

Appendix: Bluetooth LE

Contents

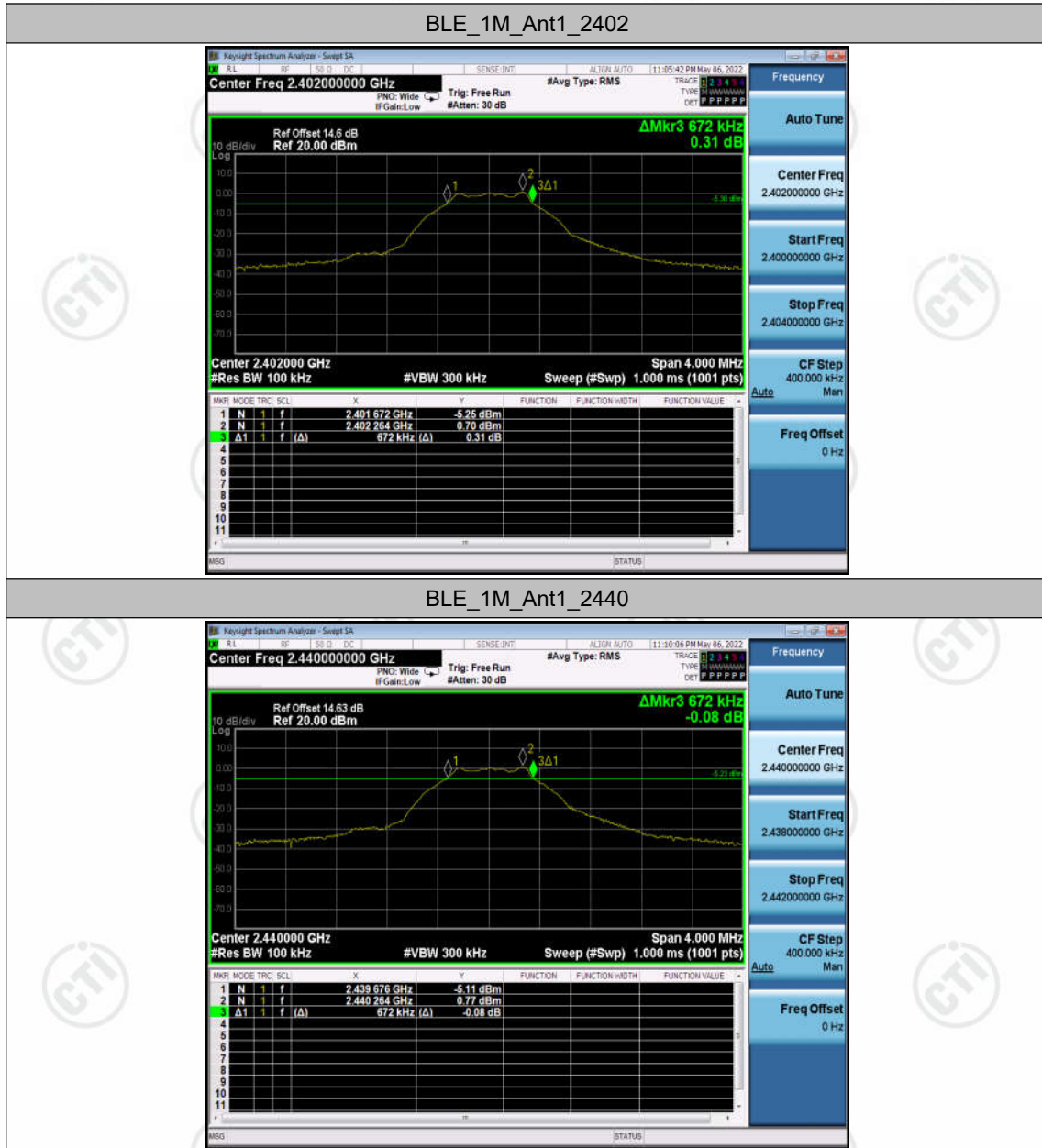
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Appendix A: DTS Bandwidth

Test Result

| Test Mode | Antenna | Frequency[MHz] | DTS BW [MHz] | FL[MHz] | FH[MHz] | Limit[MHz] | Verdict |
|-----------|---------|----------------|--------------|----------|----------|------------|---------|
| BLE_1M | Ant1 | 2402 | 0.672 | 2401.672 | 2402.344 | 0.5 | PASS |
| | | 2440 | 0.672 | 2439.676 | 2440.348 | 0.5 | PASS |
| | | 2480 | 0.676 | 2479.672 | 2480.348 | 0.5 | PASS |
| BLE_2M | Ant1 | 2402 | 1.164 | 2401.440 | 2402.604 | 0.5 | PASS |
| | | 2440 | 1.172 | 2439.432 | 2440.604 | 0.5 | PASS |
| | | 2480 | 1.164 | 2479.436 | 2480.600 | 0.5 | PASS |

Test Graphs



BLE_1M_Ant1_2480



BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



BLE_2M_Ant1_2480

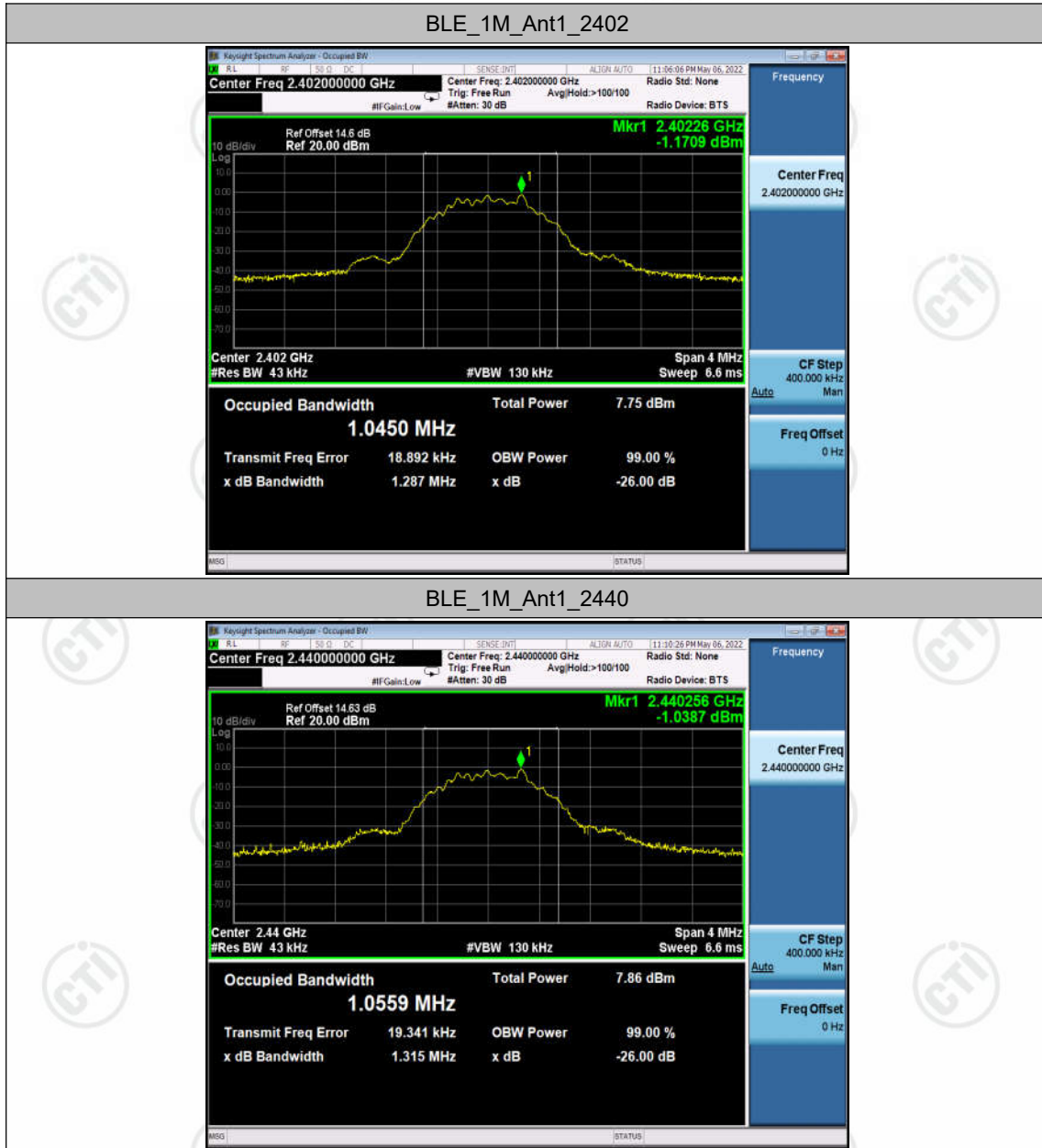


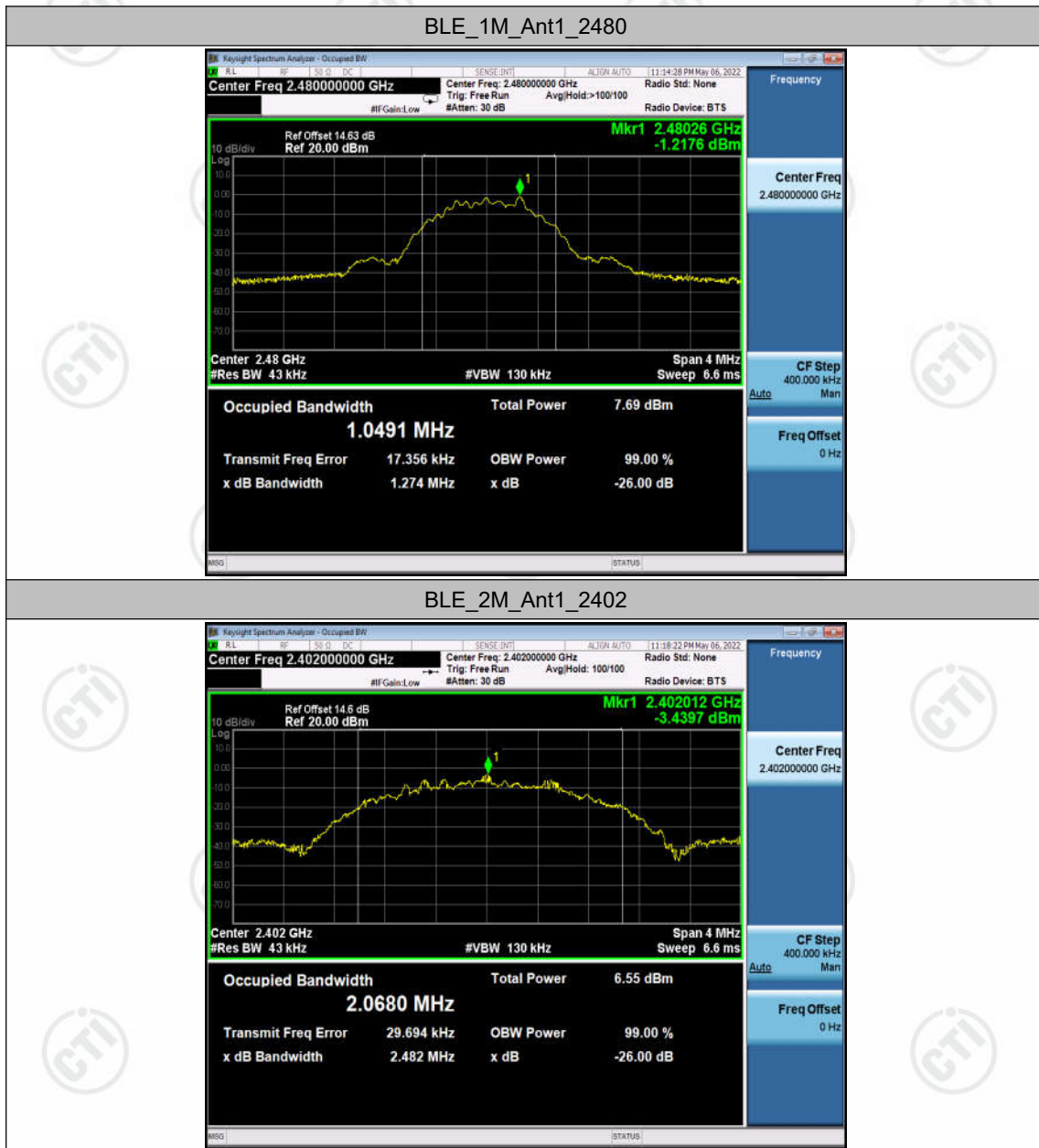
Appendix B: Occupied Channel Bandwidth

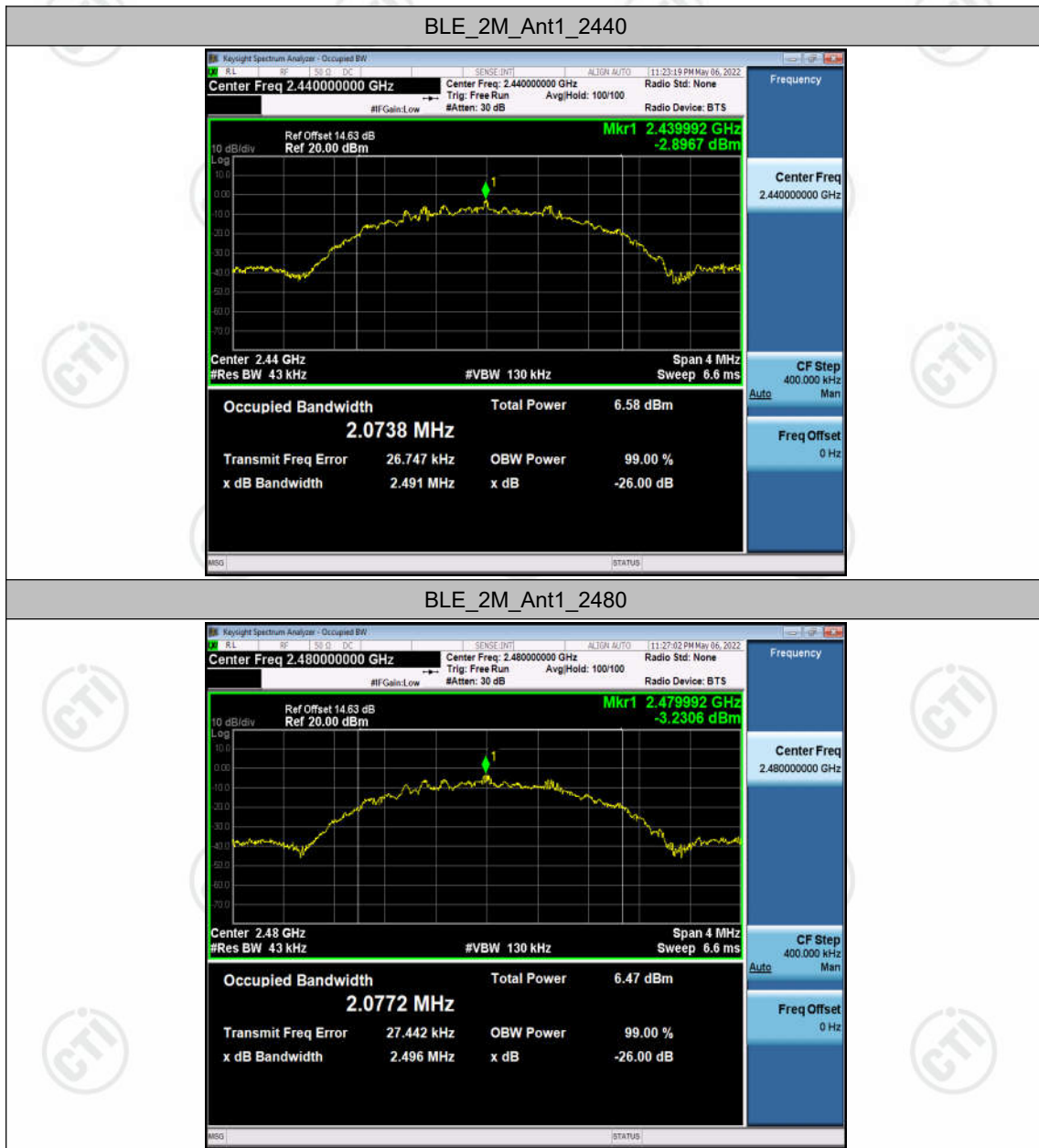
Test Result

| Test Mode | Antenna | Frequency[MHz] | OCB [MHz] | FL[MHz] | FH[MHz] | Limit[MHz] | Verdict |
|-----------|---------|----------------|-----------|----------|----------|------------|---------|
| BLE_1M | Ant1 | 2402 | 1.0448 | 2401.497 | 2402.541 | --- | --- |
| | | 2440 | 1.0558 | 2439.491 | 2440.547 | --- | --- |
| | | 2480 | 1.0492 | 2479.493 | 2480.542 | --- | --- |
| BLE_2M | Ant1 | 2402 | 2.0680 | 2400.996 | 2403.064 | --- | --- |
| | | 2440 | 2.0738 | 2438.990 | 2441.064 | --- | --- |
| | | 2480 | 2.0772 | 2478.989 | 2481.066 | --- | --- |

Test Graphs





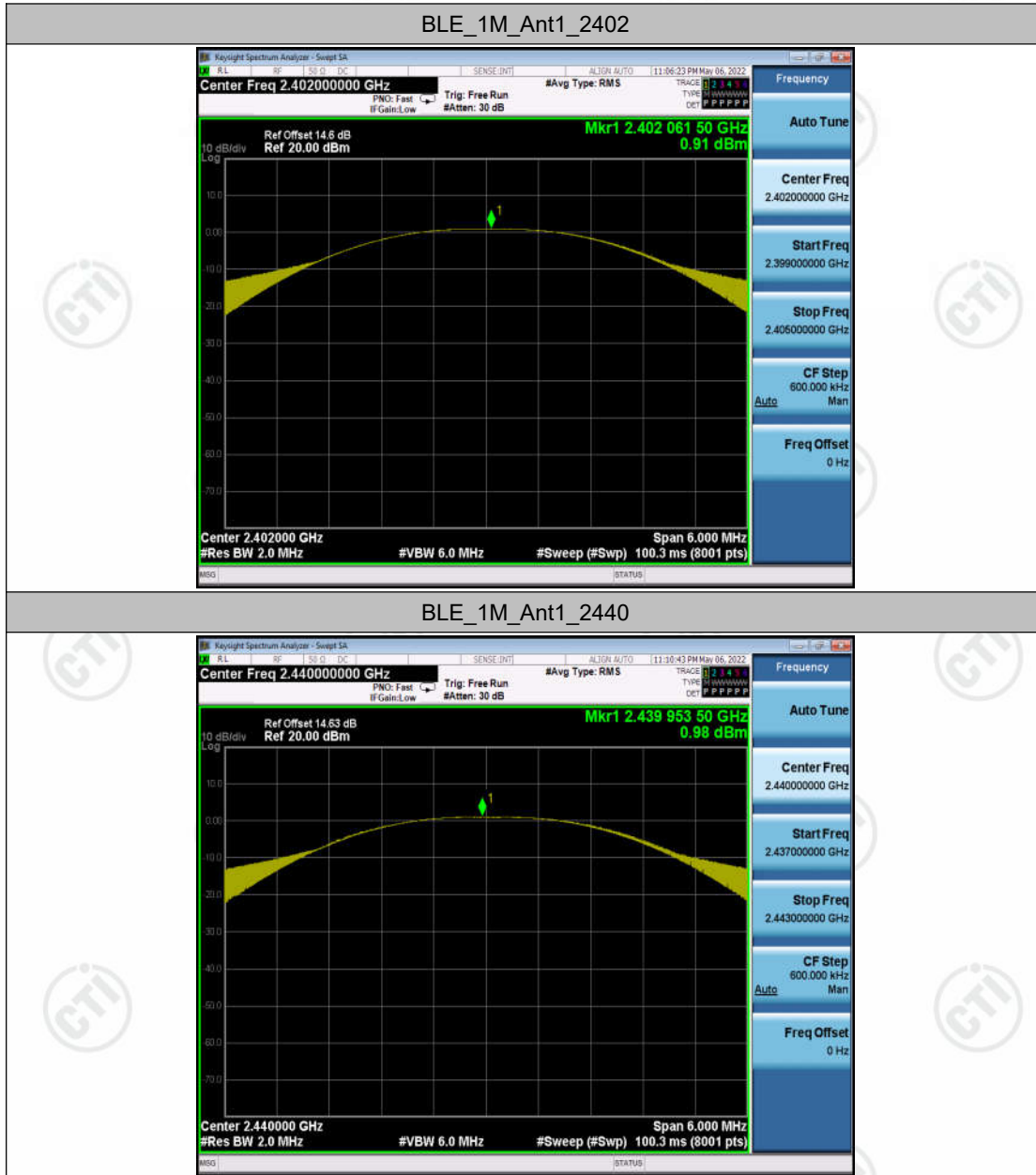


Appendix C: Maximum conducted output power

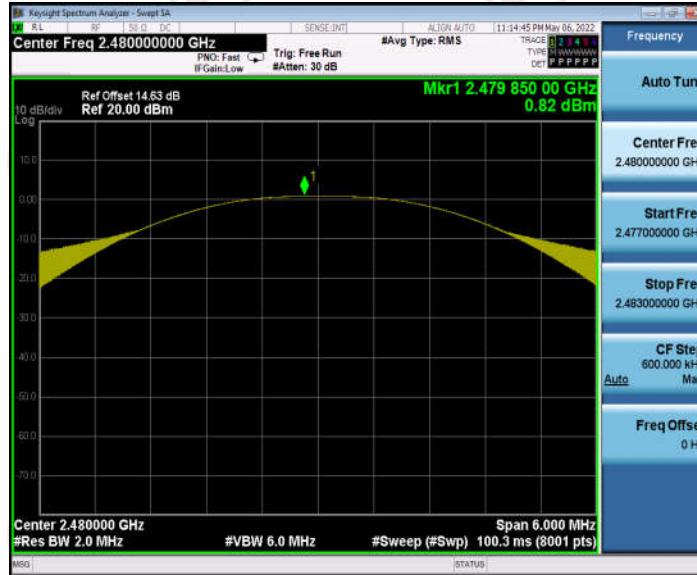
Test Result Peak

| Test Mode | Antenna | Channel | Result[dBm] | Limit[dBm] | Verdict |
|-----------|---------|-------------|-------------|------------|---------|
| BLE_1M | Ant1 | 2402 | 0.91 | ≤30 | PASS |
| | | 2440 | 0.98 | ≤30 | PASS |
| | | 2480 | 0.82 | ≤30 | PASS |
| BLE_2M | Ant1 | 2402 | 0.89 | ≤30 | PASS |
| | | 2440 | 1 | ≤30 | PASS |
| | | 2480 | 0.83 | ≤30 | PASS |

Test Graphs Peak



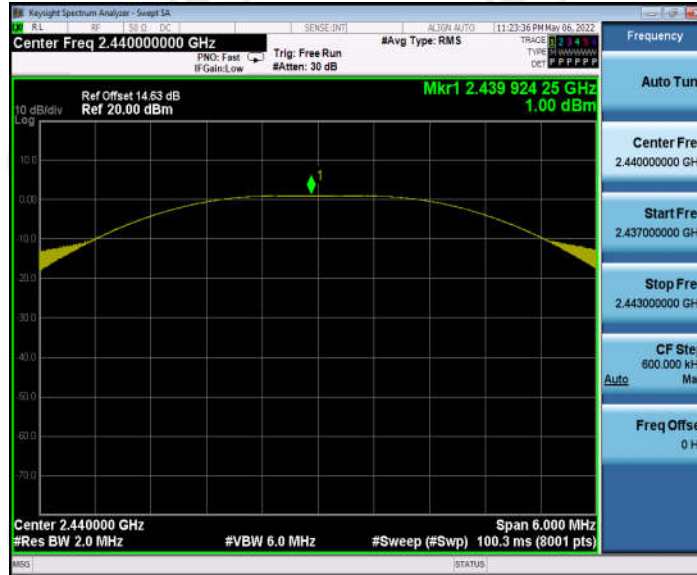
BLE_1M_Ant1_2480



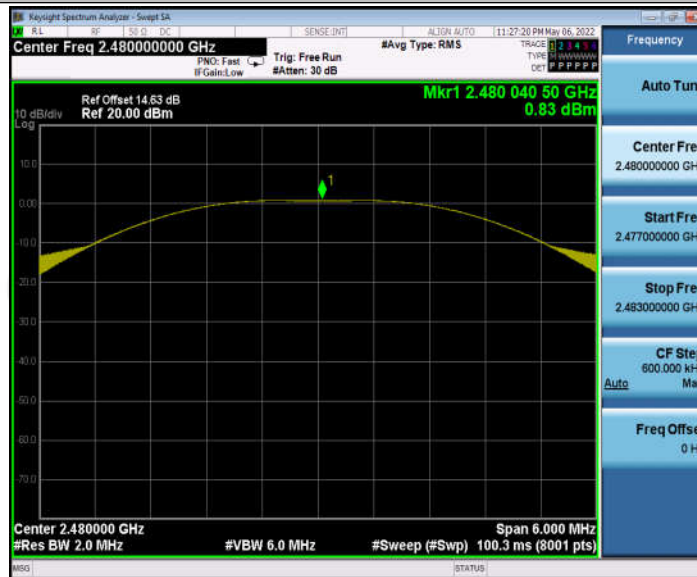
BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



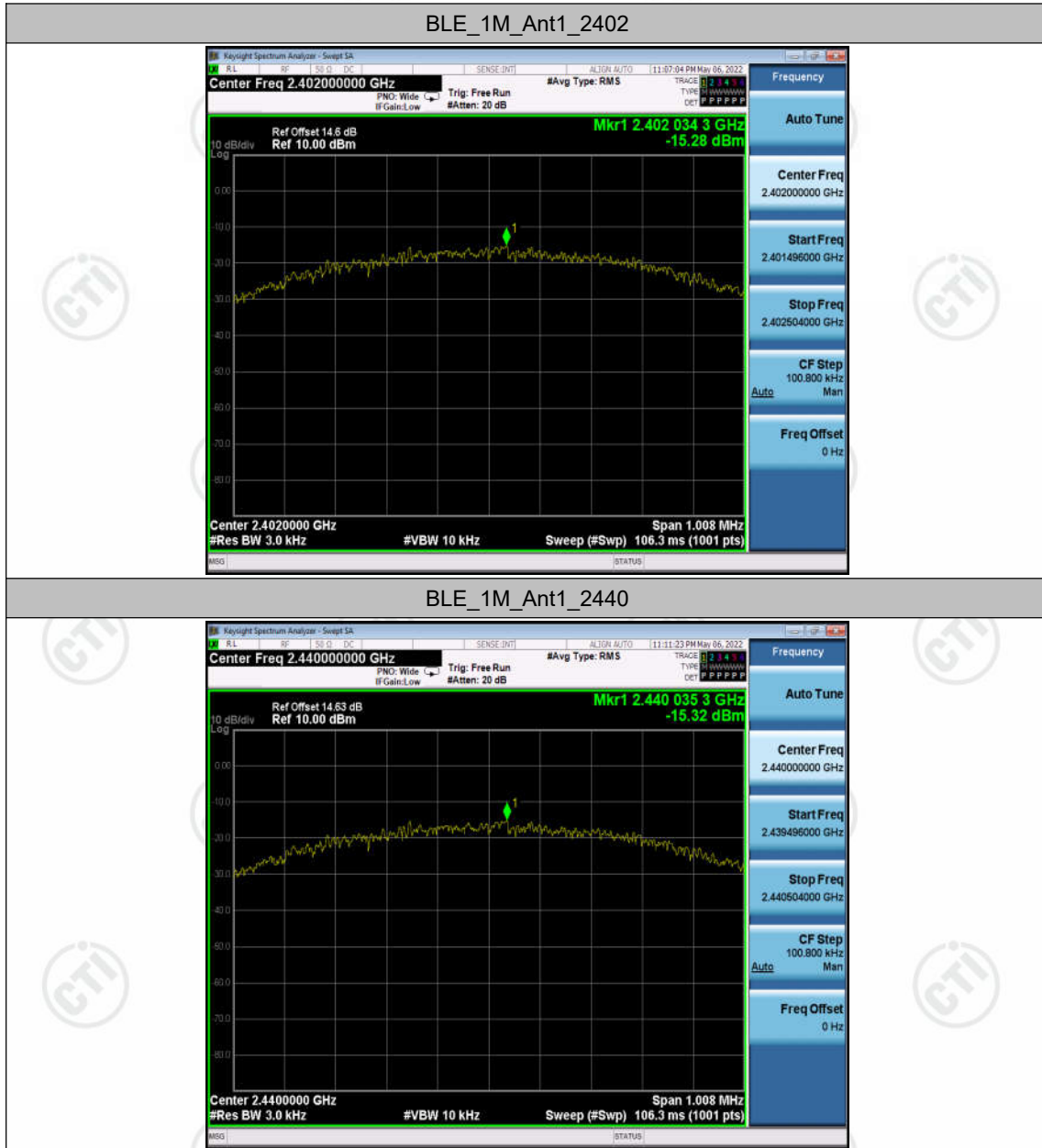
BLE_2M_Ant1_2480



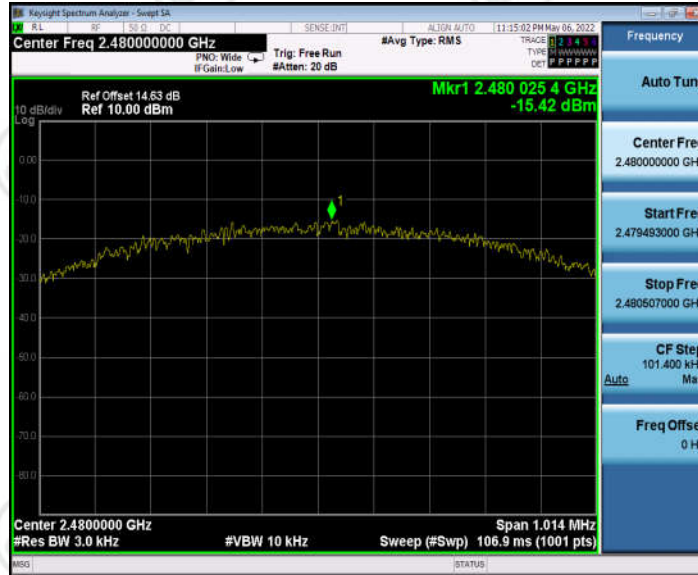
Appendix D: Maximum power spectral density**Test Result**

| Test Mode | Antenna | Frequency[MHz] | Result[dBm/3kHz] | Limit[dBm/3kHz] | Verdict |
|-----------|---------|----------------|------------------|-----------------|---------|
| BLE_1M | Ant1 | 2402 | -15.29 | ≤8.00 | PASS |
| | | 2440 | -15.32 | ≤8.00 | PASS |
| | | 2480 | -15.42 | ≤8.00 | PASS |
| BLE_2M | Ant1 | 2402 | -17.67 | ≤8.00 | PASS |
| | | 2440 | -17.65 | ≤8.00 | PASS |
| | | 2480 | -17.85 | ≤8.00 | PASS |

Test Graphs



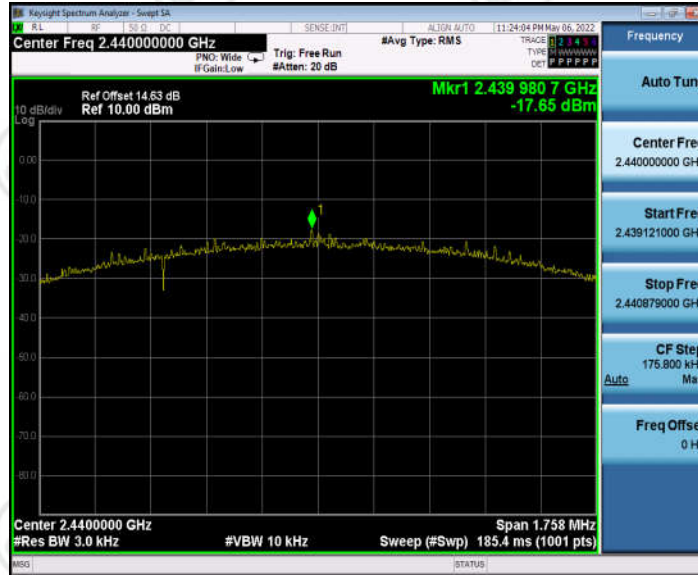
BLE_1M_Ant1_2480



BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



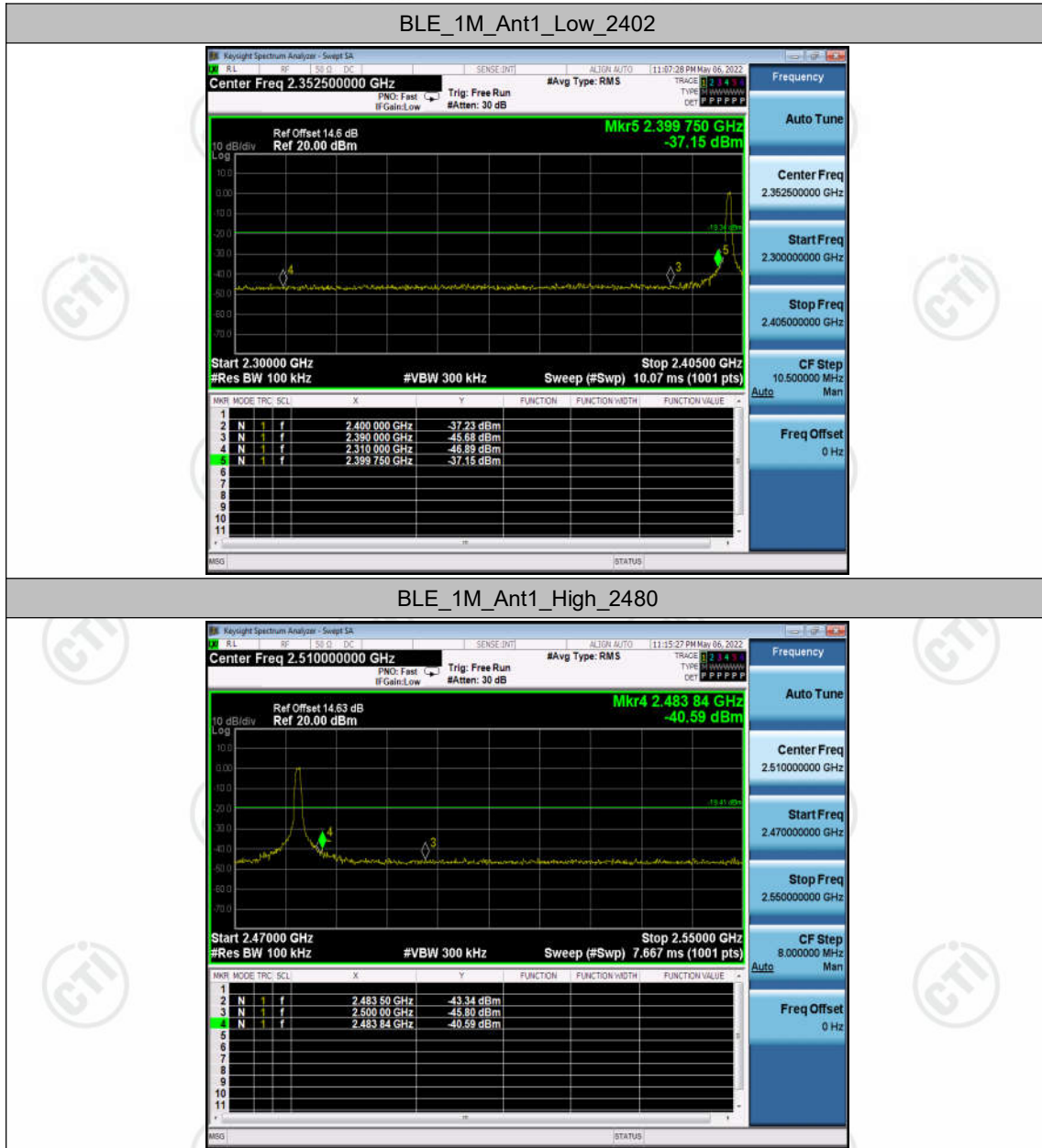
BLE_2M_Ant1_2480



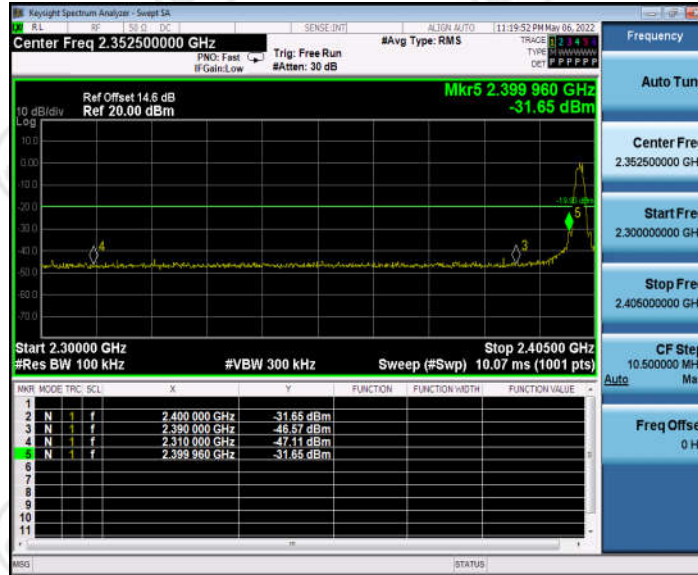
Appendix E: Band edge measurements**Test Result**

| Test Mode | Antenna | ChName | Frequency [MHz] | RefLevel [dBm] | Result [dBm] | Limit [dBm] | Verdict |
|-----------|---------|--------|-----------------|----------------|--------------|-------------|---------|
| BLE_1M | Ant1 | Low | 2402 | 0.66 | -37.15 | ≤-19.34 | PASS |
| | | High | 2480 | 0.59 | -40.59 | ≤-19.41 | PASS |
| BLE_2M | Ant1 | Low | 2402 | 0.07 | -31.65 | ≤-19.93 | PASS |
| | | High | 2480 | 0.06 | -40.69 | ≤-19.94 | PASS |

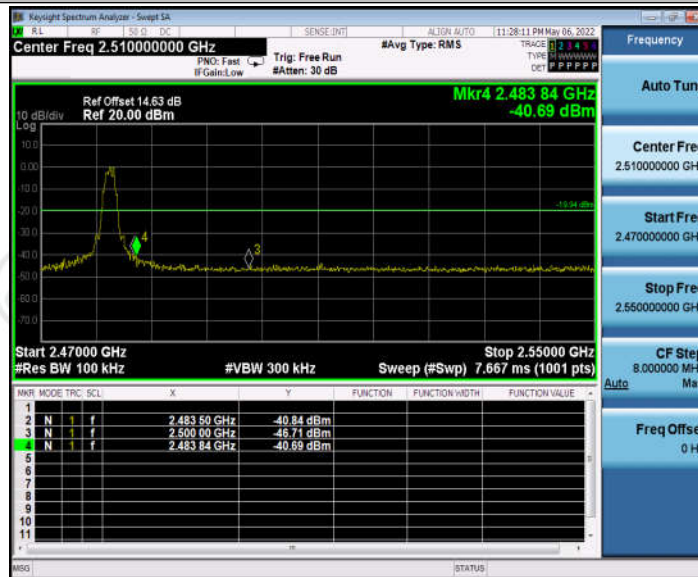
Test Graphs



BLE_2M_Ant1_Low_2402



BLE_2M_Ant1_High_2480

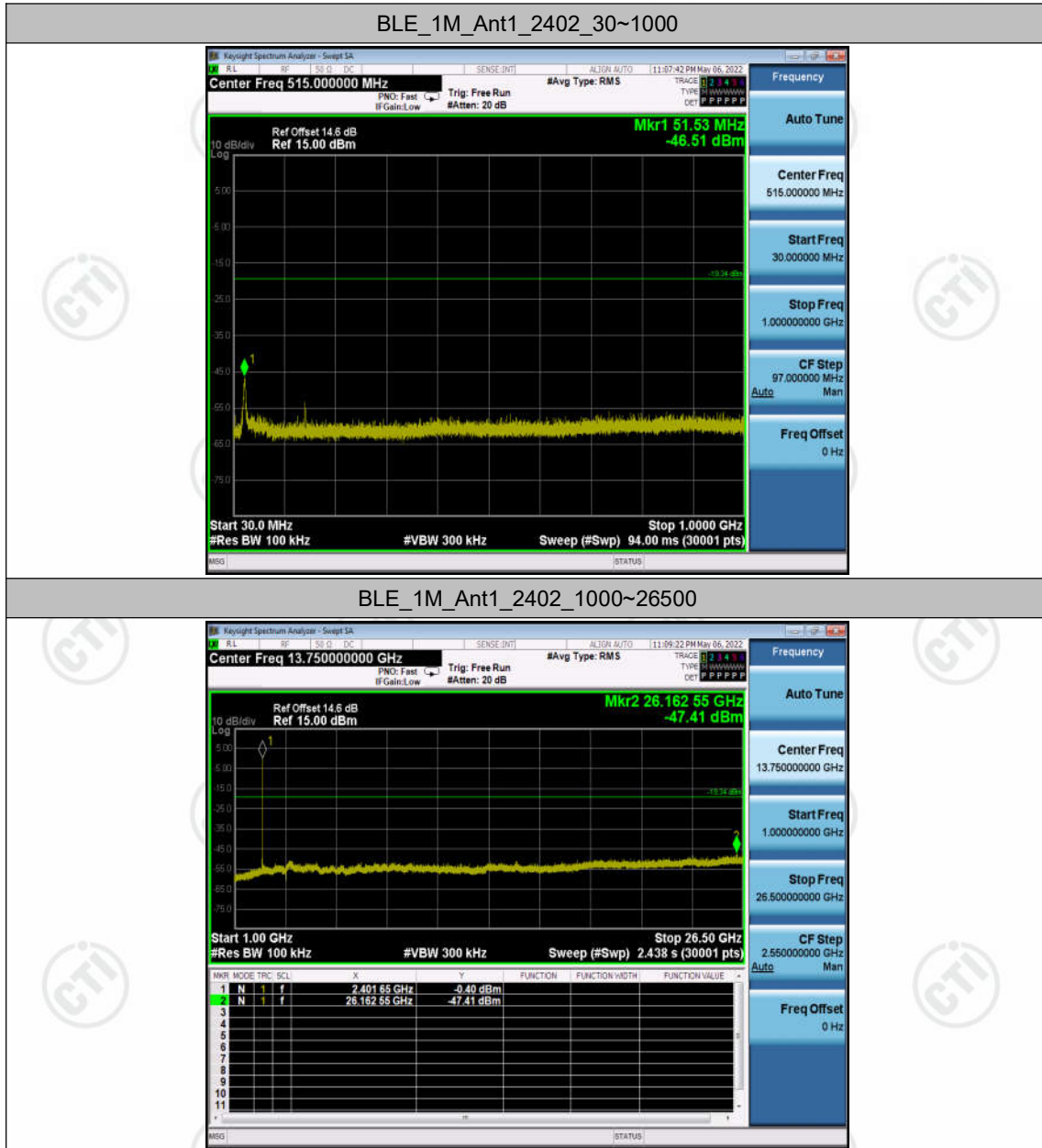


Appendix F: Conducted Spurious Emission

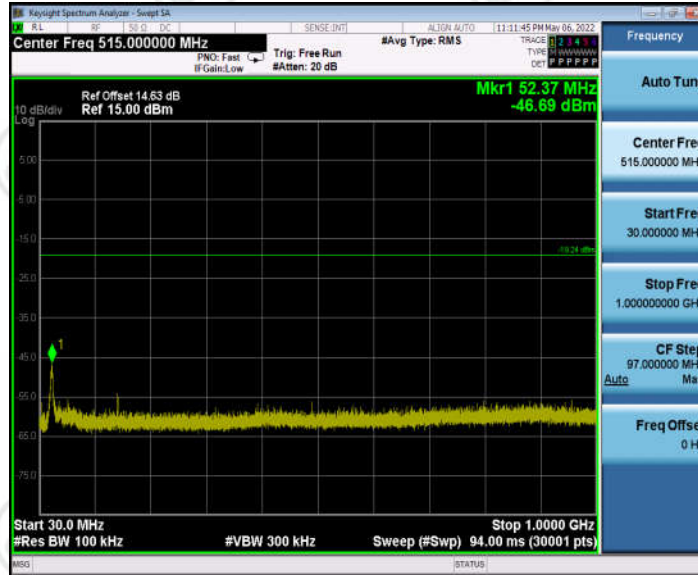
Test Result

| Test Mode | Antenna | Frequency [MHz] | FreqRange [MHz] | RefLevel [dBm] | Result[dBm] | Limit[dBm] | Verdict |
|-----------|---------|-----------------|-----------------|----------------|-------------|------------|---------|
| BLE_1M | Ant1 | 2402 | 30~1000 | 0.66 | -46.51 | ≤-19.34 | PASS |
| | | | 1000~26500 | 0.66 | -47.41 | ≤-19.34 | PASS |
| | | 2440 | 30~1000 | 0.76 | -46.69 | ≤-19.24 | PASS |
| | | | 1000~26500 | 0.76 | -48.32 | ≤-19.24 | PASS |
| | | 2480 | 30~1000 | 0.59 | -46.43 | ≤-19.41 | PASS |
| | | | 1000~26500 | 0.59 | -47.87 | ≤-19.41 | PASS |
| BLE_2M | Ant1 | 2402 | 30~1000 | 0.07 | -46.7 | ≤-19.93 | PASS |
| | | | 1000~26500 | 0.07 | -48.27 | ≤-19.93 | PASS |
| | | 2440 | 30~1000 | 0.17 | -46.43 | ≤-19.83 | PASS |
| | | | 1000~26500 | 0.17 | -48.48 | ≤-19.83 | PASS |
| | | 2480 | 30~1000 | 0.06 | -45.97 | ≤-19.94 | PASS |
| | | | 1000~26500 | 0.06 | -47.36 | ≤-19.94 | PASS |

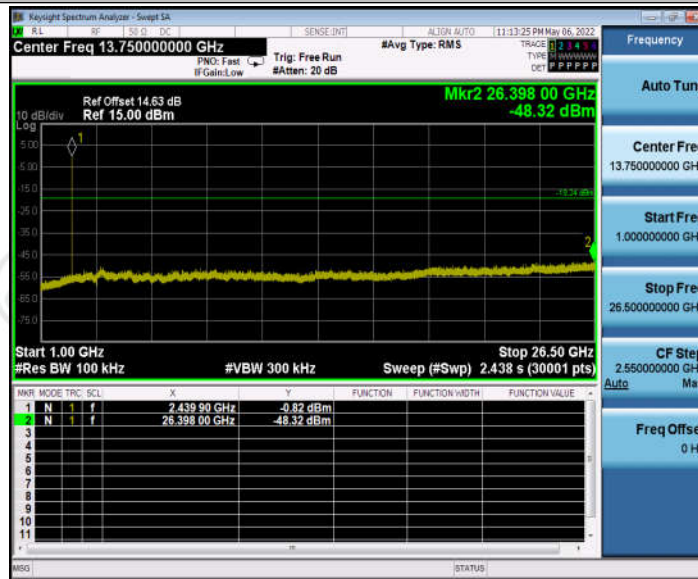
Test Graphs



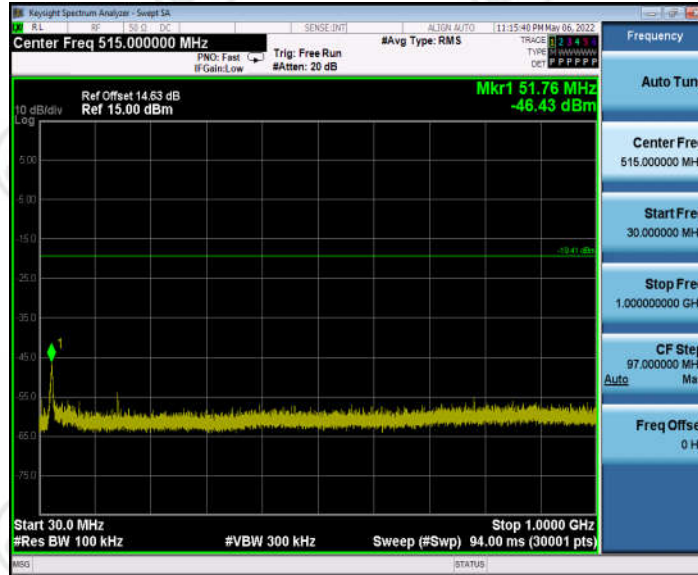
BLE_1M_Ant1_2440_30~1000



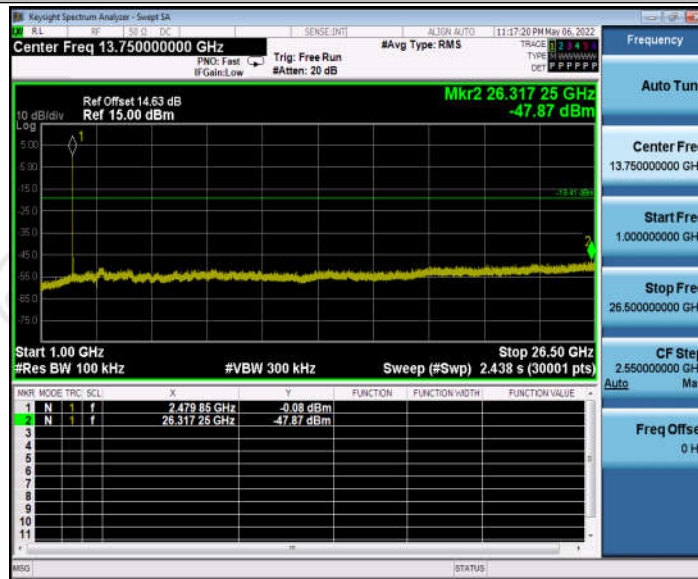
BLE_1M_Ant1_2440_1000~26500

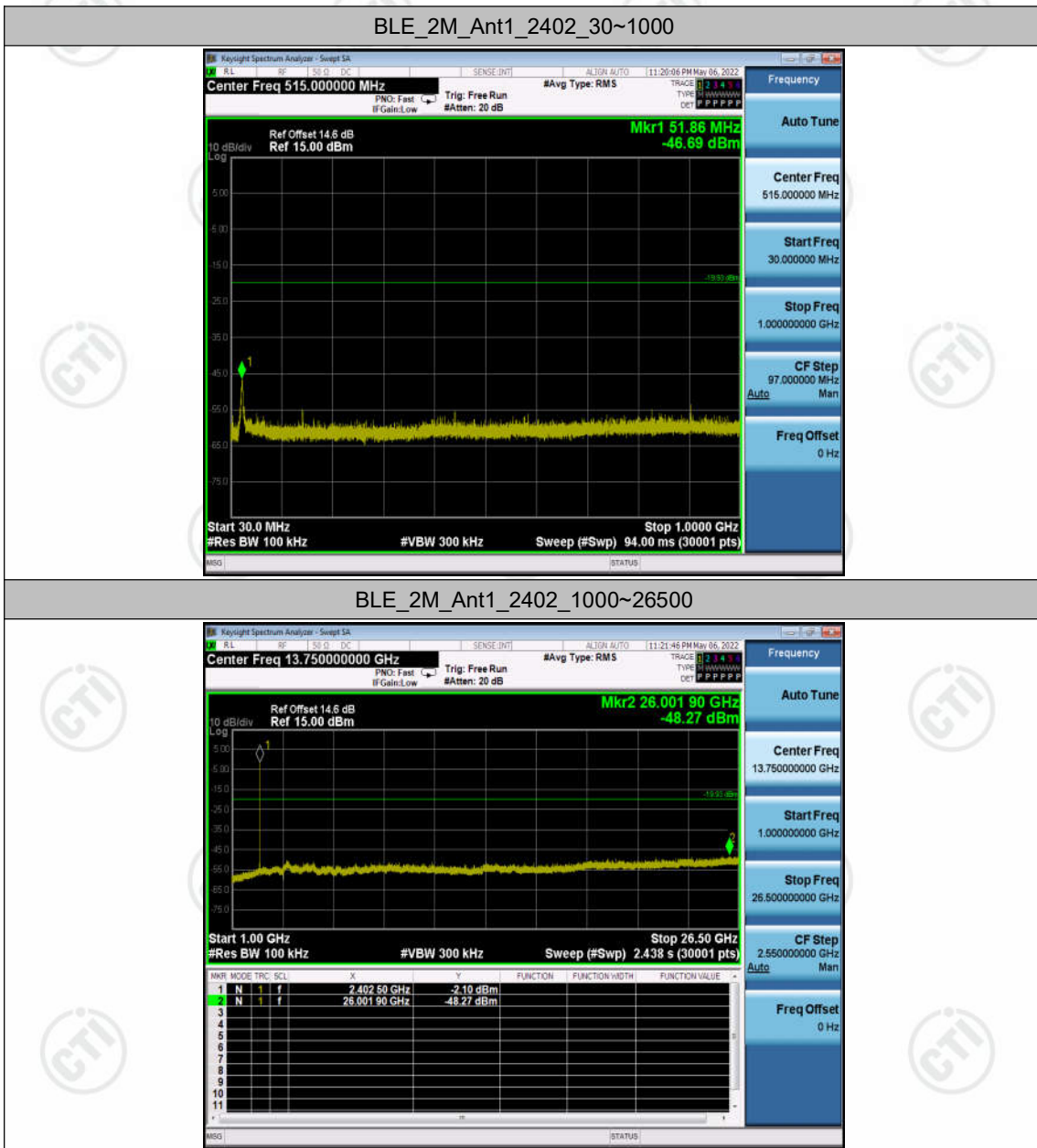


BLE_1M_Ant1_2480_30~1000

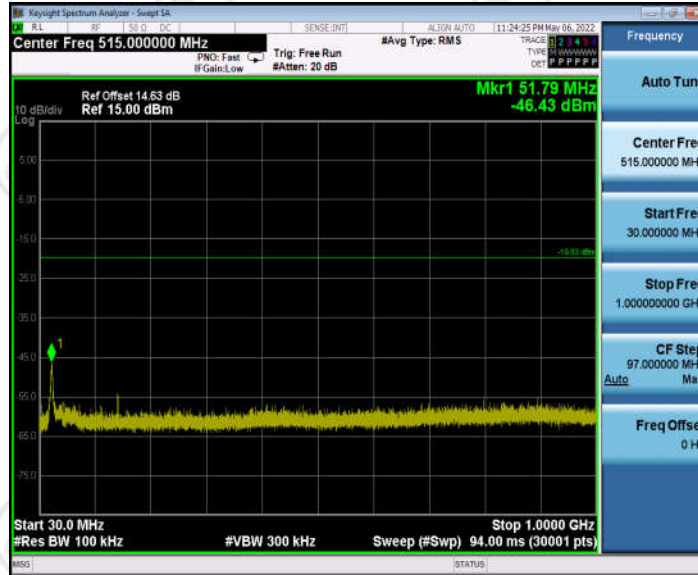


BLE_1M_Ant1_2480_1000~26500

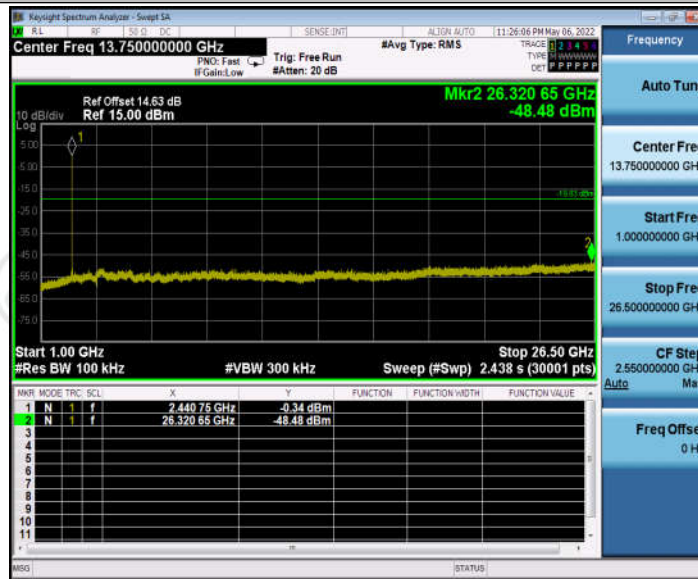




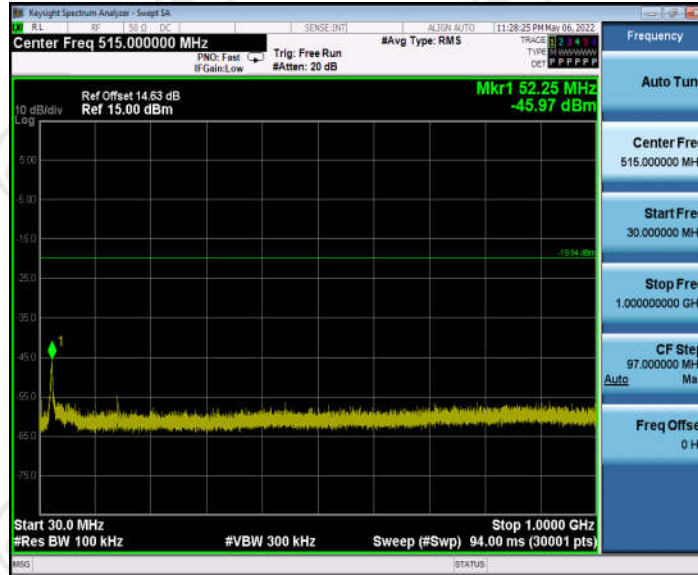
BLE_2M_Ant1_2440_30~1000



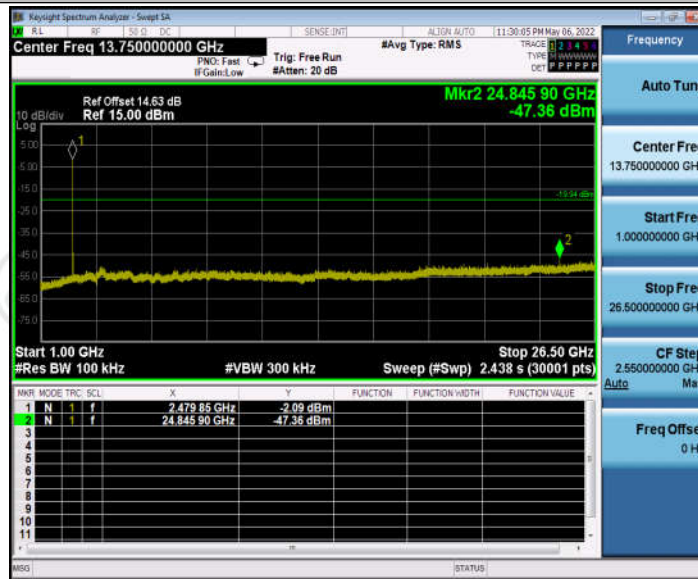
BLE_2M_Ant1_2440_1000~26500



BLE_2M_Ant1_2480_30~1000



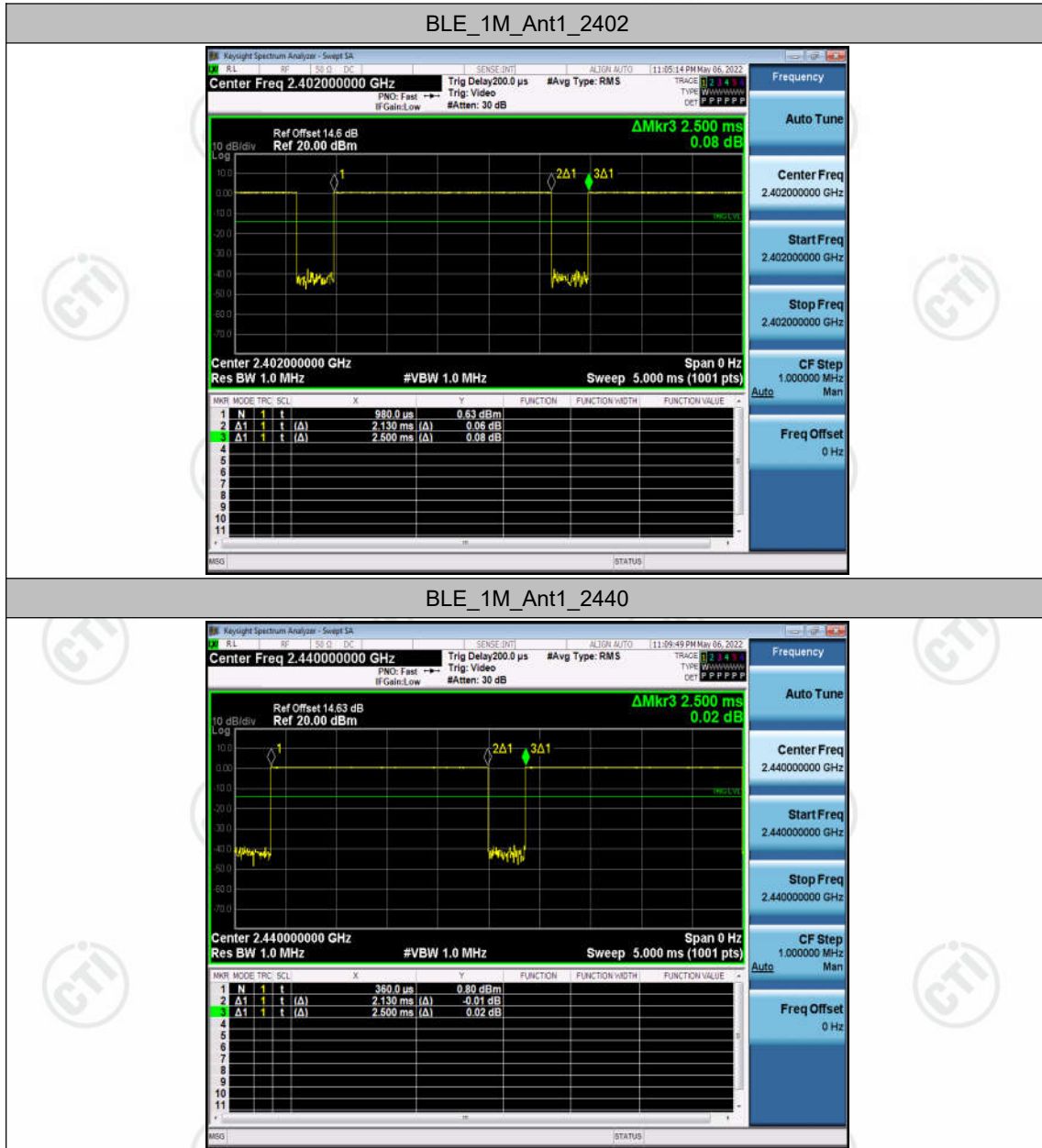
BLE_2M_Ant1_2480_1000~26500



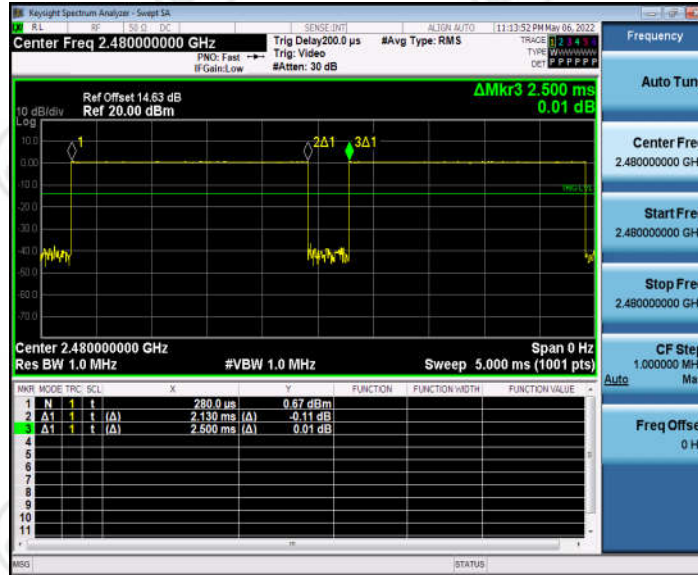
Appendix G: Duty Cycle**Test Result**

| Test Mode | Antenna | Frequency[MHz] | ON Time [ms] | Period [ms] | Duty Cycle [%] | Duty Cycle Factor[dB] |
|-----------|---------|----------------|--------------|-------------|----------------|-----------------------|
| BLE_1M | Ant1 | 2402 | 2.13 | 2.50 | 85.20 | 0.70 |
| | | 2440 | 2.13 | 2.50 | 85.20 | 0.70 |
| | | 2480 | 2.13 | 2.50 | 85.20 | 0.70 |
| BLE_2M | Ant1 | 2402 | 1.07 | 1.88 | 56.91 | 2.45 |
| | | 2440 | 1.07 | 1.88 | 56.91 | 2.45 |
| | | 2480 | 1.07 | 1.88 | 56.91 | 2.45 |

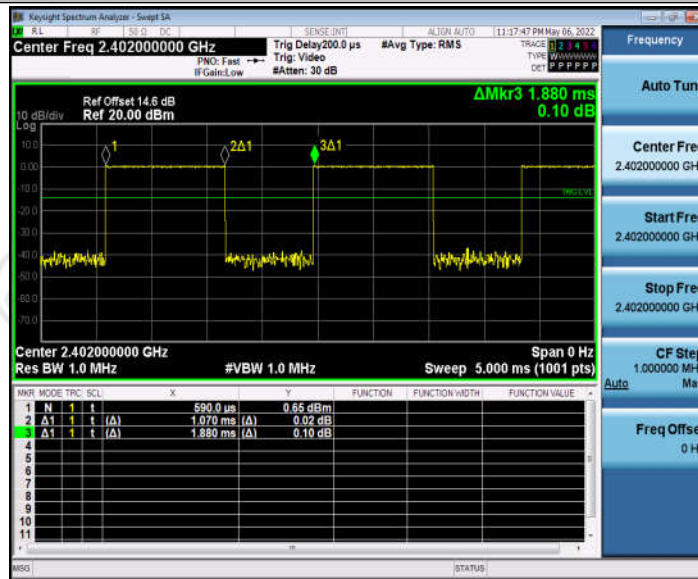
Test Graphs

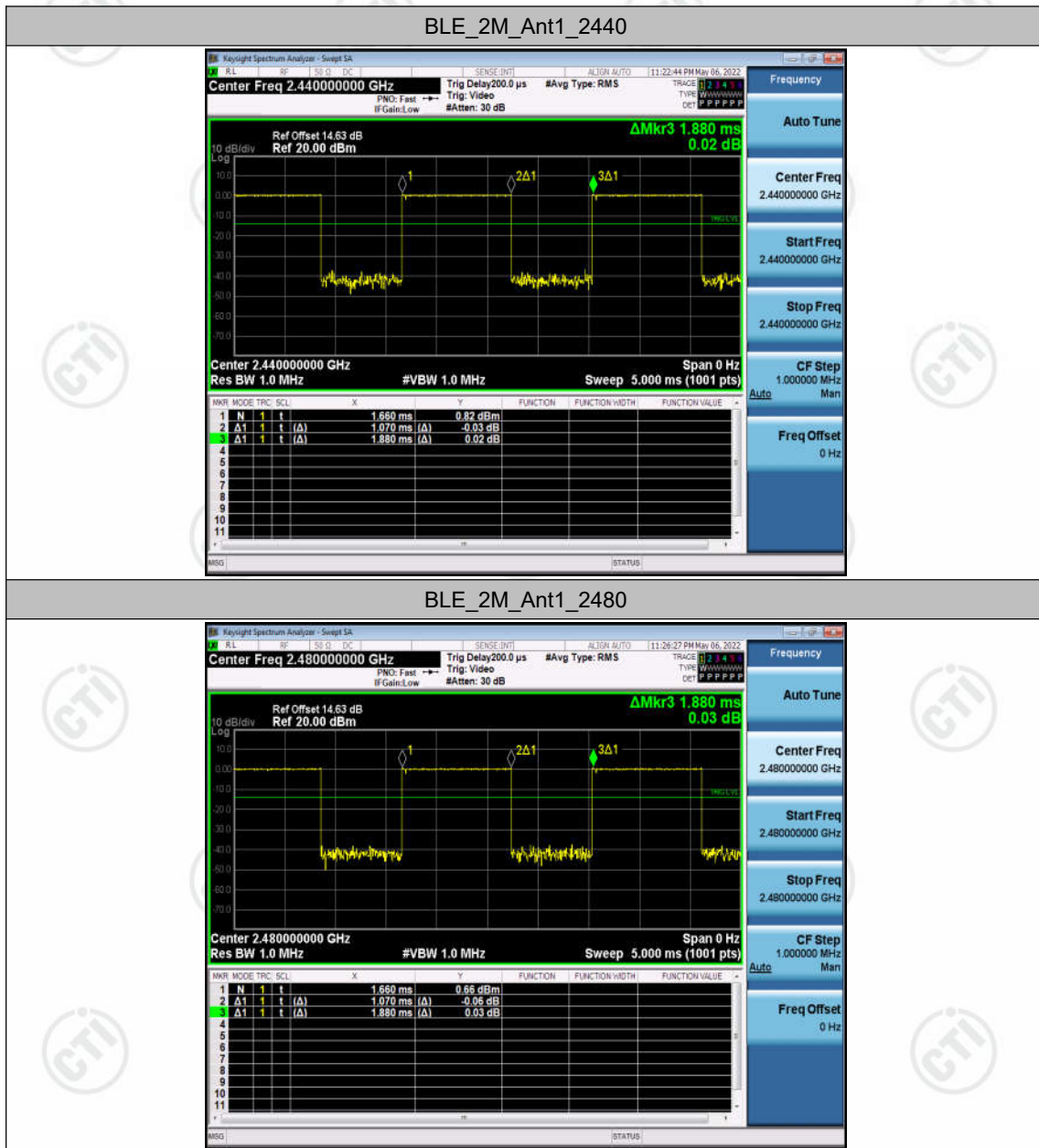


BLE_1M_Ant1_2480



BLE_2M_Ant1_2402





*** End of Report ***