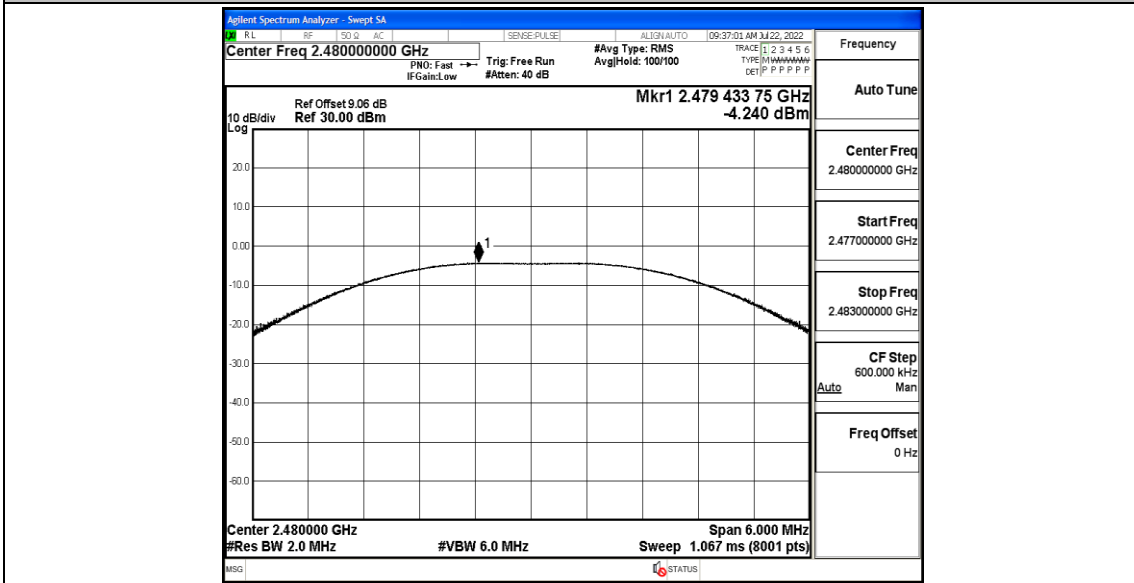




BLE_2M_Ant1_2440



BLE_2M_Ant1_2480



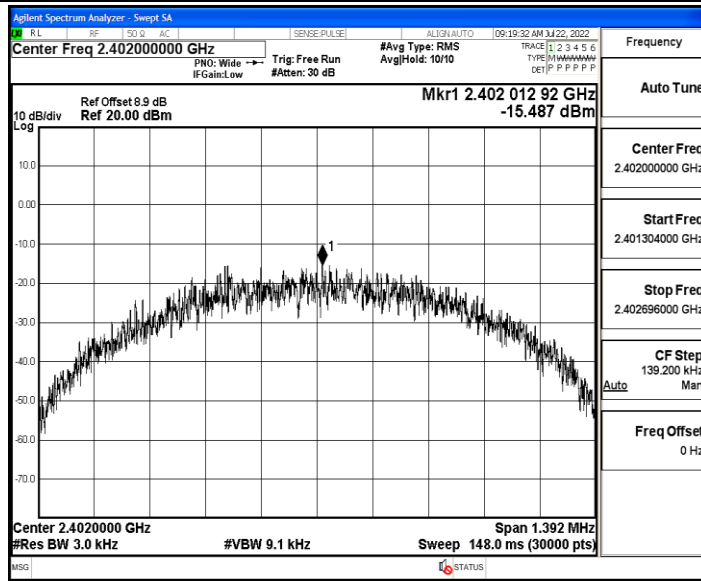
Appendix D: Maximum power spectral density

Test Result

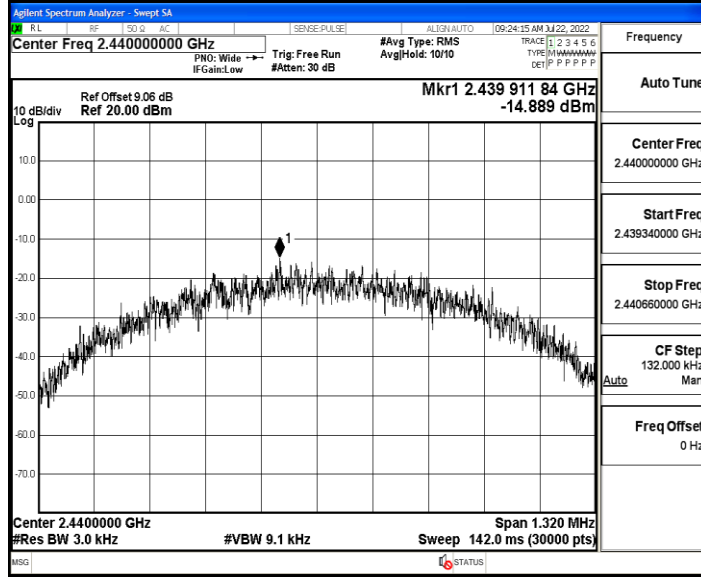
| TestMode | Antenna | Channel | Result[dBm/3-100kHz] | Limit[dBm/3kHz] | Verdict |
|----------|---------|---------|----------------------|-----------------|---------|
| BLE_1M | Ant1 | 2402 | -15.49 | ≤8.00 | PASS |
| | | 2440 | -14.89 | ≤8.00 | PASS |
| | | 2480 | -14.98 | ≤8.00 | PASS |
| BLE_2M | Ant1 | 2402 | -15.42 | ≤8.00 | PASS |
| | | 2440 | -17.91 | ≤8.00 | PASS |
| | | 2480 | -16.83 | ≤8.00 | PASS |

Test Graphs

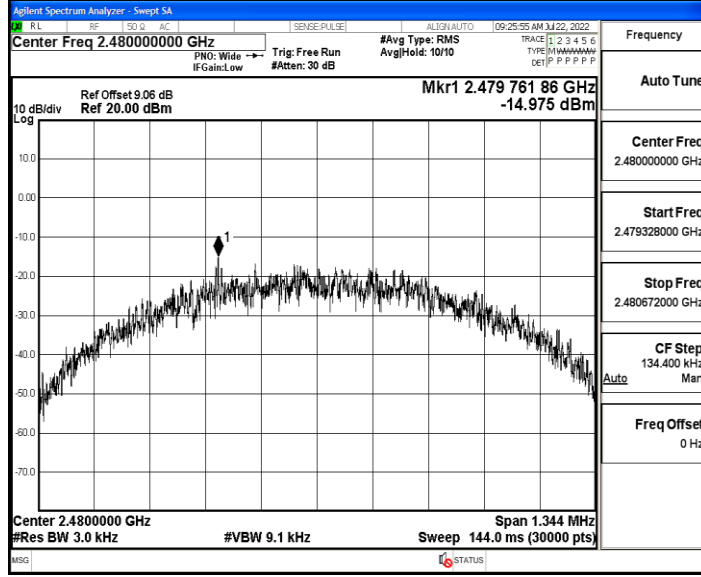
BLE_1M_Ant1_2402



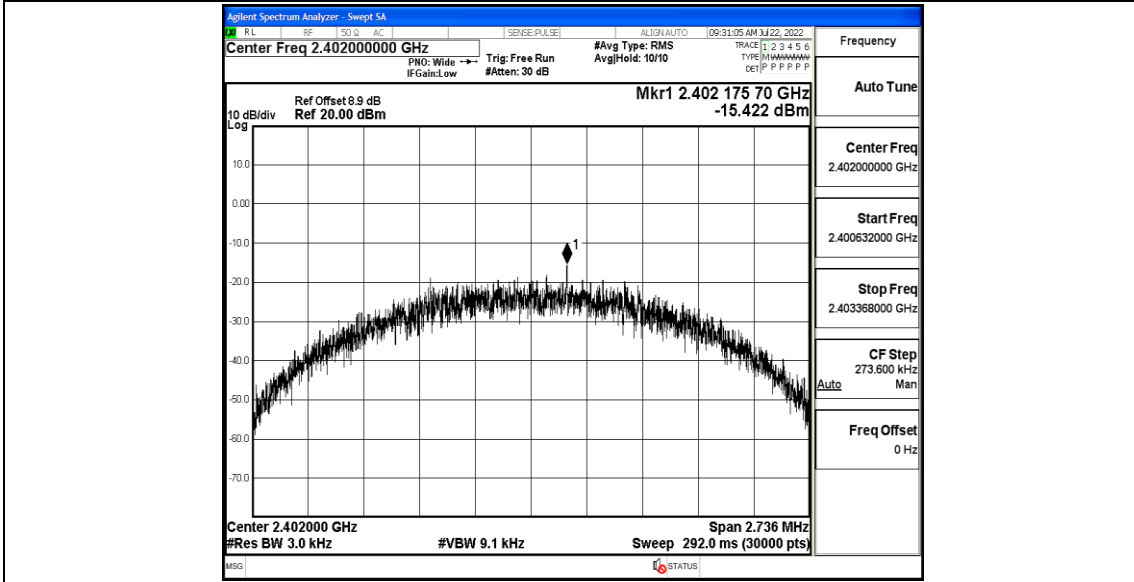
BLE_1M_Ant1_2440



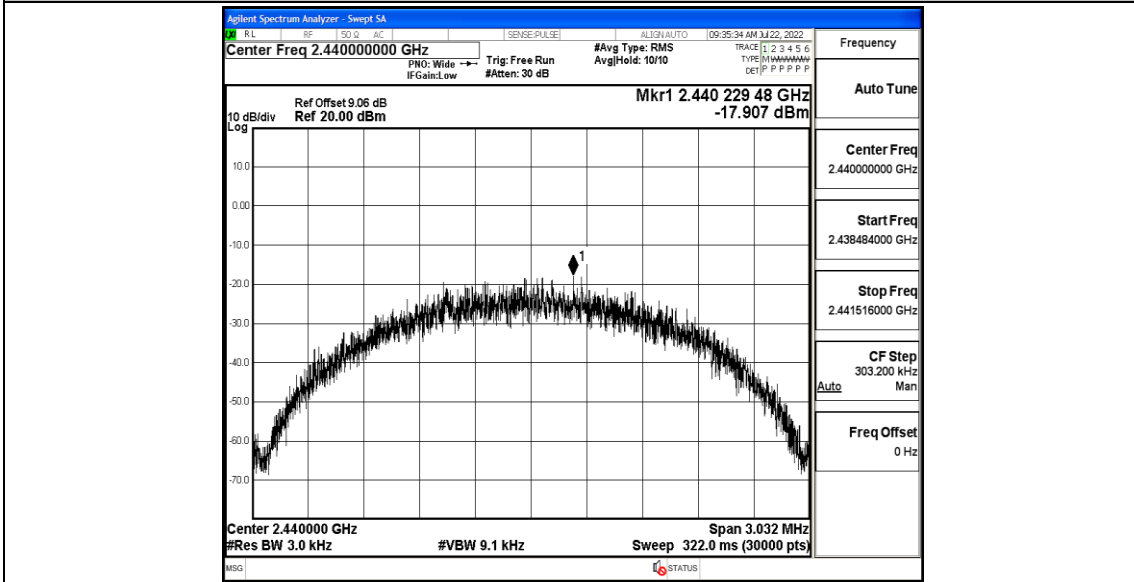
BLE_1M_Ant1_2480



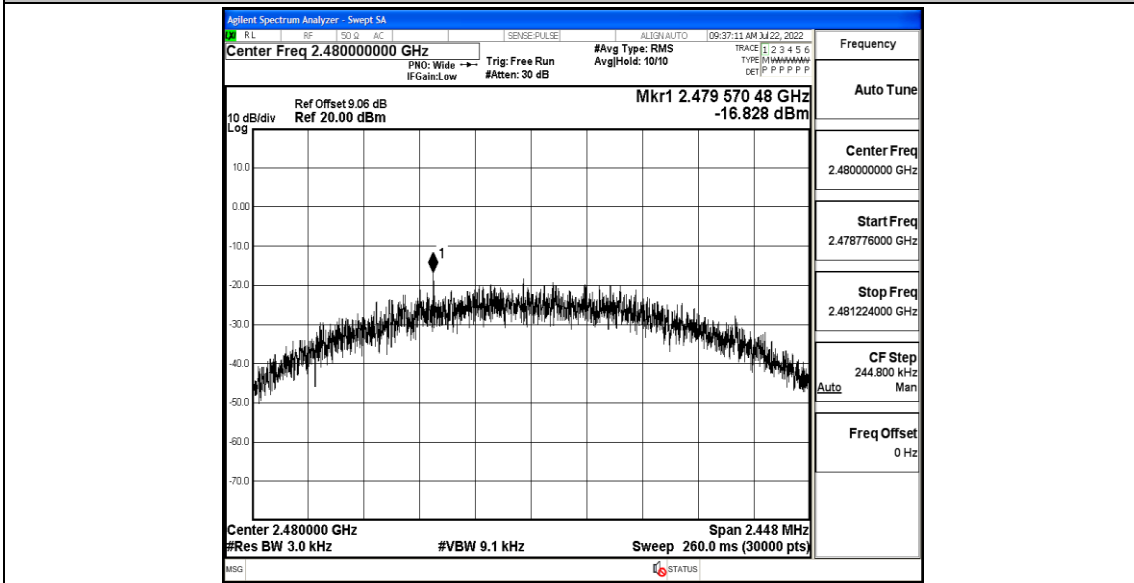
BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



BLE_2M_Ant1_2480



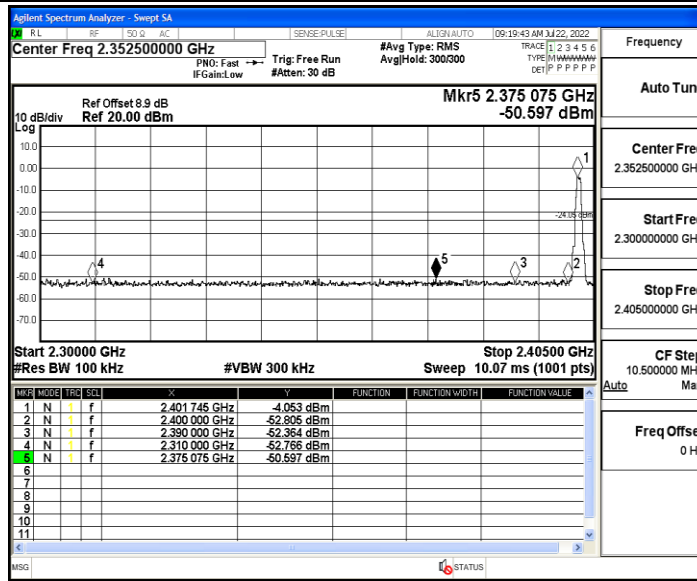
Appendix E: Band edge measurements

Test Result

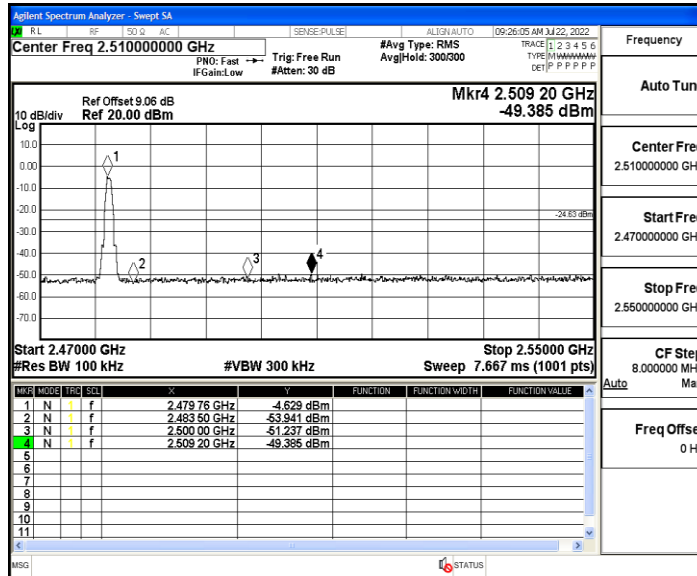
| TestMode | Antenna | ChName | Channel | RefLevel[dBm] | Result[dBm] | Limit[dBm] | Verdict |
|----------|---------|--------|---------|---------------|-------------|------------|---------|
| BLE_1M | Ant1 | Low | 2402 | -4.05 | -50.6 | ≤-24.05 | PASS |
| | | High | 2480 | -4.63 | -49.39 | ≤-24.63 | PASS |
| BLE_2M | Ant1 | Low | 2402 | -4.54 | -38.33 | ≤-24.54 | PASS |
| | | High | 2480 | -6.29 | -49.24 | ≤-26.29 | PASS |

Test Graphs

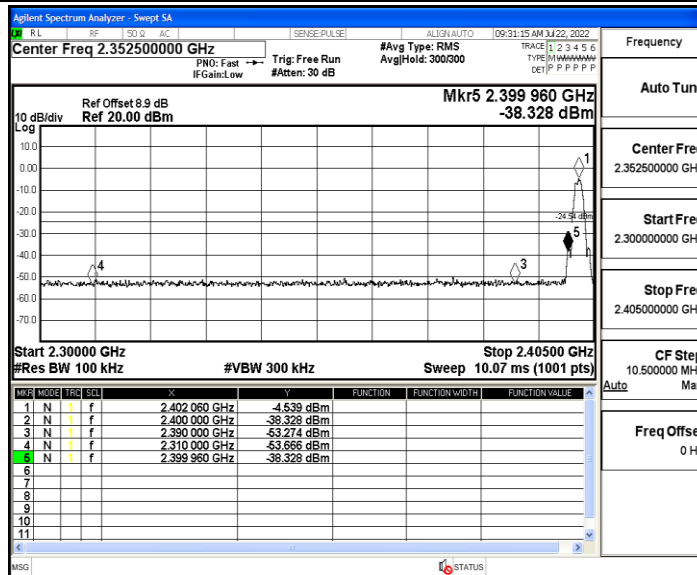
BLE_1M_Ant1_Low_2402



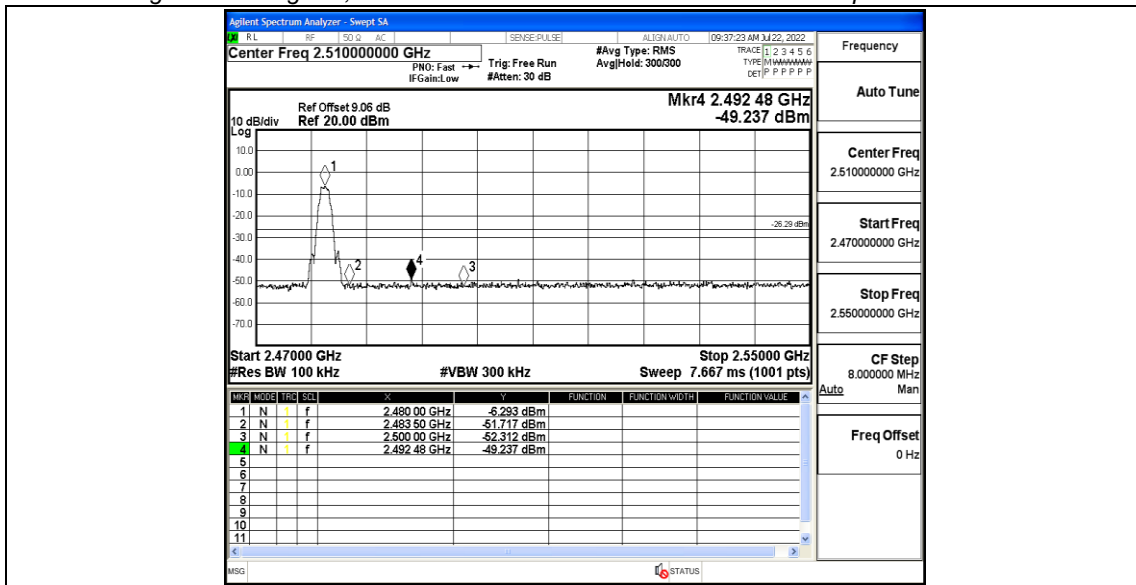
BLE_1M_Ant1_High_2480



BLE_2M_Ant1_Low_2402



BLE_2M_Ant1_High_2480

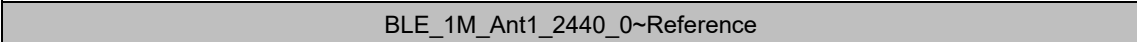
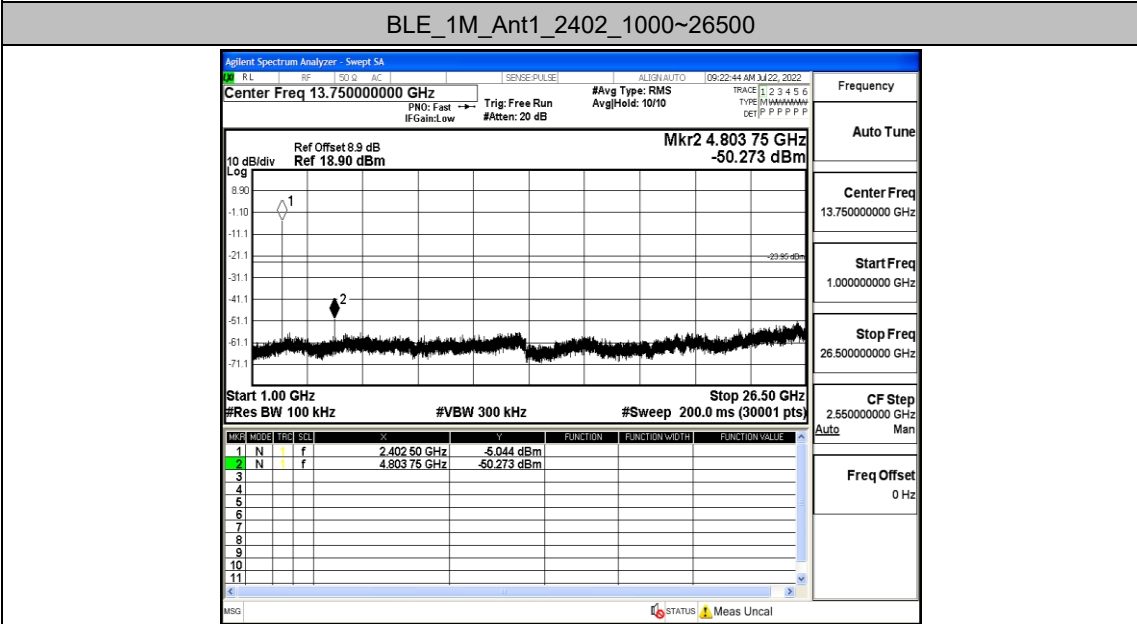
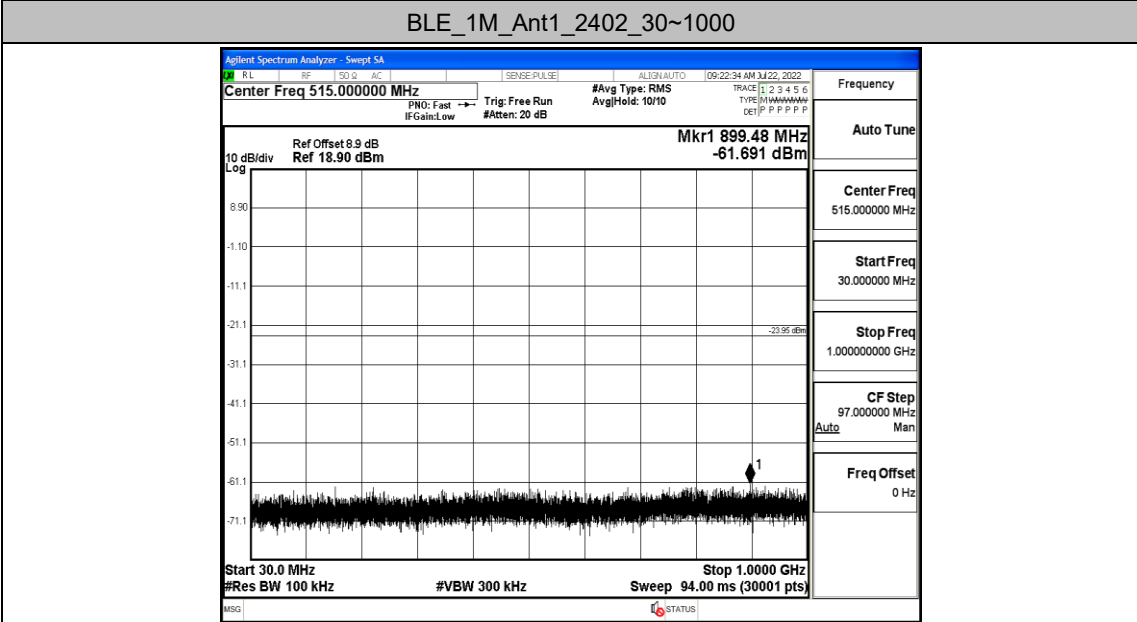
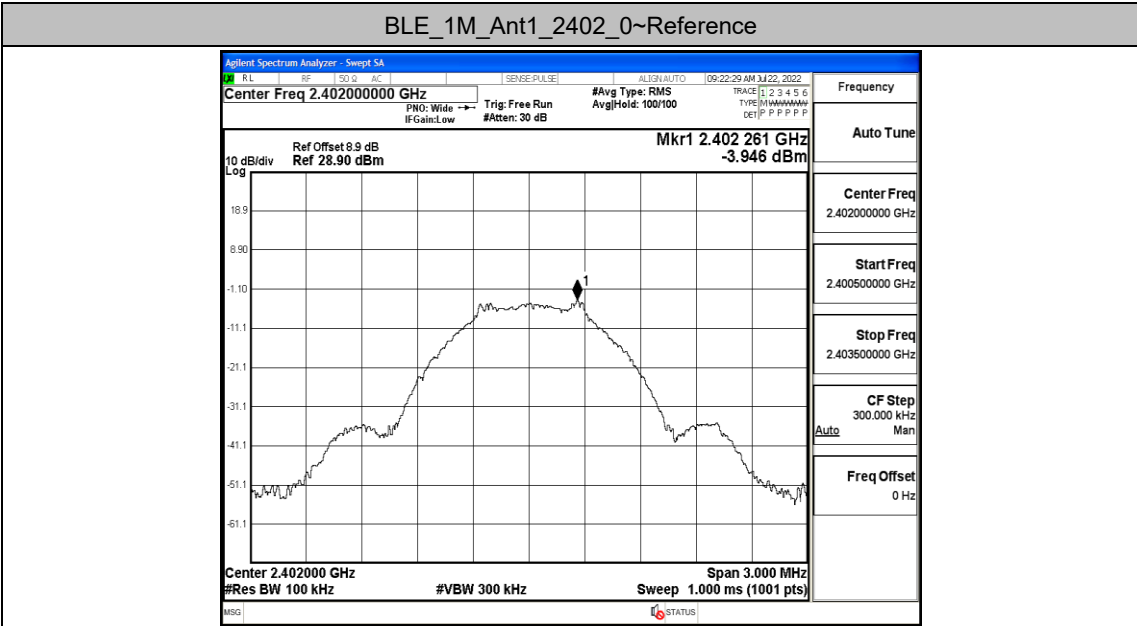


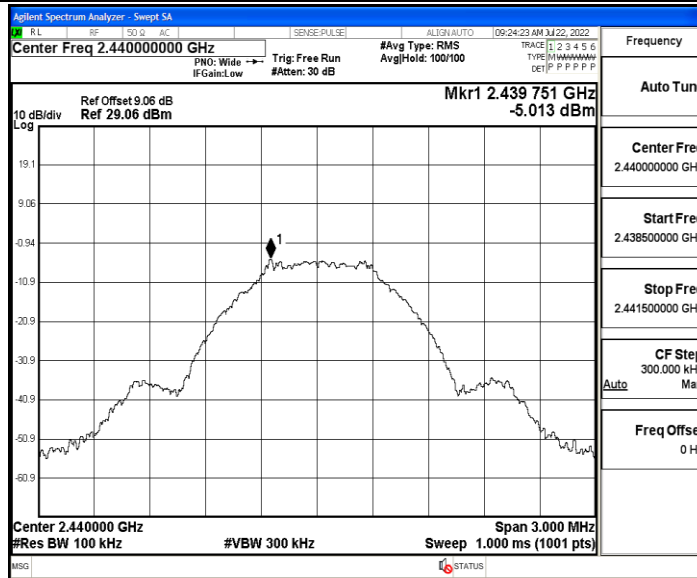
Appendix F: Conducted Spurious Emission

Test Result

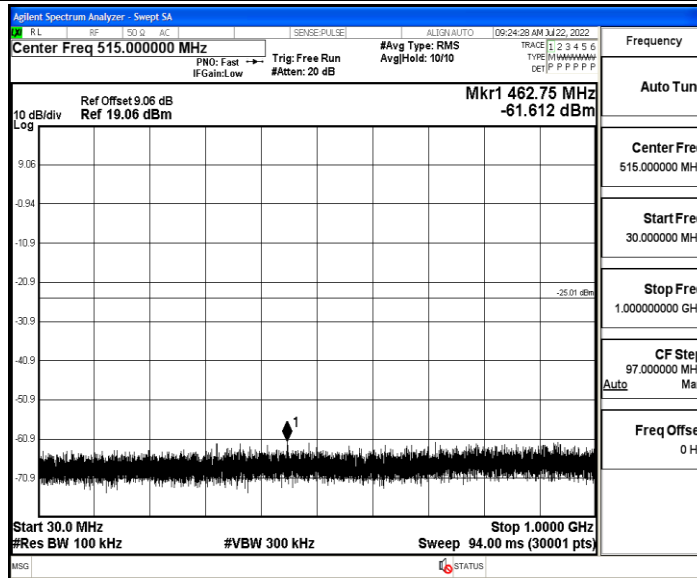
| TestMode | Antenna | Channel | FreqRange [MHz] | RefLevel [dBm] | Result[dBm] | Limit[dBm] | Verdict |
|----------|---------|---------|-----------------|----------------|-------------|------------|---------|
| BLE_1M | Ant1 | 2402 | Reference | -3.95 | -3.95 | --- | PASS |
| | | | 30~1000 | -3.95 | -61.69 | ≤-23.95 | PASS |
| | | | 1000~26500 | -3.95 | -50.27 | ≤-23.95 | PASS |
| | | 2440 | Reference | -5.01 | -5.01 | --- | PASS |
| | | | 30~1000 | -5.01 | -61.61 | ≤-25.01 | PASS |
| | | | 1000~26500 | -5.01 | -41.26 | ≤-25.01 | PASS |
| | | 2480 | Reference | -5.02 | -5.02 | --- | PASS |
| | | | 30~1000 | -5.02 | -61.05 | ≤-25.02 | PASS |
| | | | 1000~26500 | -5.02 | -50.25 | ≤-25.02 | PASS |
| BLE_2M | Ant1 | 2402 | Reference | -5.81 | -5.81 | --- | PASS |
| | | | 30~1000 | -5.81 | -61.39 | ≤-25.81 | PASS |
| | | | 1000~26500 | -5.81 | -51.3 | ≤-25.81 | PASS |
| | | 2440 | Reference | -6.17 | -6.17 | --- | PASS |
| | | | 30~1000 | -6.17 | -60.25 | ≤-26.17 | PASS |
| | | | 1000~26500 | -6.17 | -44.4 | ≤-26.17 | PASS |
| | | 2480 | Reference | -6.67 | -6.67 | --- | PASS |
| | | | 30~1000 | -6.67 | -61.58 | ≤-26.67 | PASS |
| | | | 1000~26500 | -6.67 | -51.39 | ≤-26.67 | PASS |

Test Graphs

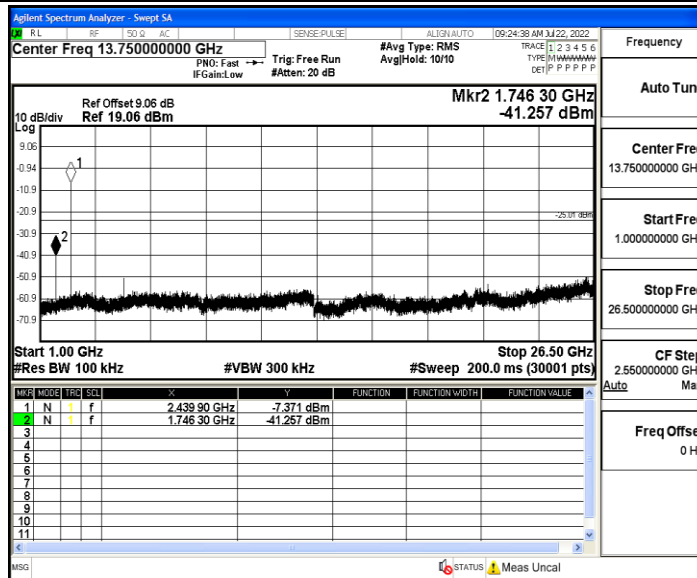




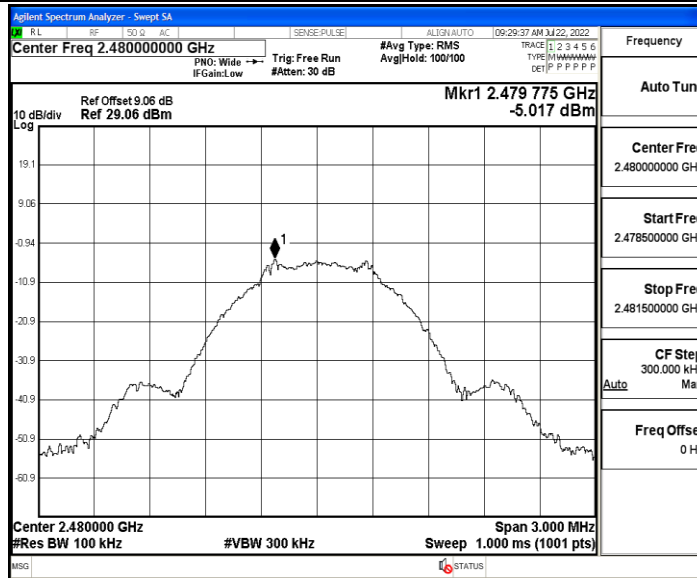
BLE_1M_Ant1_2440_30~1000



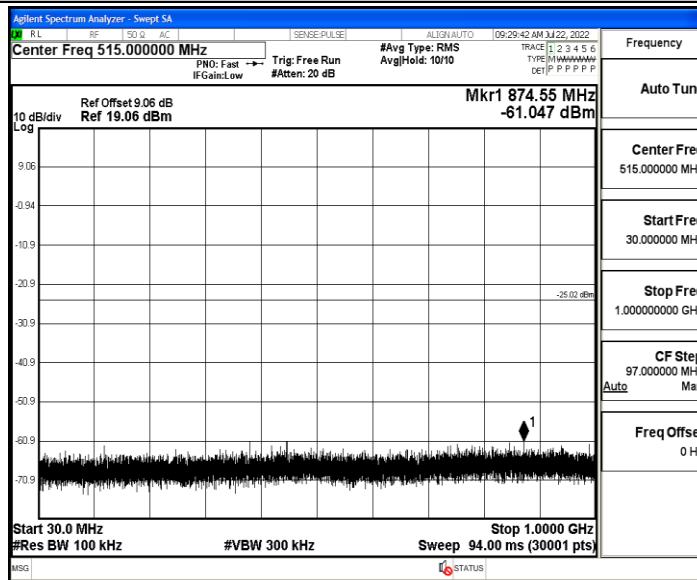
BLE_1M_Ant1_2440_1000~26500



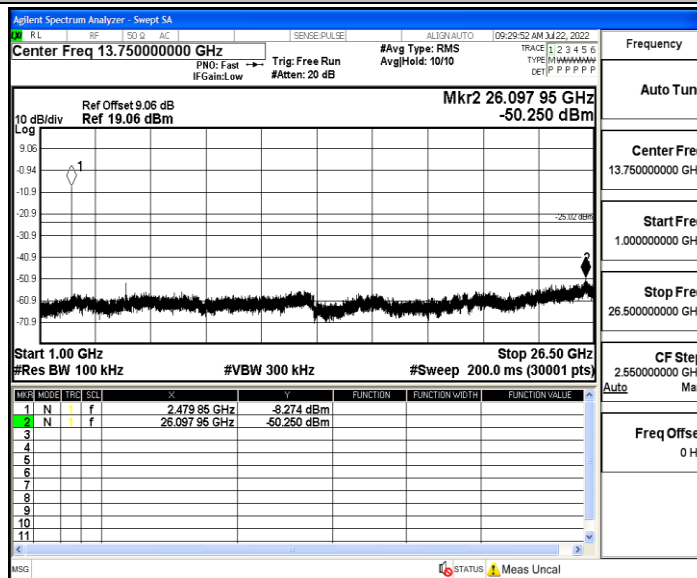
BLE_1M_Ant1_2480_0~Reference



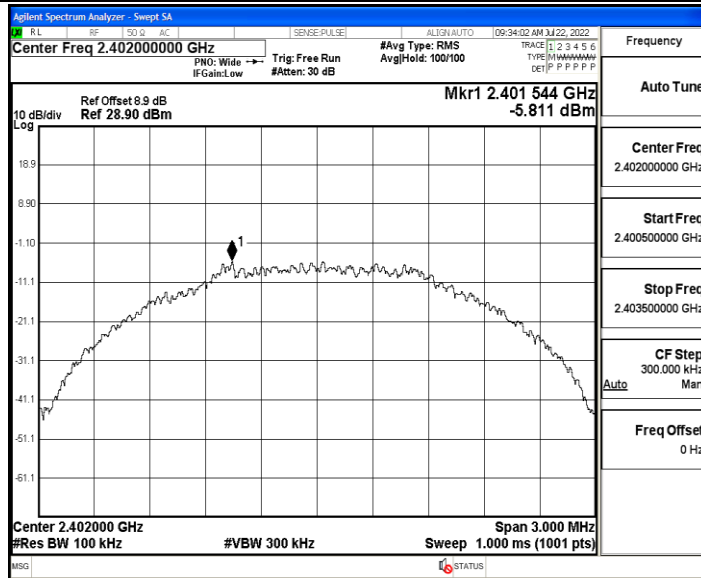
BLE_1M_Ant1_2480_30~1000



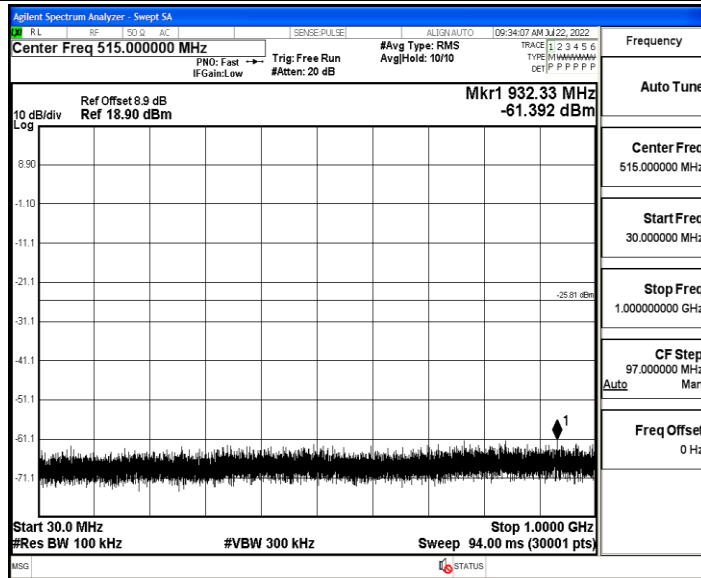
BLE_1M_Ant1_2480_1000~26500



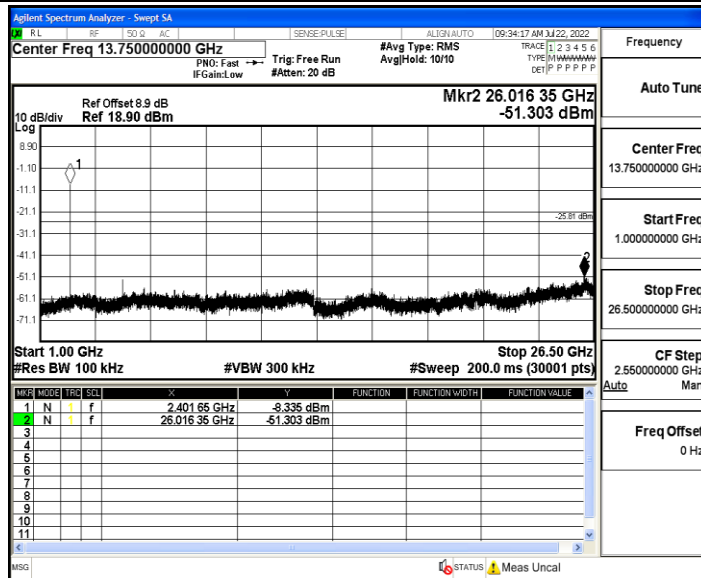
BLE_2M_Ant1_2402_0~Reference



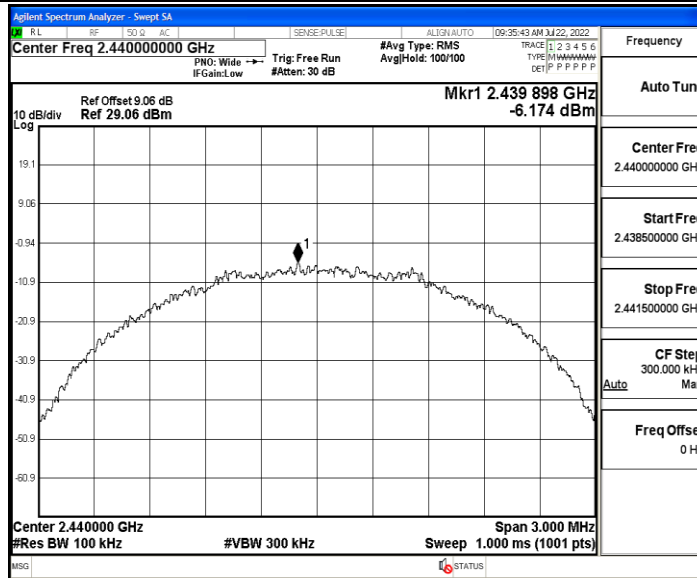
BLE_2M_Ant1_2402_30~1000



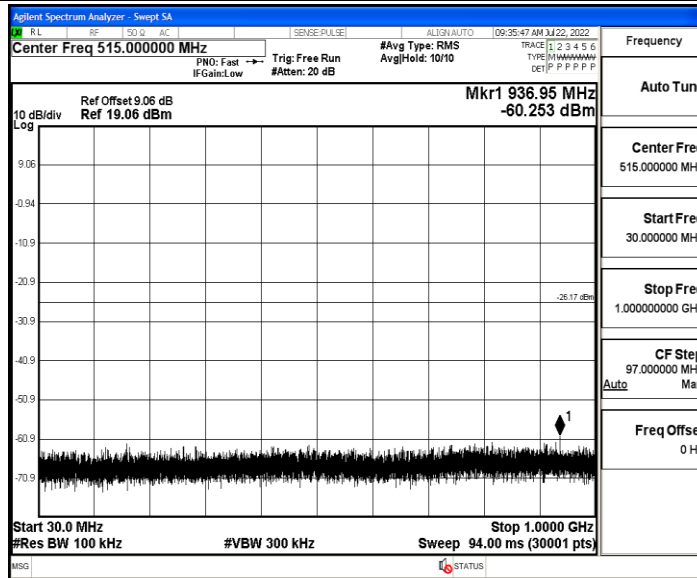
BLE_2M_Ant1_2402_1000~26500



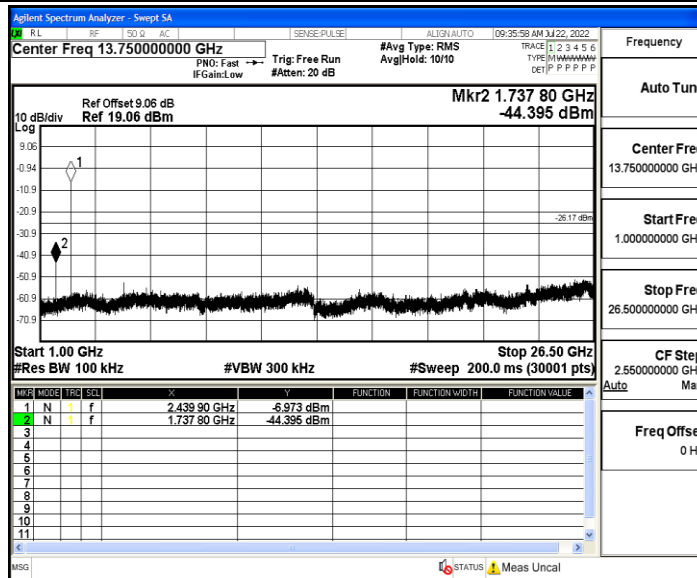
BLE_2M_Ant1_2440_0~Reference



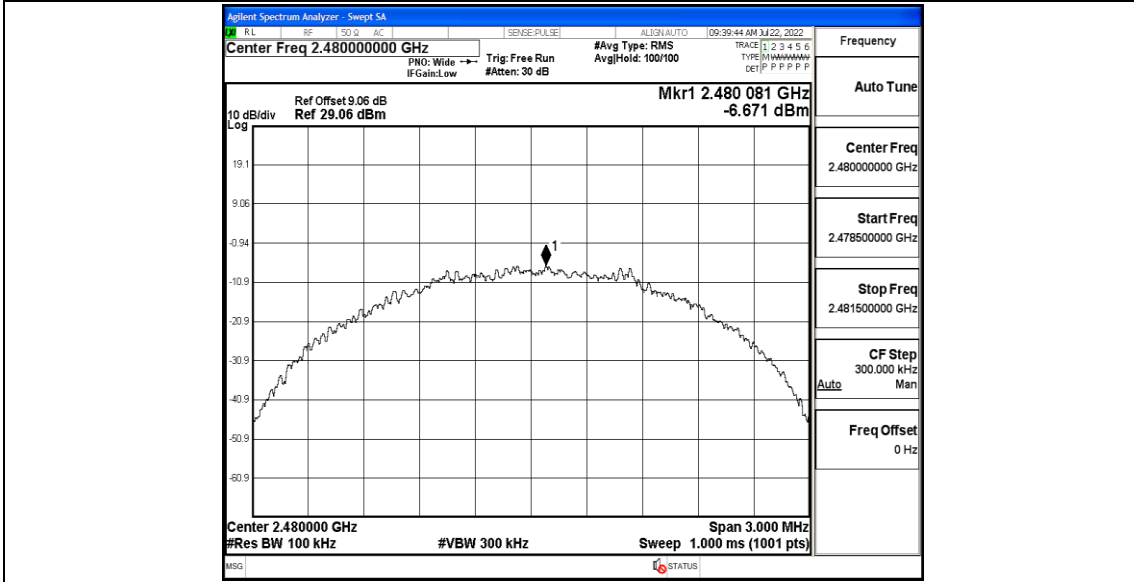
BLE_2M_Ant1_2440_30~1000



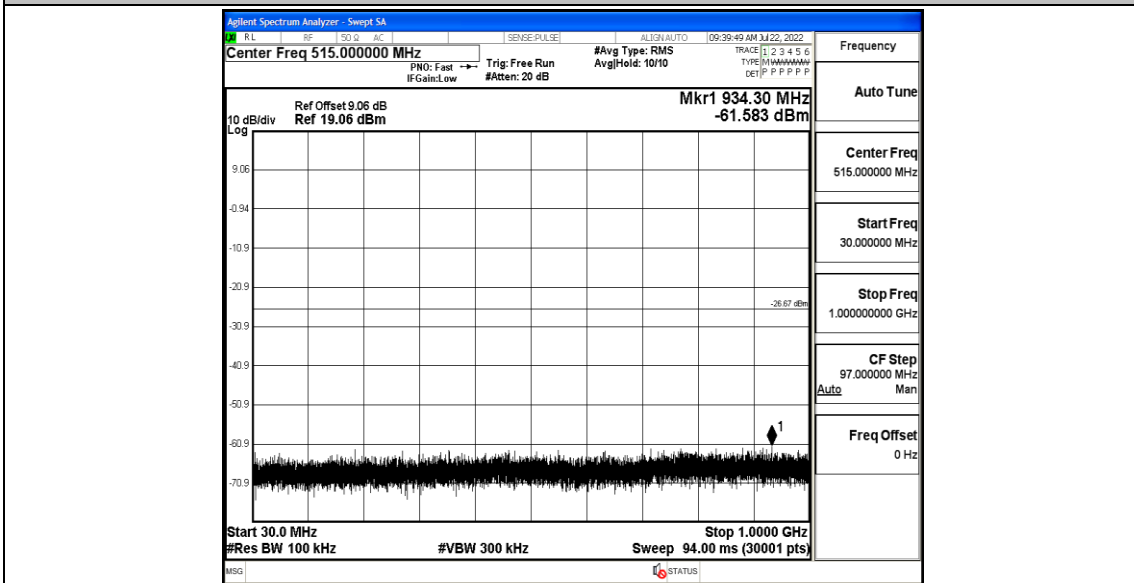
BLE_2M_Ant1_2440_1000~26500



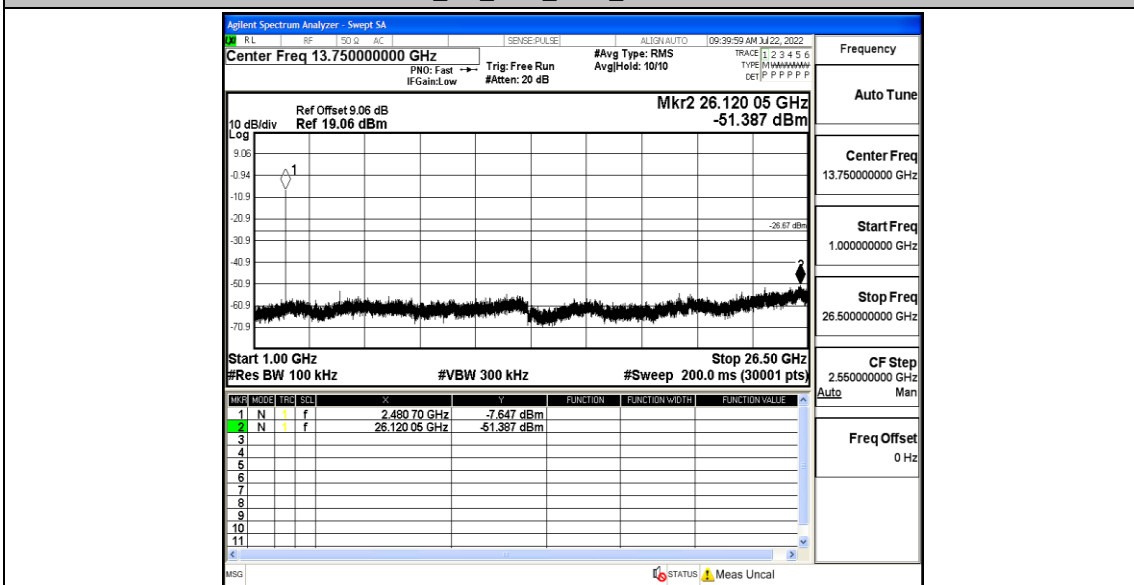
BLE_2M_Ant1_2480_0~Reference



BLE_2M_Ant1_2480_30~1000



BLE_2M_Ant1_2480_1000~26500

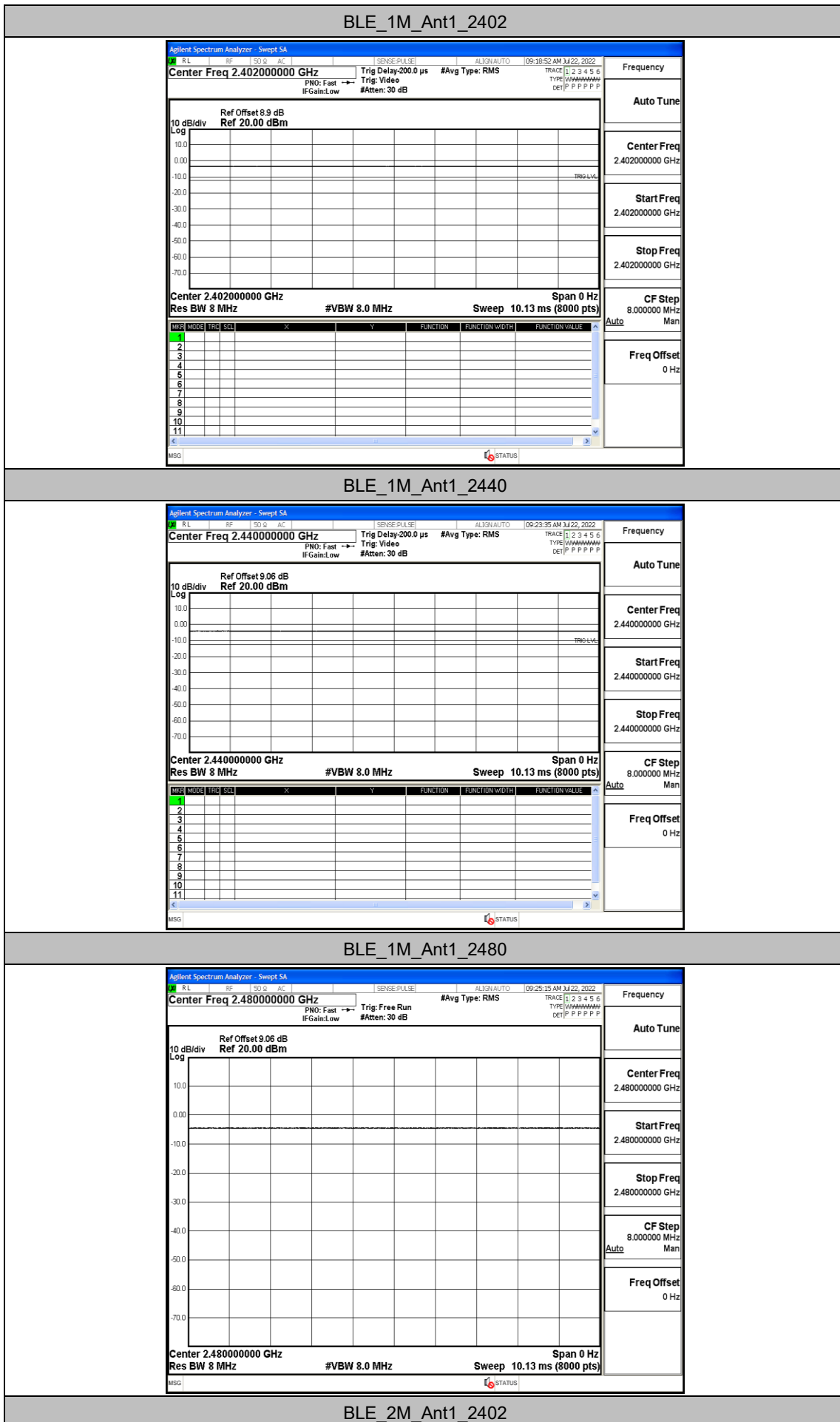


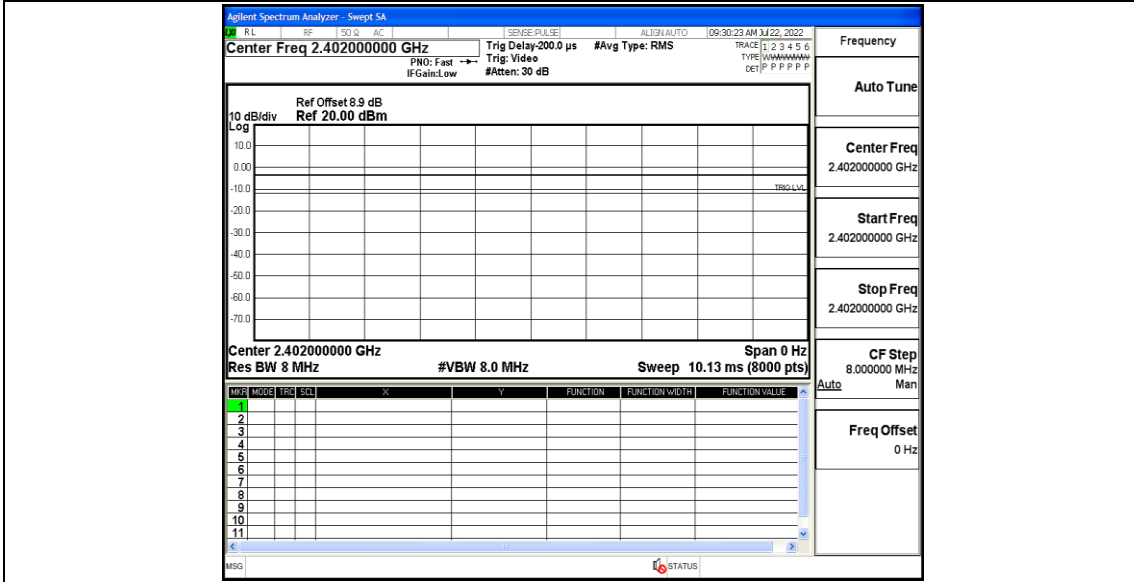
Appendix G: Duty Cycle

Test Result

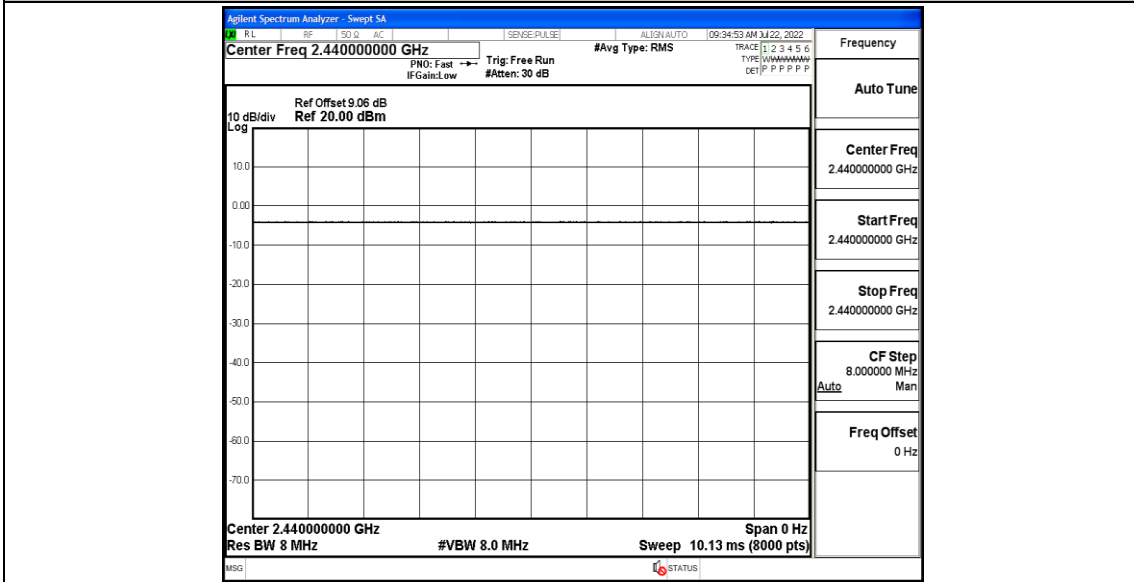
| TestMode | Antenna | Channel | Transmission Duration [ms] | Transmission Period [ms] | Duty Cycle [%] | 1/T[kHz] |
|----------|---------|---------|----------------------------|--------------------------|----------------|----------|
| BLE_1M | Ant1 | 2402 | 10.00 | 10.00 | 100.00 | 0.10 |
| | | 2440 | 10.00 | 10.00 | 100.00 | 0.10 |
| | | 2480 | 0.00 | 0.00 | 100 | ∞ |
| BLE_2M | Ant1 | 2402 | 10.00 | 10.00 | 100.00 | 0.10 |
| | | 2440 | 0.00 | 0.00 | 100 | ∞ |
| | | 2480 | 0.00 | 0.00 | 100 | ∞ |

Test Graphs

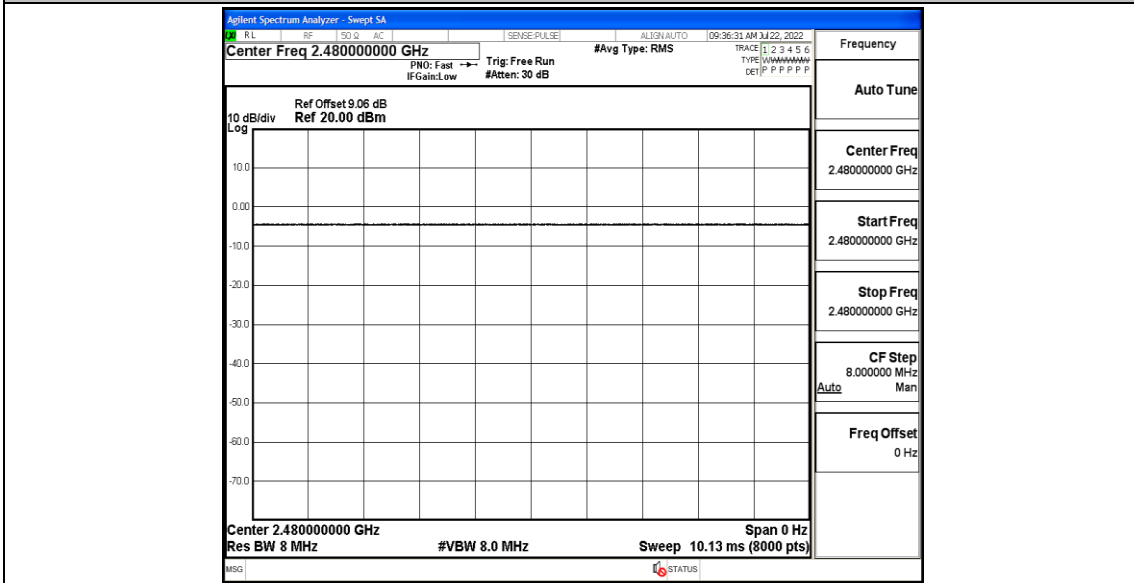




BLE_2M_Ant1_2440



BLE_2M_Ant1_2480



Appendix H: Emissions in Restricted Bands

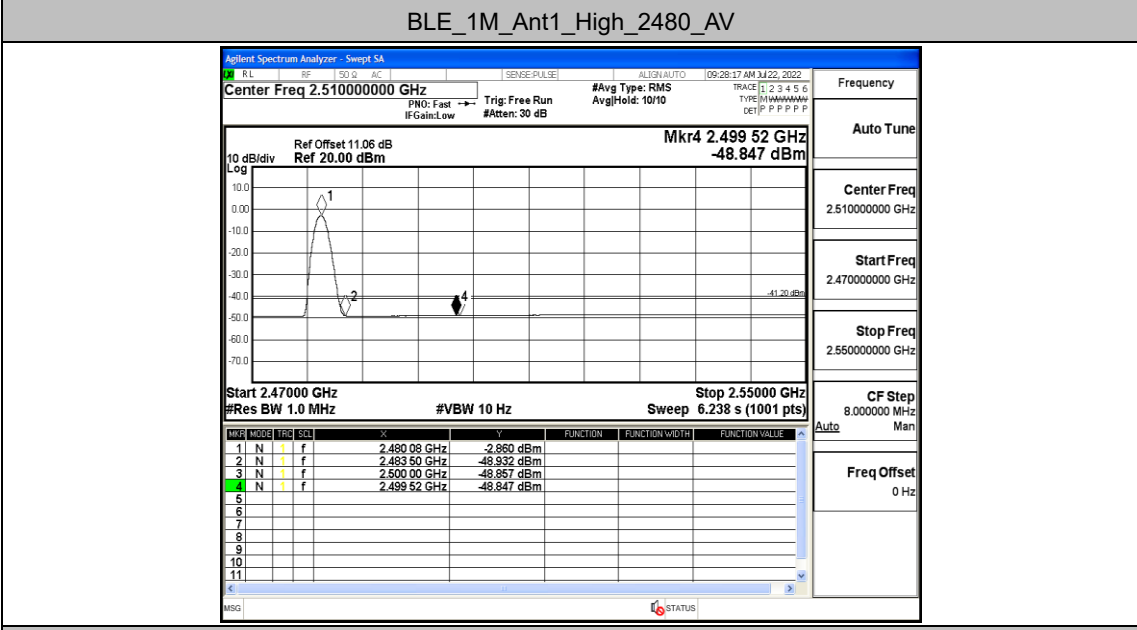
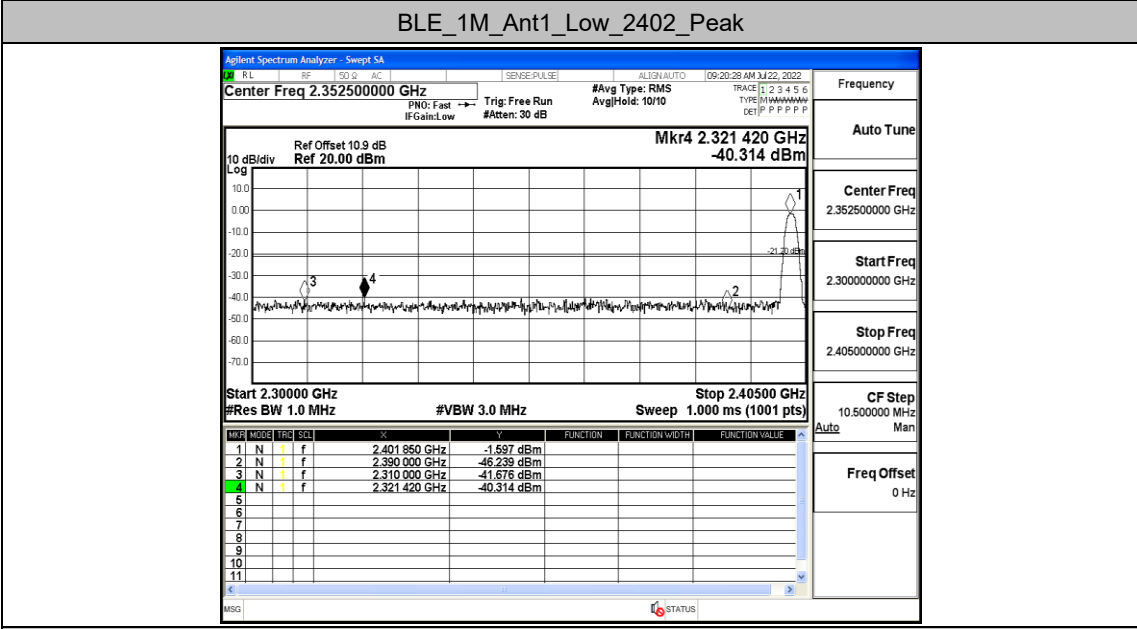
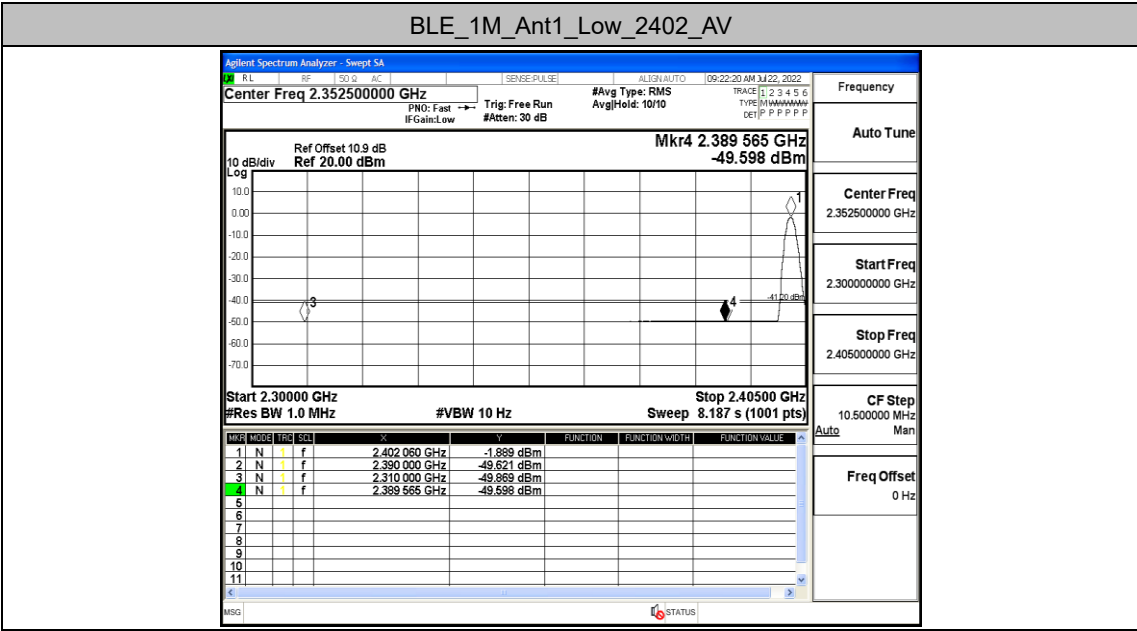
Test Result

| TestMode | Antenna | ChName | Channel | Detector | Freq. [MHz] | Result [dBm] | Limit [dBm] | Verdict |
|----------|---------|--------|---------|----------|-------------|--------------|-------------|---------|
| BLE_1M | Ant1 | Low | 2402 | AV | 2310.000 | -49.87 | ≤-41.20 | PASS |
| | | | | AV | 2389.565 | -49.6 | ≤-41.20 | PASS |
| | | | | AV | 2390.000 | -49.62 | ≤-41.20 | PASS |
| | | | | Peak | 2310.000 | -41.68 | ≤-21.20 | PASS |
| | | | | Peak | 2321.420 | -40.31 | ≤-21.20 | PASS |
| | | | | Peak | 2390.000 | -46.24 | ≤-21.20 | PASS |
| | | High | 2480 | AV | 2483.500 | -48.93 | ≤-41.20 | PASS |
| | | | | AV | 2499.520 | -48.85 | ≤-41.20 | PASS |
| | | | | AV | 2500.000 | -48.86 | ≤-41.20 | PASS |
| | | | | Peak | 2483.500 | -44.07 | ≤-21.20 | PASS |
| | | | | Peak | 2490.160 | -39.59 | ≤-21.20 | PASS |
| | | | | Peak | 2500.000 | -44.9 | ≤-21.20 | PASS |
| BLE_2M | Ant1 | Low | 2402 | AV | 2310.000 | -49.85 | ≤-41.20 | PASS |
| | | | | AV | 2389.985 | -49.56 | ≤-41.20 | PASS |
| | | | | AV | 2390.000 | -49.56 | ≤-41.20 | PASS |
| | | | | Peak | 2310.000 | -45.79 | ≤-21.20 | PASS |
| | | | | Peak | 2323.520 | -39.83 | ≤-21.20 | PASS |
| | | | | Peak | 2390.000 | -45.55 | ≤-21.20 | PASS |
| | | High | 2480 | AV | 2483.500 | -47.7 | ≤-41.20 | PASS |
| | | | | AV | 2483.520 | -47.7 | ≤-41.20 | PASS |
| | | | | AV | 2500.000 | -48.86 | ≤-41.20 | PASS |
| | | | | Peak | 2483.500 | -40.17 | ≤-21.20 | PASS |
| | | | | Peak | 2494.160 | -39.57 | ≤-21.20 | PASS |
| | | | | Peak | 2500.000 | -44.2 | ≤-21.20 | PASS |

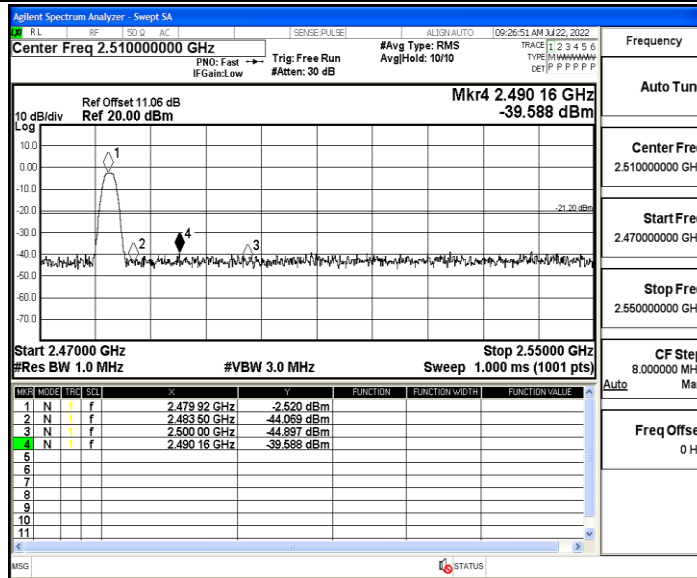
Note:

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.

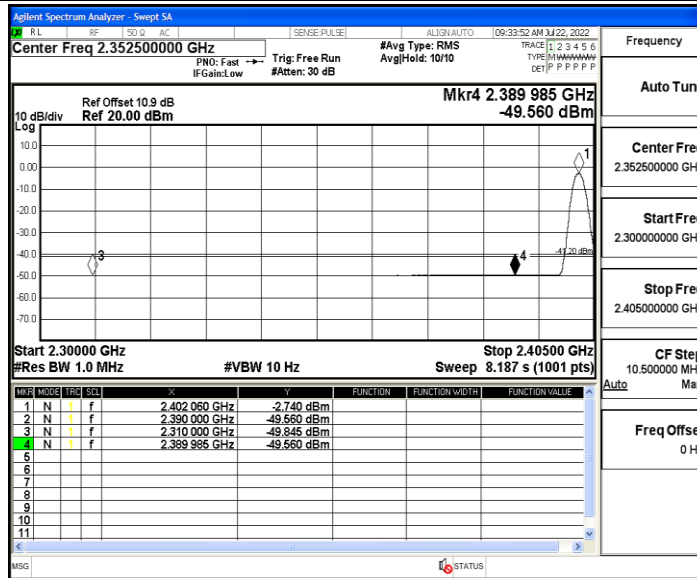
Test Graphs



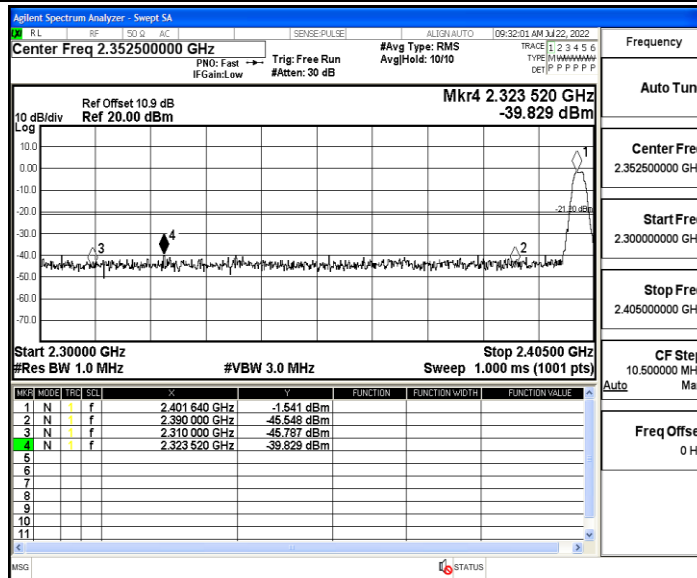
BLE_1M_Ant1_High_2480_Peak



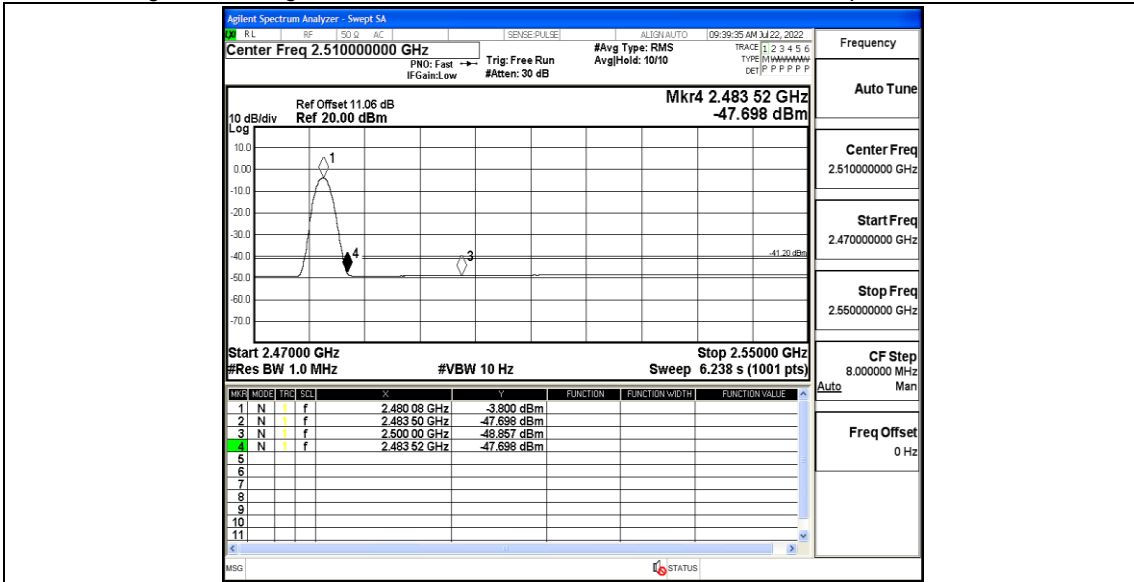
BLE_2M_Ant1_Low_2402_AV



BLE_2M_Ant1_Low_2402_Peak



BLE_2M_Ant1_High_2480_AV



BLE_2M_Ant1_High_2480_Peak

