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

**Product Name: Smart Ring**

**Trade Mark: N/A**

**Test Model: R01**

**FCC ID: 2AO47-R01**

# 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 |

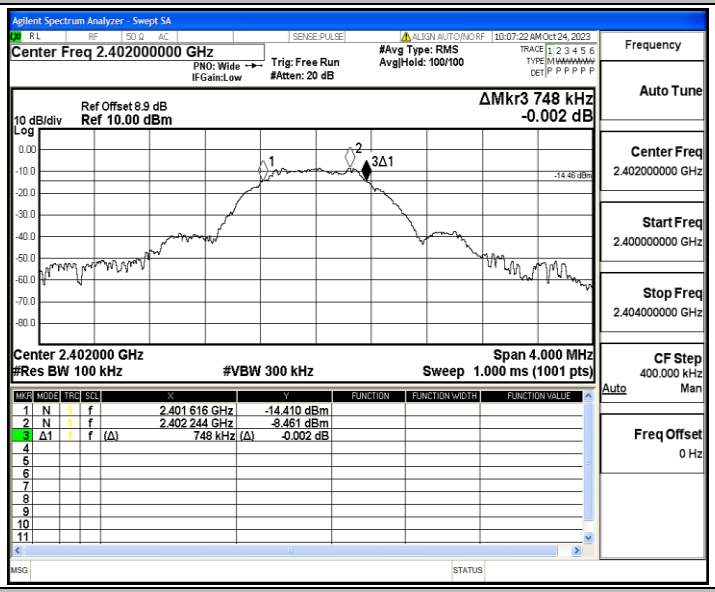
## Appendix A: DTS Bandwidth

### Test Result

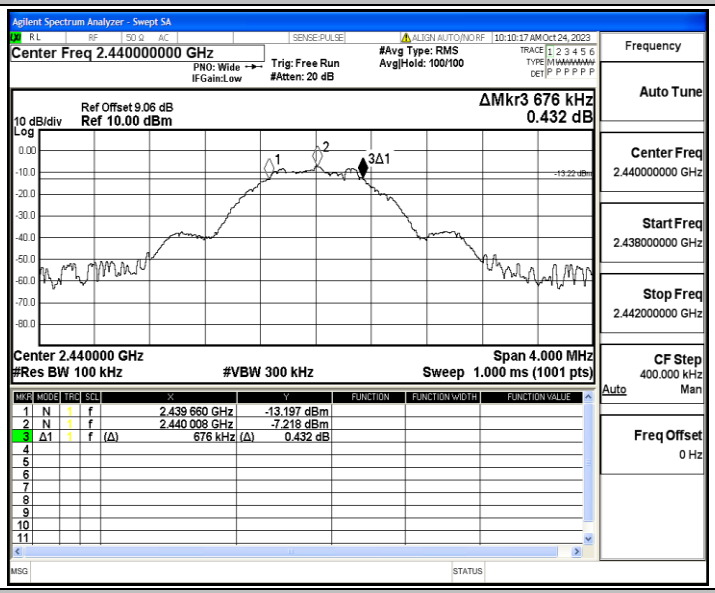
| TestMode | Antenna | Channel | DTS BW [MHz] | FL[MHz] | FH[MHz] | Limit[MHz] | Verdict |
|---|---|---|---|---|---|---|---|
| BLE_1M | Ant1 | 2402 | 0.748 | 2401.616 | 2402.364 | 0.5 | PASS |
| | | 2440 | 0.676 | 2439.660 | 2440.336 | 0.5 | PASS |
| | | 2480 | 0.684 | 2479.656 | 2480.340 | 0.5 | PASS |

## Test Graphs

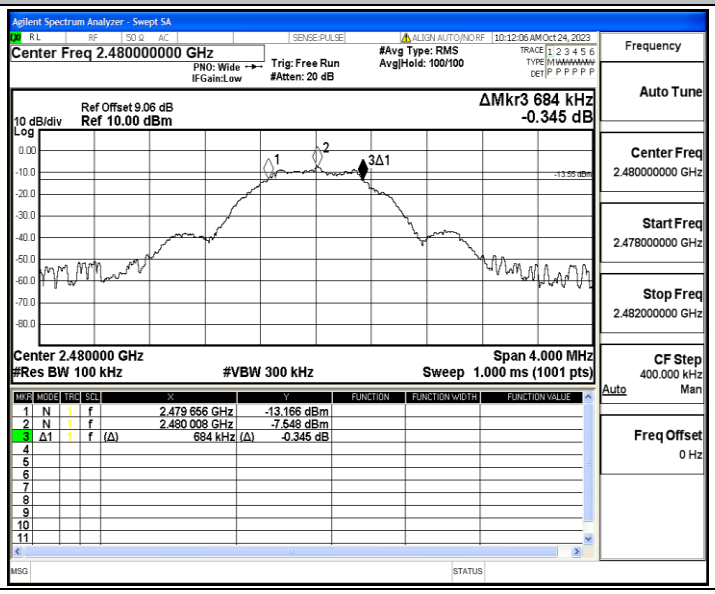
BLE_1M_Ant1_2402




BLE_1M_Ant1_2440




BLE_1M_Ant1_2480



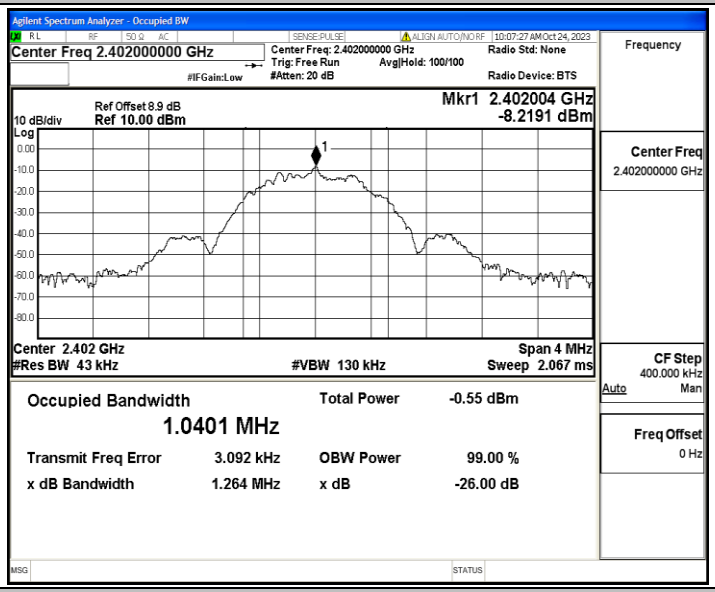
# Appendix B: Occupied Channel Bandwidth

## Test Result

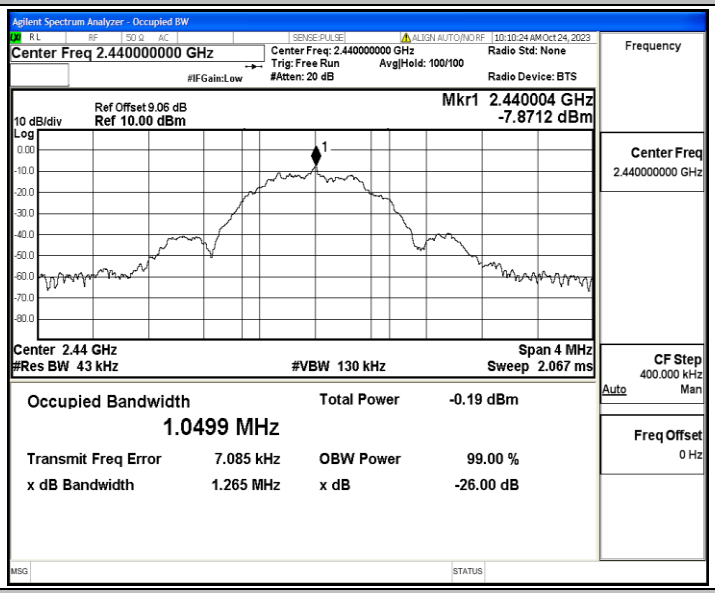
| TestMode | Antenna | Channel | OCB [MHz] | FL[MHz] | FH[MHz] | Limit[MHz] | Verdict |
|---|---|---|---|---|---|---|---|
| BLE_1M | Ant1 | 2402 | 1.0401 | 2401.4830 | 2402.5231 | --- | --- |
| | | 2440 | 1.0499 | 2439.4821 | 2440.5320 | --- | --- |
| | | 2480 | 1.0461 | 2479.4865 | 2480.5326 | --- | --- |

## Test Graphs

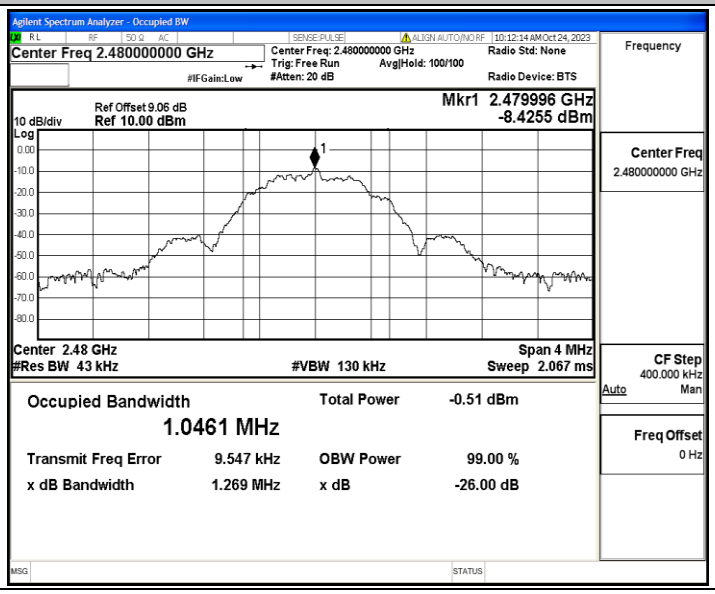
BLE_1M_Ant1_2402




BLE_1M_Ant1_2440




BLE_1M_Ant1_2480



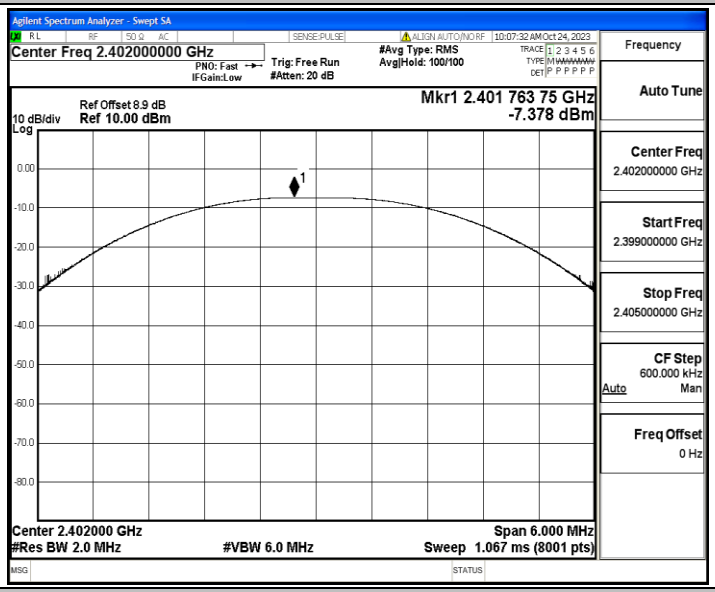
# Appendix C: Maximum Peak conducted output power

## Test Result

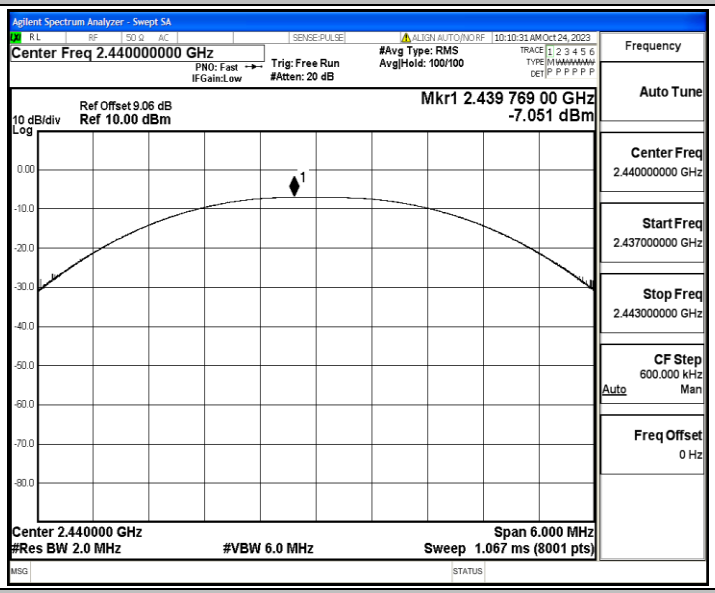
| TestMode | Antenna | Channel | Result[dBm] | Limit[dBm] | Verdict |
|---|---|---|---|---|---|
| BLE_1M | Ant1 | 2402 | -7.38 | ≤30 | PASS |
| | | 2440 | -7.05 | ≤30 | PASS |
| | | 2480 | -7.34 | ≤30 | PASS |

## Test Graphs

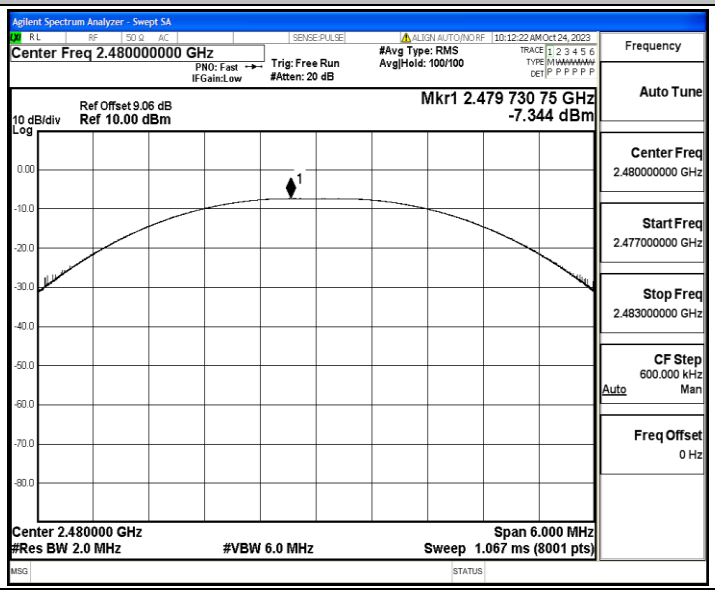
BLE_1M_Ant1_2402




BLE_1M_Ant1_2440




BLE_1M_Ant1_2480



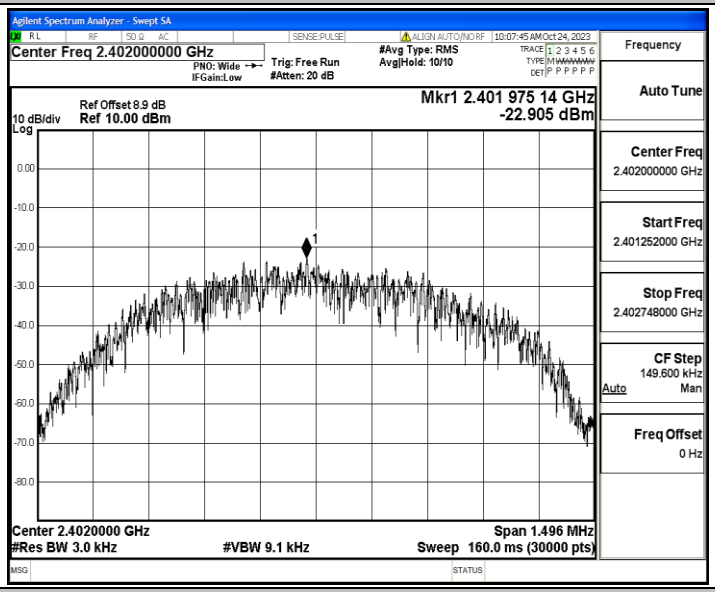
# Appendix D: Maximum power spectral density

## Test Result

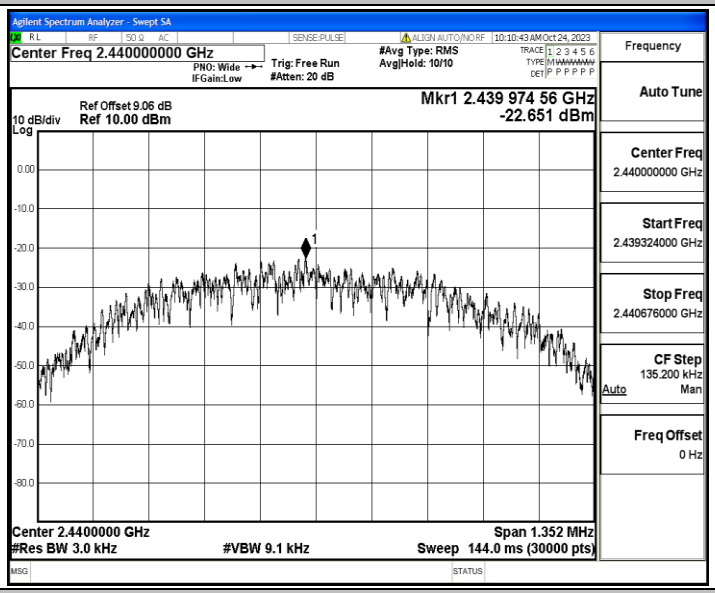
| TestMode | Antenna | Channel | Result[dBm/3-100kHz] | Limit[dBm/3kHz] | Verdict |
|---|---|---|---|---|---|
| BLE_1M | Ant1 | 2402 | -22.91 | ≤8.00 | PASS |
| | | 2440 | -22.65 | ≤8.00 | PASS |
| | | 2480 | -23.11 | ≤8.00 | PASS |

## Test Graphs

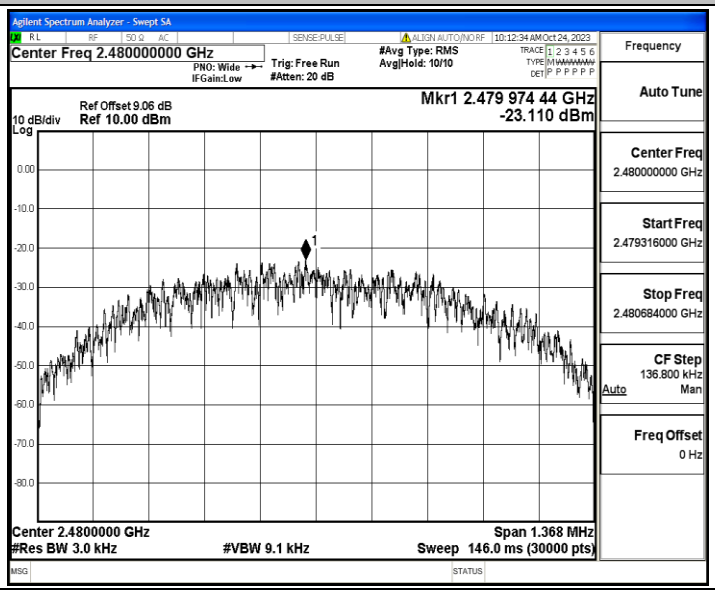
BLE_1M_Ant1_2402




BLE_1M_Ant1_2440




BLE_1M_Ant1_2480



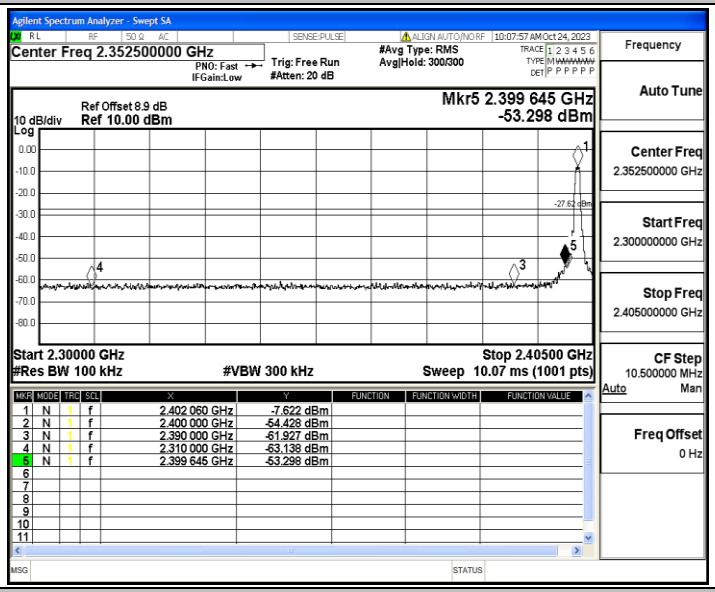
# Appendix E: Band edge measurements

## Test Result

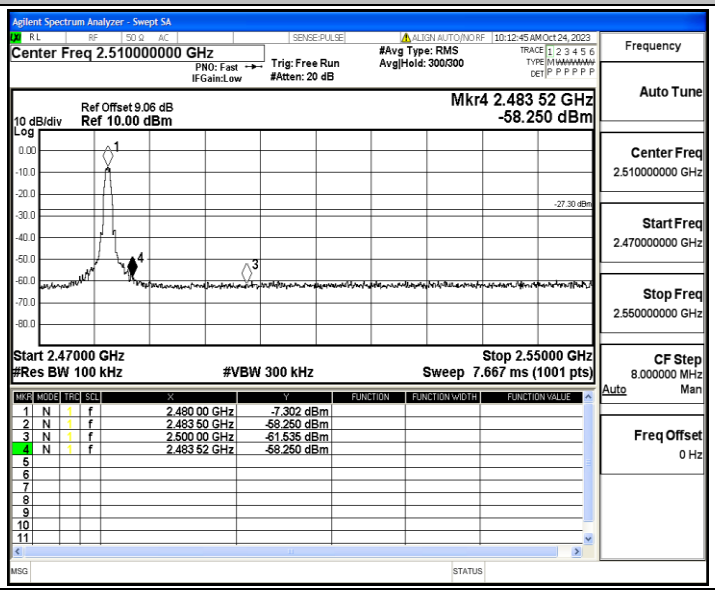
| TestMode | Antenna | ChName | Channel | RefLevel[dBm] | Result[dBm] | Limit[dBm] | Verdict |
|---|---|---|---|---|---|---|---|
| BLE_1M | Ant1 | Low | 2402 | -7.62 | -53.3 | ≤-27.62 | PASS |
| | | High | 2480 | -7.30 | -58.25 | ≤-27.3 | PASS |

## Test Graphs

BLE_1M_Ant1_Low_2402




BLE_1M_Ant1_High_2480



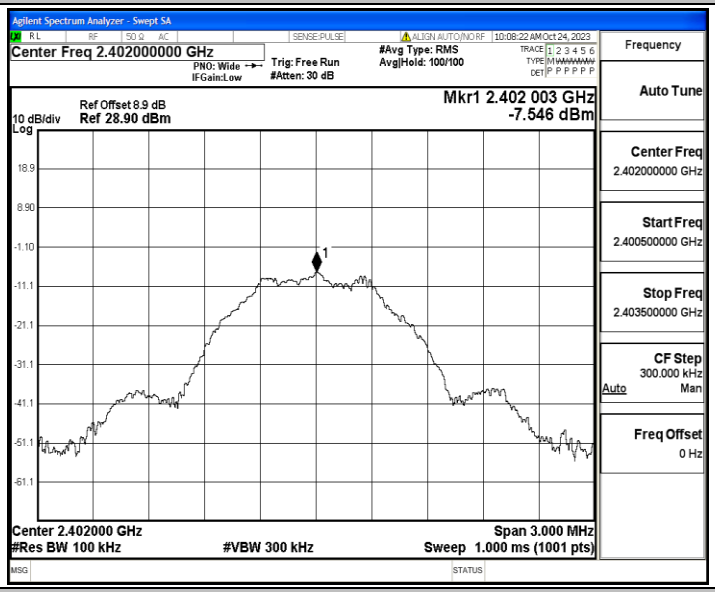
# Appendix F: Conducted Spurious Emission

## Test Result

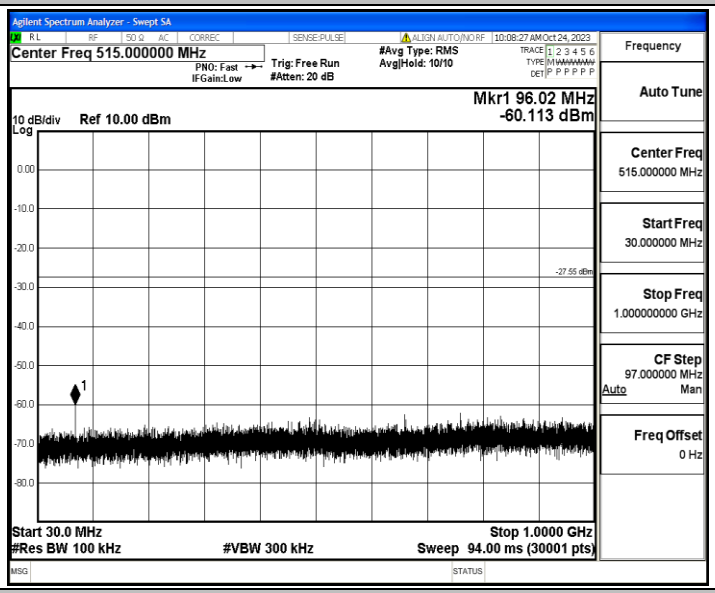
| TestMode | Antenna | Channel | FreqRange [MHz] | RefLevel [dBm] | Result[dBm] | Limit[dBm] | Verdict |
|---|---|---|---|---|---|---|---|
| BLE_1M | Ant1 | 2402 | Reference | -7.55 | -7.55 | --- | PASS |
| | | | 30~1000 | -7.55 | -60.11 | ≤-27.55 | PASS |
| | | | 1000~26500 | -7.55 | -48.32 | ≤-27.55 | PASS |
| | | 2440 | Reference | -7.22 | -7.22 | --- | PASS |
| | | | 30~1000 | -7.22 | -60.46 | ≤-27.22 | PASS |
| | | | 1000~26500 | -7.22 | -50.22 | ≤-27.22 | PASS |
| | | 2480 | Reference | -7.47 | -7.47 | --- | PASS |
| | | | 30~1000 | -7.47 | -59.76 | ≤-27.47 | PASS |
| | | | 1000~26500 | -7.47 | -49.36 | ≤-27.47 | PASS |

## Test Graphs

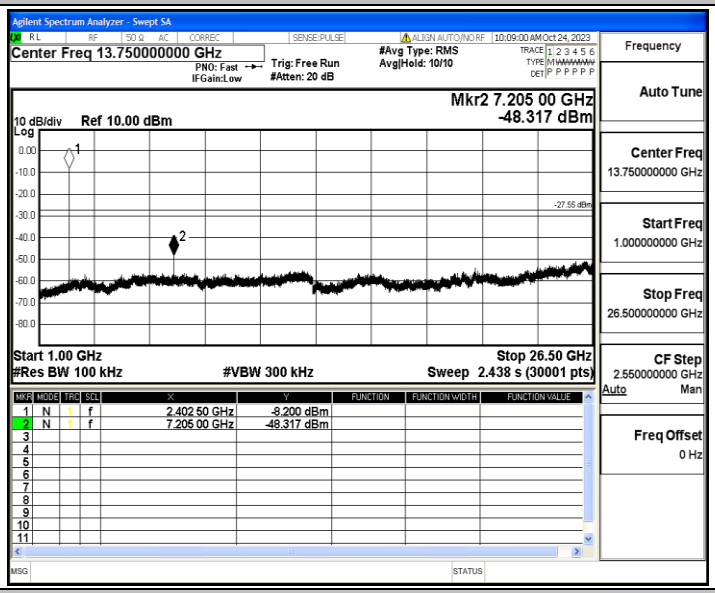
BLE_1M_Ant1_2402_0~Reference



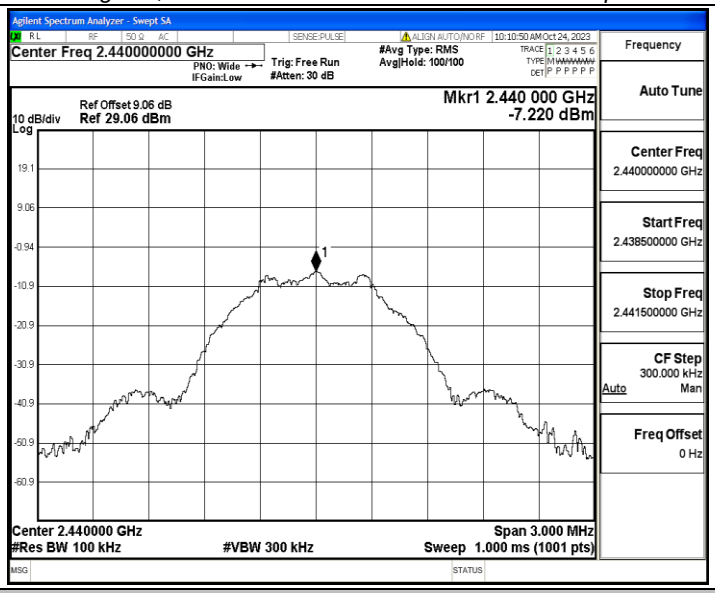

BLE_1M_Ant1_2402_30~1000



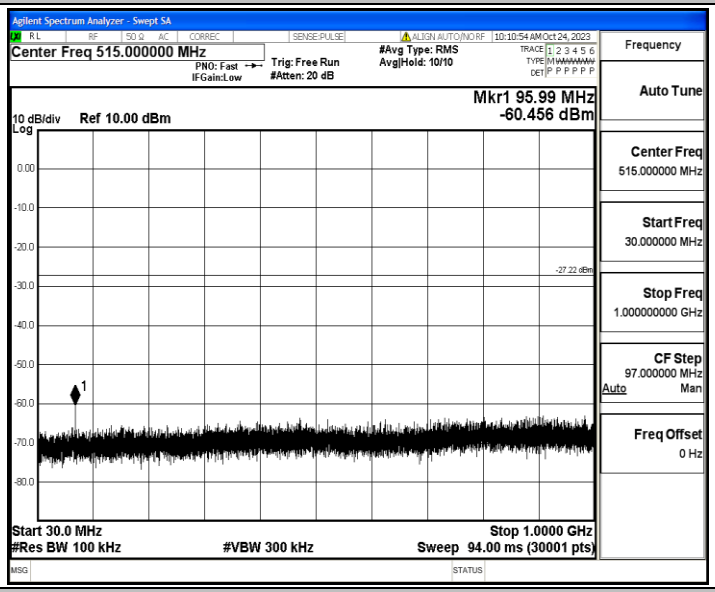

BLE_1M_Ant1_2402_1000~26500



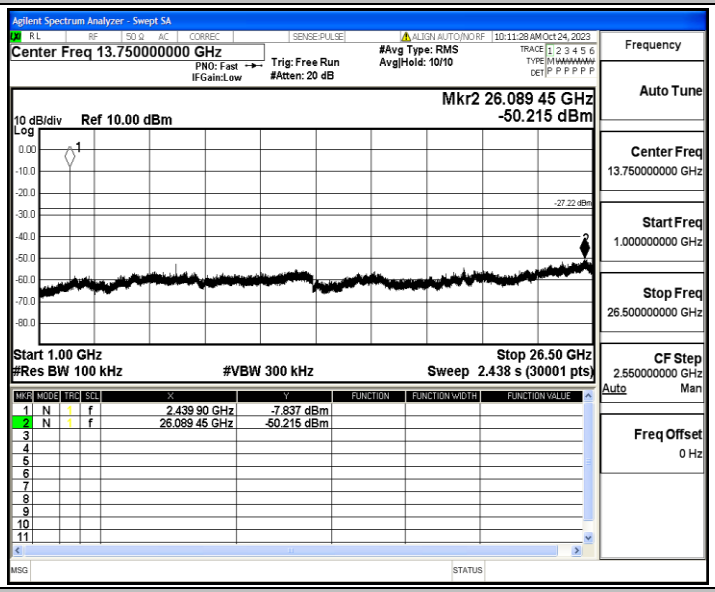

BLE_1M_Ant1_2440_0~Reference



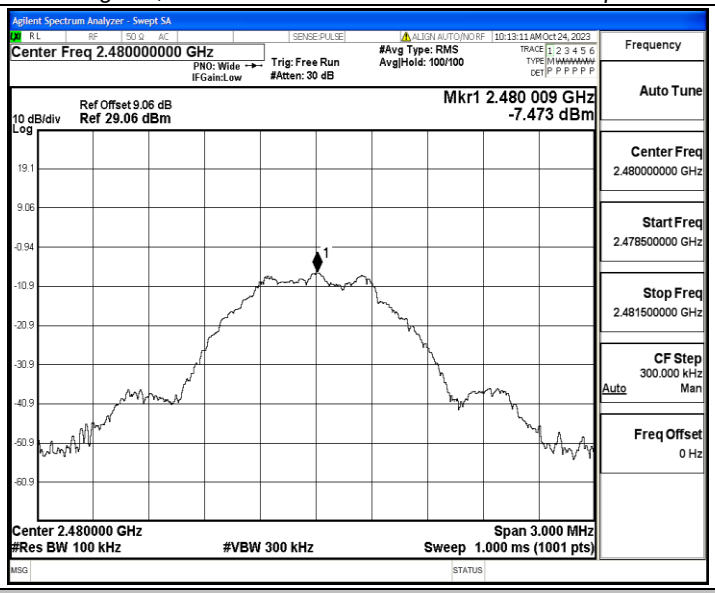

BLE_1M_Ant1_2440_30~1000



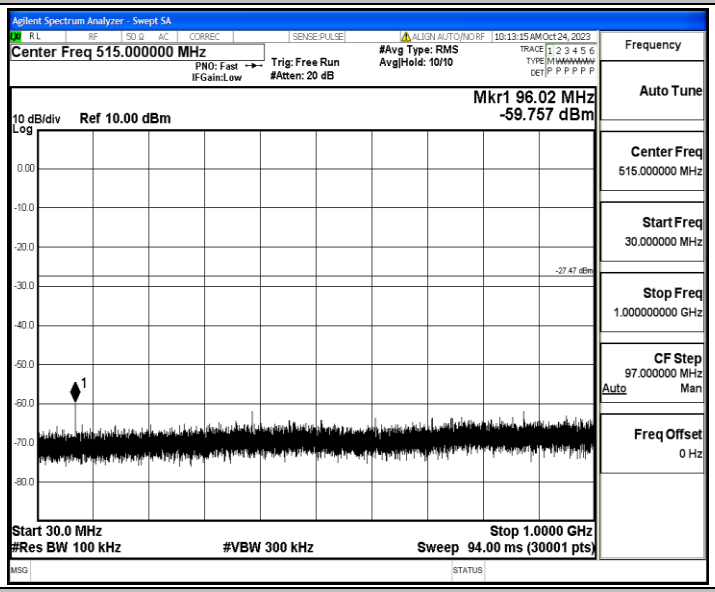

BLE_1M_Ant1_2440_1000~26500



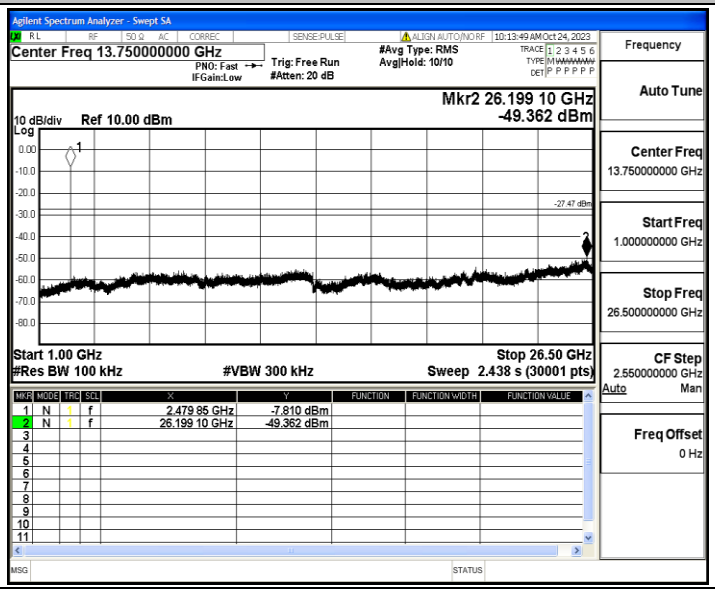

BLE_1M_Ant1_2480_0~Reference




BLE_1M_Ant1_2480_30~1000




BLE_1M_Ant1_2480_1000~26500



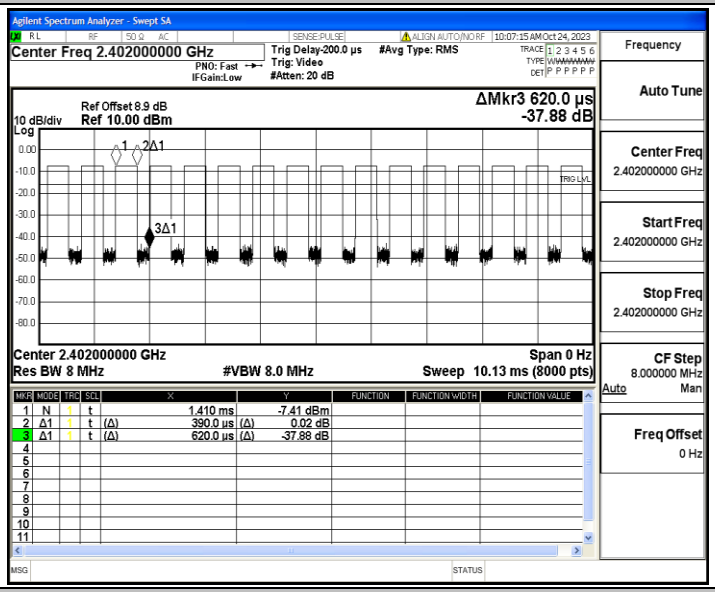
# Appendix G: Duty Cycle

## Test Result

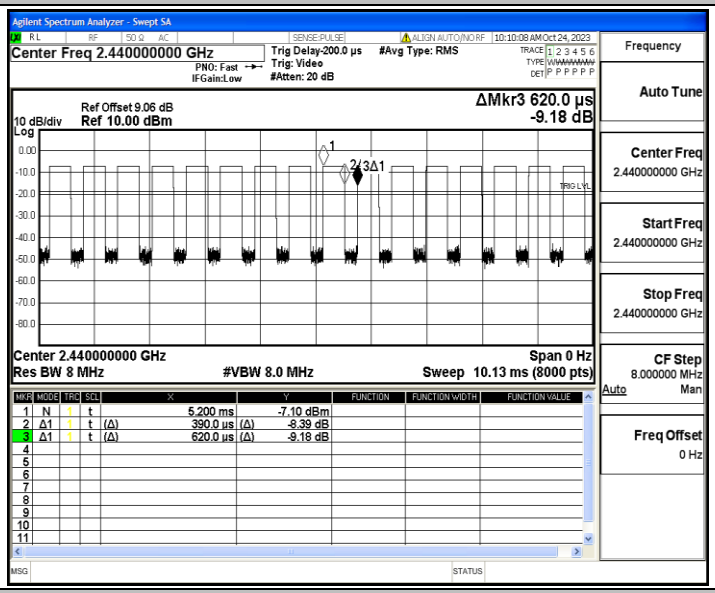
| TestMode | Antenna | Channel | Transmission Duration [ms] | Transmission Period [ms] | Duty Cycle [%] | 1/T[kHz] |
|---|---|---|---|---|---|---|
| BLE_1M | Ant1 | 2402 | 0.39 | 0.62 | 62.90 | 2.56 |
| | | 2440 | 0.39 | 0.62 | 62.90 | 2.56 |
| | | 2480 | 0.39 | 0.62 | 62.90 | 2.56 |

## Test Graphs

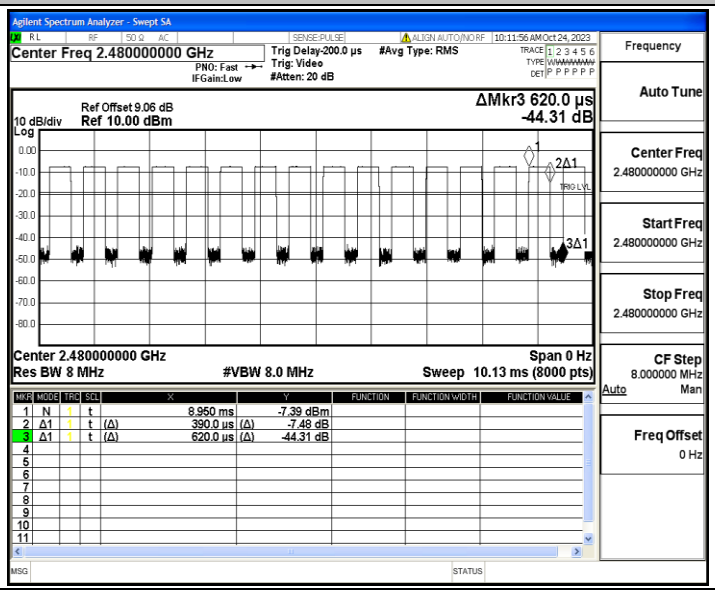
BLE_1M_Ant1_2402




BLE_1M_Ant1_2440




BLE_1M_Ant1_2480



# Appendix H: Emissions in Restricted Bands

## Test Result

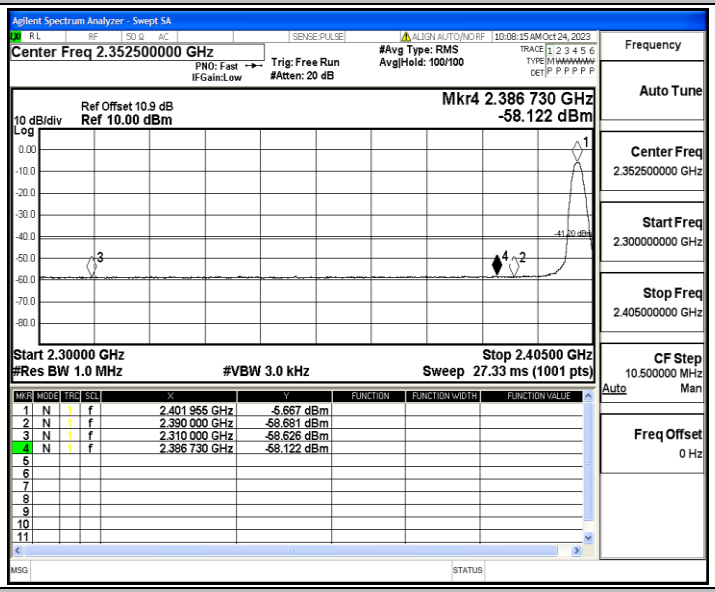
| TestMode | Antenna | ChName | Channel | Detector | Freq. [MHz] | Result [dBm] | Limit [dBm] | Verdict |
|---|---|---|---|---|---|---|---|---|
| BLE_1M | Ant1 | Low | 2402 | AV | 2310.000 | -58.63 | ≤-41.20 | PASS |
| | | | | AV | 2386.730 | -58.12 | ≤-41.20 | PASS |
| | | | | AV | 2390.000 | -58.68 | ≤-41.20 | PASS |
| | | | | Peak | 2310.000 | -52.43 | ≤-21.20 | PASS |
| | | | | Peak | 2383.265 | -49.48 | ≤-21.20 | PASS |
| | | | | Peak | 2390.000 | -51.13 | ≤-21.20 | PASS |
| | | High | 2480 | AV | 2483.500 | -54.67 | ≤-41.20 | PASS |
| | | | | AV | 2483.520 | -54.67 | ≤-41.20 | PASS |
| | | | | AV | 2500.000 | -58.05 | ≤-41.20 | PASS |
| | | | | Peak | 2483.500 | -48.71 | ≤-21.20 | PASS |
| | | | | Peak | 2484.560 | -43.05 | ≤-21.20 | PASS |
| | | | | Peak | 2500.000 | -51.34 | ≤-21.20 | PASS |

Note：

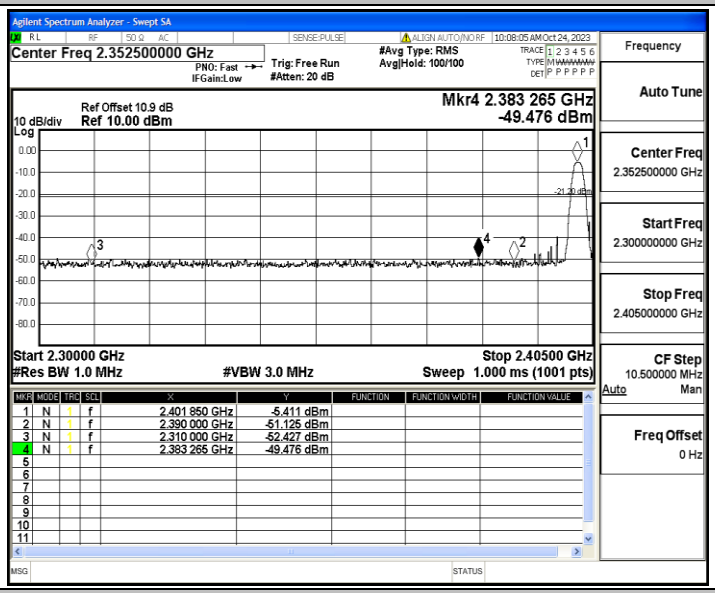
1. The Antenna Gain is compensated in the graph with 2dBi and Antenna Gain which is Higher.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

## Test Graphs

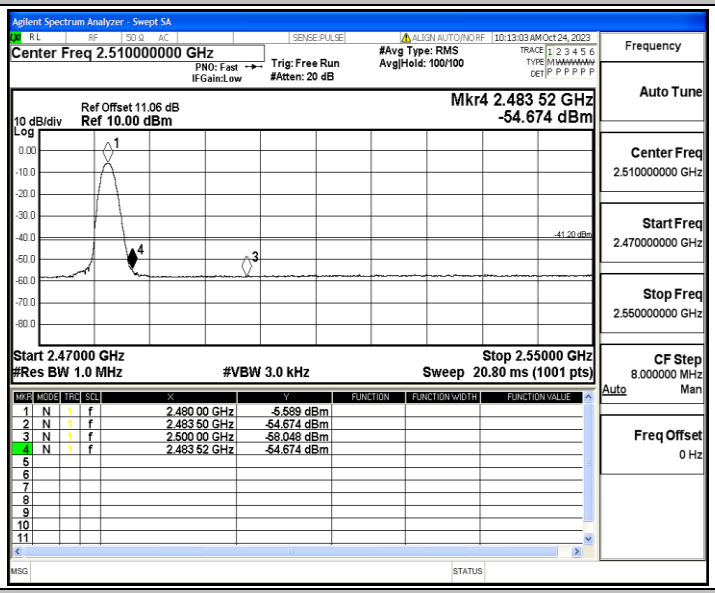
BLE_1M_Ant1_Low_2402_AV



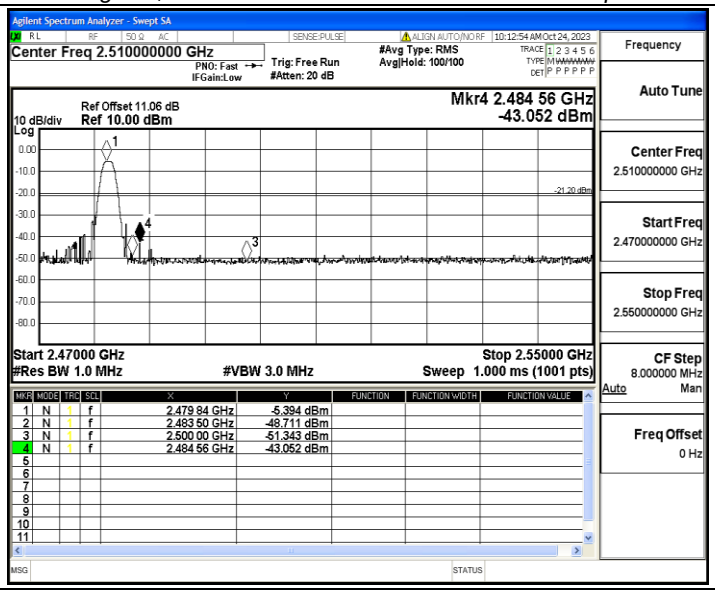

BLE_1M_Ant1_Low_2402_Peak




BLE_1M_Ant1_High_2480_AV




BLE_1M_Ant1_High_2480_Peak


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.510000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
Avg|Hold: 100/100
10:12:54 AM Oct 24, 2023
Ref Offset 11.06 dB
10 dB/div
Ref 10.00 dBm
Log
Mkr4 2.484 56 GHz
-43.052 dBm
-21.20 dBm
Start 2.47000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Stop 2.55000 GHz
Sweep 1.000 ms (1001 pts)
1 N 1 f 2.479 84 GHz -5.394 dBm
2 N 1 f 2.483 50 GHz -48.711 dBm
3 N 1 f 2.500 00 GHz -51.343 dBm
4 N 1 f 2.484 56 GHz -43.052 dBm
Frequency
Auto Tune
Center Freq
2.510000000 GHz
Start Freq
2.470000000 GHz
Stop Freq
2.550000000 GHz
CF Step
8.000000 MHz
Auto
Man
Freq Offset
0 Hz