# Appendix Test Data

| | | | |
|---|---|---|---|
| Report No.: | 18220WC30249002 | Test Sample No.: | 1-2-2 |
| Start Test Date: | 2023.12.02 | Finish Test Date: | 2023.12.04 |
| Test Engineer: | Hayman Chen | Auditor: | Rock Luo |
| Temperature: | 25.7℃ | Relative Humidity: | 44% |
| Pressure: | 101kPa | | |

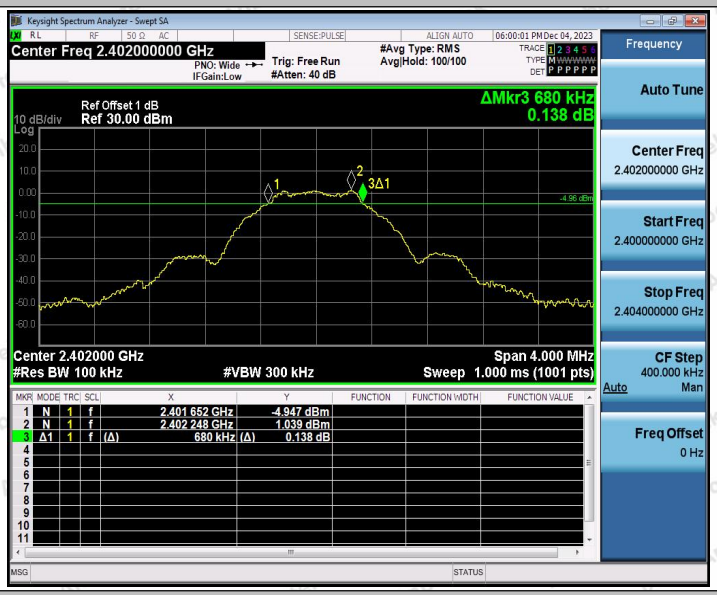
## Appendix A: DTS Bandwidth

### Test Result

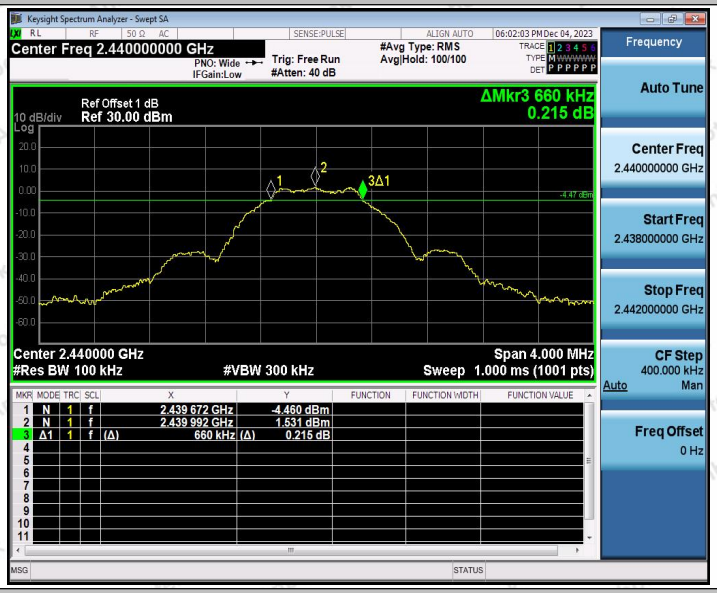
| TestMode | Antenna | Frequency[MHz] | DTS BW [MHz] | FL[MHz] | FH[MHz] | Limit[MHz] | Verdict |
|---|---|---|---|---|---|---|---|
| BLE_1M | Ant1 | 2402 | 0.680 | 2401.652 | 2402.332 | 0.5 | PASS |
| | | 2440 | 0.660 | 2439.672 | 2440.332 | 0.5 | PASS |
| | | 2480 | 0.704 | 2479.640 | 2480.344 | 0.5 | PASS |

## Test Graphs

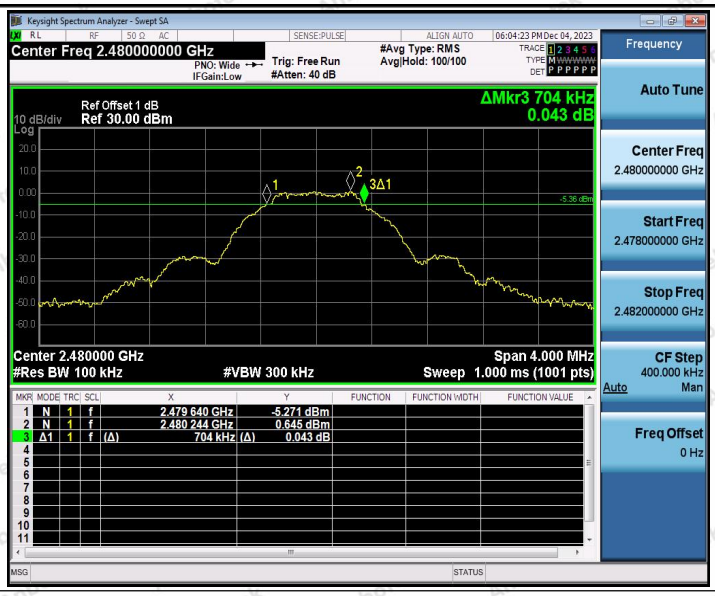
BLE_1M_Ant1_2402




BLE_1M_Ant1_2440




BLE_1M_Ant1_2480


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold: 100/100
06:04:23 PM Dec 04, 2023
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
ΔMkr3 704 kHz
0.043 dB
-5.36 dBm
Center 2.480000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 4.000 MHz
Sweep 1.000 ms (1001 pts)
1 N 1 f 2.479 640 GHz -5.271 dBm
2 N 1 f 2.480 244 GHz 0.645 dBm
3 Δ1 1 f (Δ) 704 kHz (Δ) 0.043 dB
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.478000000 GHz
Stop Freq
2.482000000 GHz
CF Step
400.000 kHz
Auto Man
Freq Offset
0 Hz

# Appendix B: Occupied Channel Bandwidth

## Test Result

| TestMode | Antenna | Frequency[MHz] | OCB [MHz] | FL[MHz] | FH[MHz] |
|---|---|---|---|---|---|
| BLE_1M | Ant1 | 2402 | 1.0316 | 2401.4925 | 2402.5241 |
| | | 2440 | 1.0281 | 2439.4948 | 2440.5229 |
| | | 2480 | 1.0267 | 2479.4934 | 2480.5201 |

## Test Graphs

BLE_1M_Ant1_2402

BLE_1M_Ant1_2440

BLE_1M_Ant1_2480

Keysight Spectrum Analyzer - Occupied BW
Center Freq 2.480000000 GHz
Center Freq: 2.480000000 GHz
Trig: Free Run
Avg|Hold: 100/100
#Atten: 40 dB
Radio Std: None
Radio Device: BTS
Frequency
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
Log
Mkr1 2.479968 GHz
-1.5874 dBm
Center 2.48 GHz
#Res BW 43 kHz
#VBW 130 kHz
Span 4 MHz
Sweep 2.067 ms
Occupied Bandwidth
1.0267 MHz
Total Power 8.01 dBm
Transmit Freq Error 6.773 kHz
OBW Power 99.00 %
x dB Bandwidth 1.260 MHz
x dB -26.00 dB
Center Freq
2.480000000 GHz
CF Step
400.000 kHz
Auto Man
Freq Offset
0 Hz

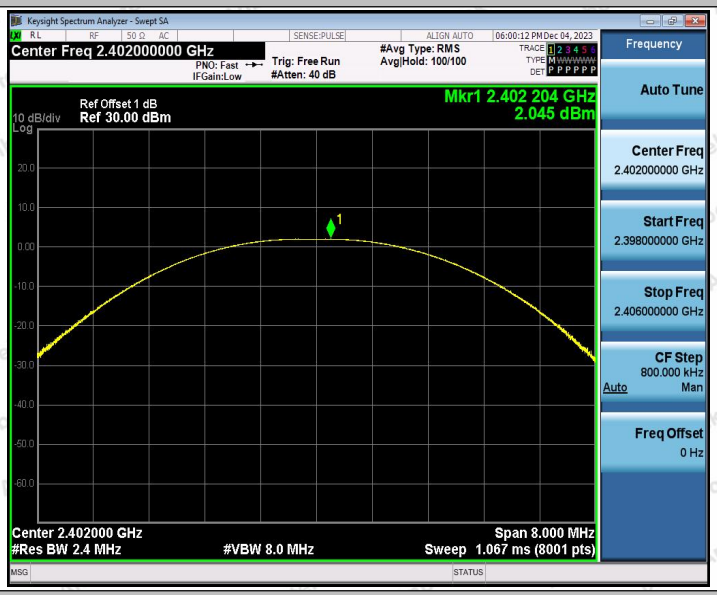
# Appendix C: Maximum conducted output power

## Test Result Peak

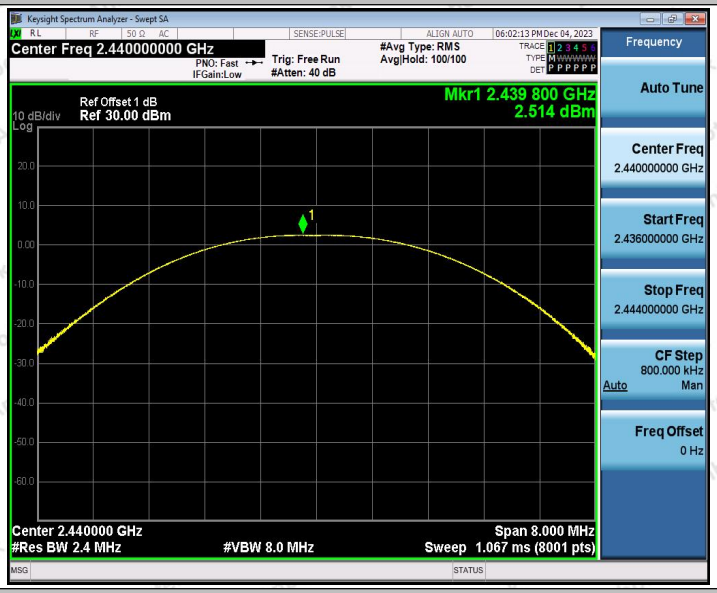
| TestMode | Antenna | Frequency[MHz] | Conducted Peak Power[dBm] | Conducted Limit[dBm] | Verdict |
|---|---|---|---|---|---|
| BLE_1M | Ant1 | 2402 | 2.05 | ≤30 | PASS |
| | | 2440 | 2.51 | ≤30 | PASS |
| | | 2480 | 1.66 | ≤30 | PASS |

## Test Graphs Peak

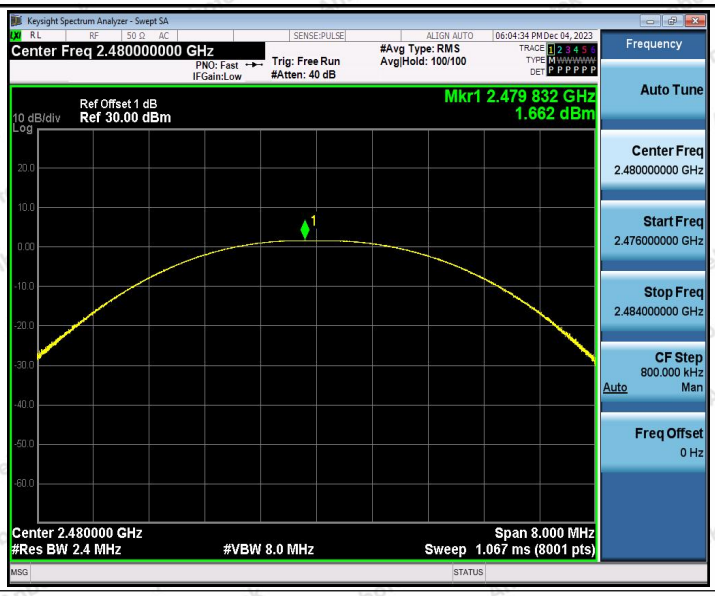
BLE_1M_Ant1_2402




BLE_1M_Ant1_2440




BLE_1M_Ant1_2480


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 40 dB
#Avg Type: RMS
Avg|Hold: 100/100
06:04:34 PM Dec 04, 2023
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
Log
Mkr1 2.479 832 GHz
1.662 dBm
Center 2.480000 GHz
#Res BW 2.4 MHz
#VBW 8.0 MHz
Span 8.000 MHz
Sweep 1.067 ms (8001 pts)
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.476000000 GHz
Stop Freq
2.484000000 GHz
CF Step
800.000 kHz
Auto
Man
Freq Offset
0 Hz

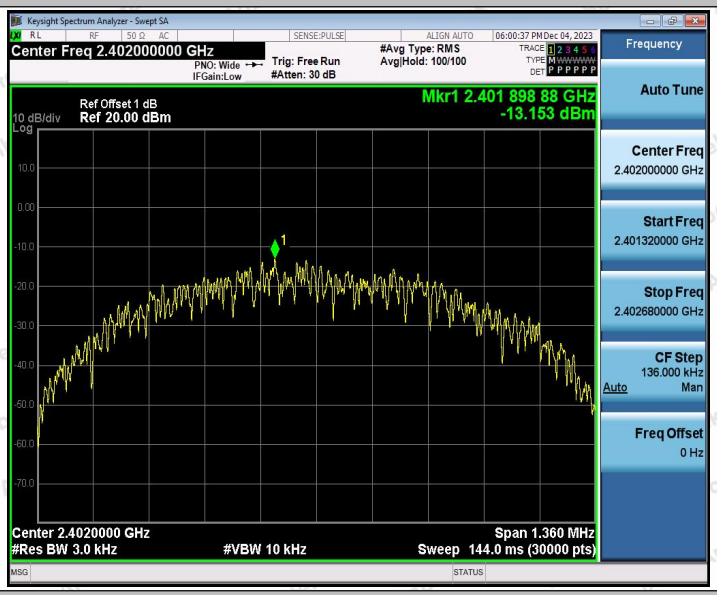
# Appendix D: Maximum power spectral density

## Test Result

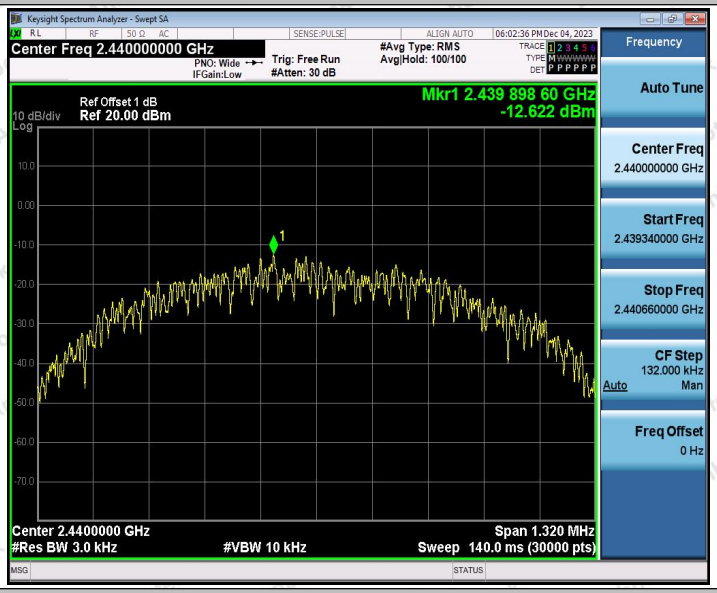
| TestMode | Antenna | Frequency[MHz] | Result[dBm/3kHz] | Limit[dBm/3kHz] | Verdict |
|---|---|---|---|---|---|
| BLE_1M | Ant1 | 2402 | -13.15 | ≤8.00 | PASS |
| | | 2440 | -12.62 | ≤8.00 | PASS |
| | | 2480 | -13.48 | ≤8.00 | PASS |

## Test Graphs

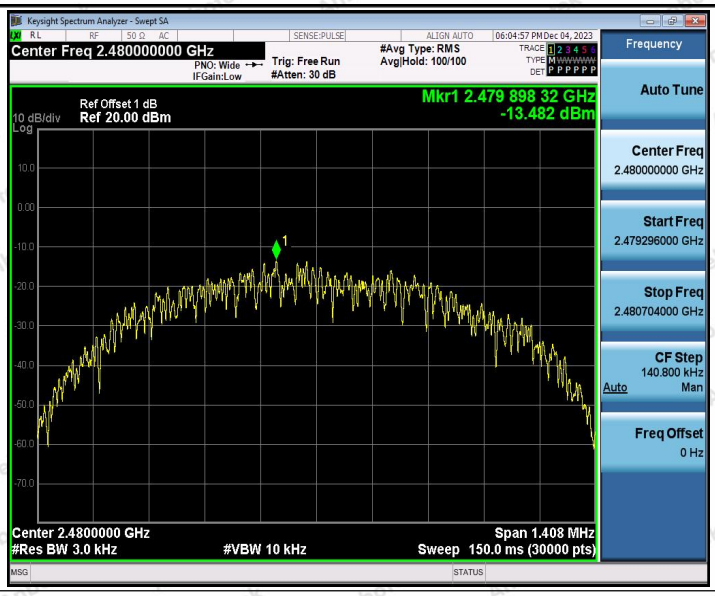
BLE_1M_Ant1_2402




BLE_1M_Ant1_2440




BLE_1M_Ant1_2480


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 100/100
06:04:57 PM Dec 04, 2023
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.479296000 GHz
Stop Freq
2.480704000 GHz
CF Step
140.800 kHz
Auto
Man
Freq Offset
0 Hz
Ref Offset 1 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.479 898 32 GHz
-13.482 dBm
Center 2.4800000 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 1.408 MHz
Sweep 150.0 ms (30000 pts)

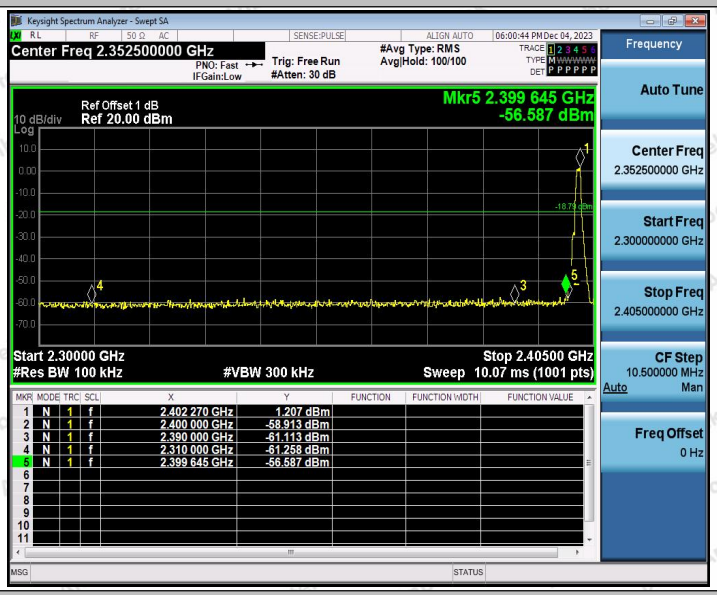
# Appendix E: Band edge measurements

## Test Result

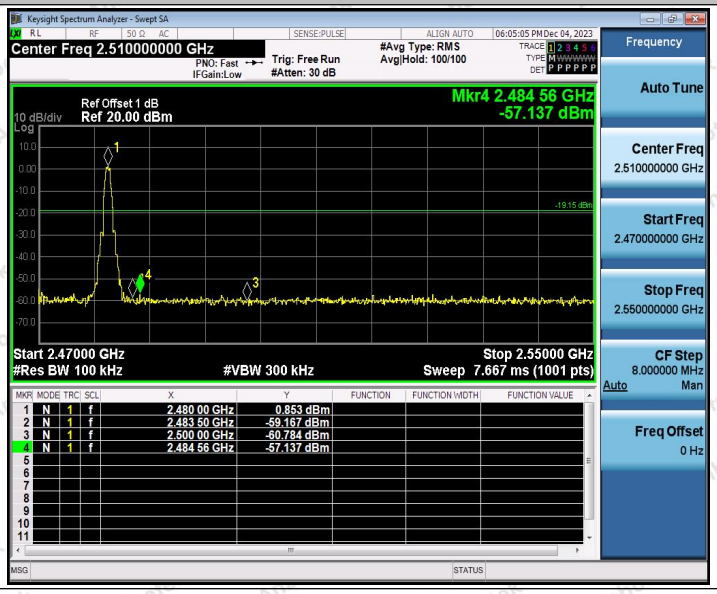
| TestMode | Antenna | ChName | Frequency[MHz] | RefLevel[dBm] | Result[dBm] | Limit[dBm] | Verdict |
|---|---|---|---|---|---|---|---|
| BLE_1M | Ant1 | Low | 2402 | 1.21 | -56.59 | ≤-18.79 | PASS |
| | | High | 2480 | 0.85 | -57.14 | ≤-19.15 | PASS |

## Test Graphs

BLE_1M_Ant1_Low_2402




BLE_1M_Ant1_High_2480



# Appendix F: Conducted Spurious Emission

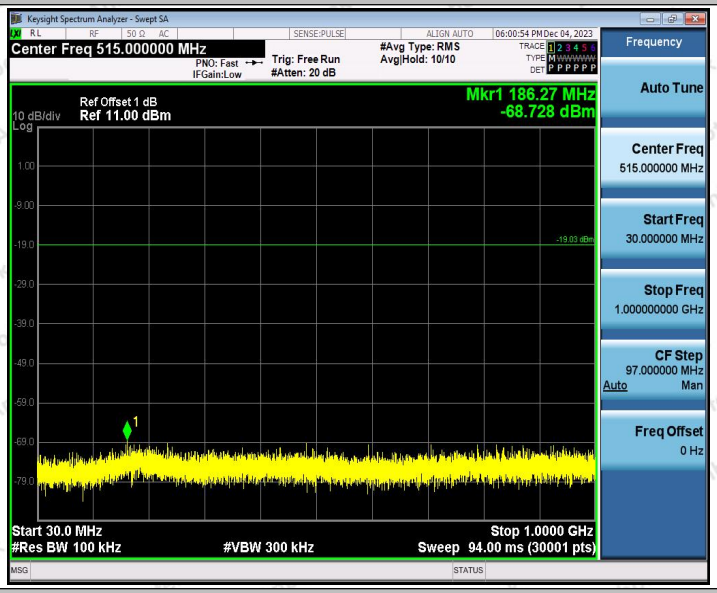
## Test Result

| TestMode | Antenna | Frequency[MHz] | FreqRange [MHz] | RefLevel [dBm] | Result[dBm] | Limit[dBm] | Verdict |
|---|---|---|---|---|---|---|---|
| BLE_1M | Ant1 | 2402 | Reference | 0.97 | 0.97 | --- | PASS |
| | | | 30~1000 | 0.97 | -68.73 | ≤-19.03 | PASS |
| | | | 1000~26500 | 0.97 | -54.02 | ≤-19.03 | PASS |
| | | 2440 | Reference | 1.33 | 1.33 | --- | PASS |
| | | | 30~1000 | 1.33 | -68.67 | ≤-18.67 | PASS |
| | | | 1000~26500 | 1.33 | -53.76 | ≤-18.67 | PASS |
| | | 2480 | Reference | -0.52 | -0.52 | --- | PASS |
| | | | 30~1000 | -0.52 | -68.96 | ≤-20.52 | PASS |
| | | | 1000~26500 | -0.52 | -53.87 | ≤-20.52 | PASS |

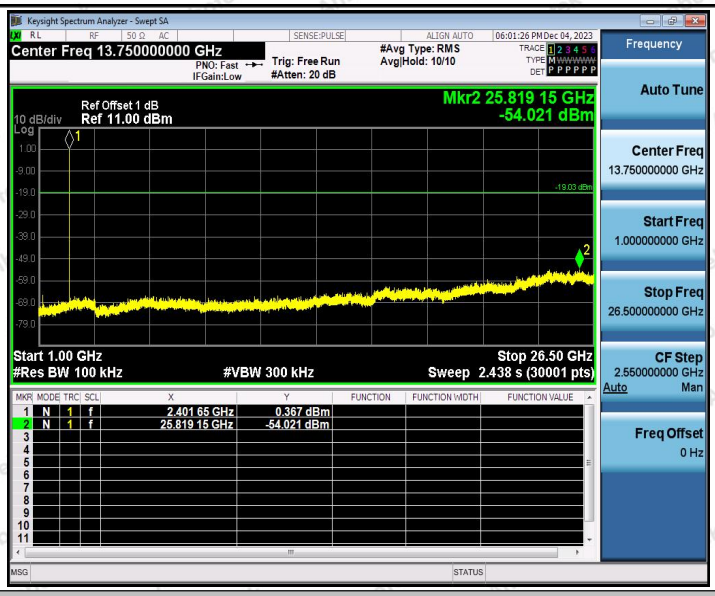
## Test Graphs

BLE_1M_Ant1_2402_0~Reference

BLE_1M_Ant1_2402_30~1000

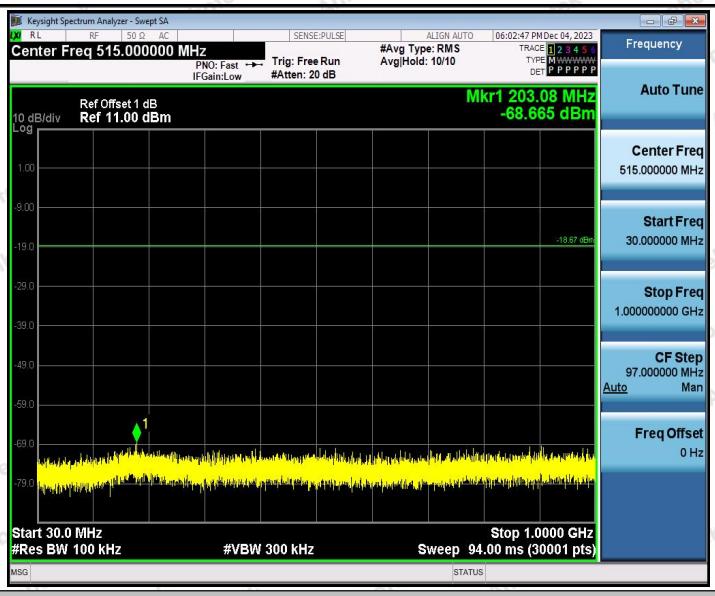



BLE_1M_Ant1_2402_1000~26500

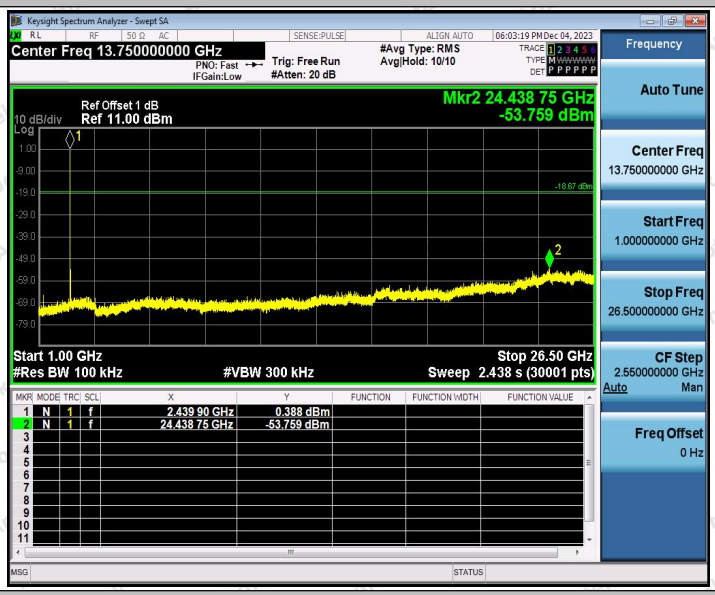



BLE_1M_Ant1_2440_0~Reference

BLE_1M_Ant1_2440_30~1000

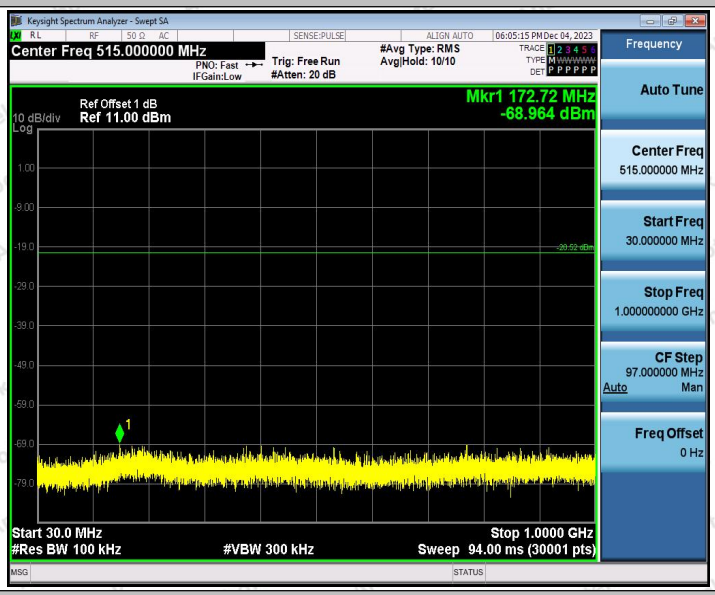



BLE_1M_Ant1_2440_1000~26500

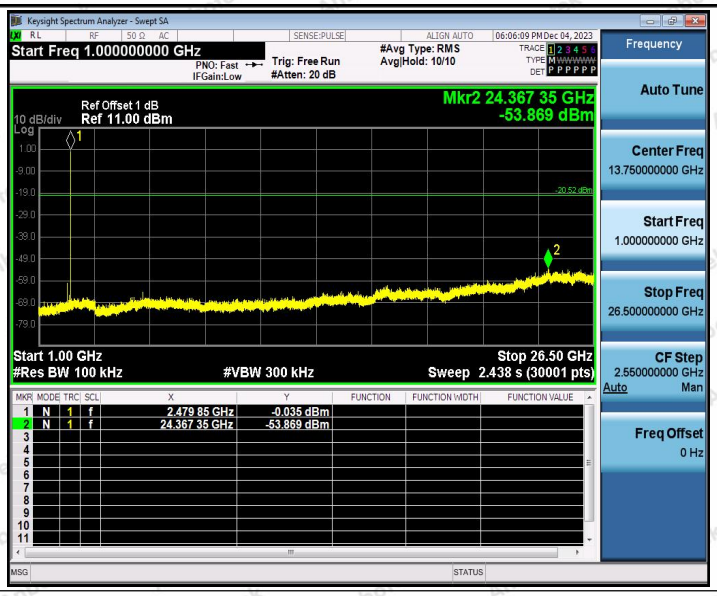



BLE_1M_Ant1_2480_0~Reference

BLE_1M_Ant1_2480_30~1000




BLE_1M_Ant1_2480_1000~26500


Keysight Spectrum Analyzer - Swept SA
Start Freq 1.000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
Avg|Hold: 10/10
06:06:09 PM Dec 04, 2023
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Mkr2 24.367 35 GHz
-53.869 dBm
Start 1.00 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 26.50 GHz
Sweep 2.438 s (30001 pts)
1 N 1 f 2.479 85 GHz -0.035 dBm
2 N 1 f 24.367 35 GHz -53.869 dBm
Frequency
Auto Tune
Center Freq
13.750000000 GHz
Start Freq
1.000000000 GHz
Stop Freq
26.500000000 GHz
CF Step
2.550000000 GHz
Auto Man
Freq Offset
0 Hz

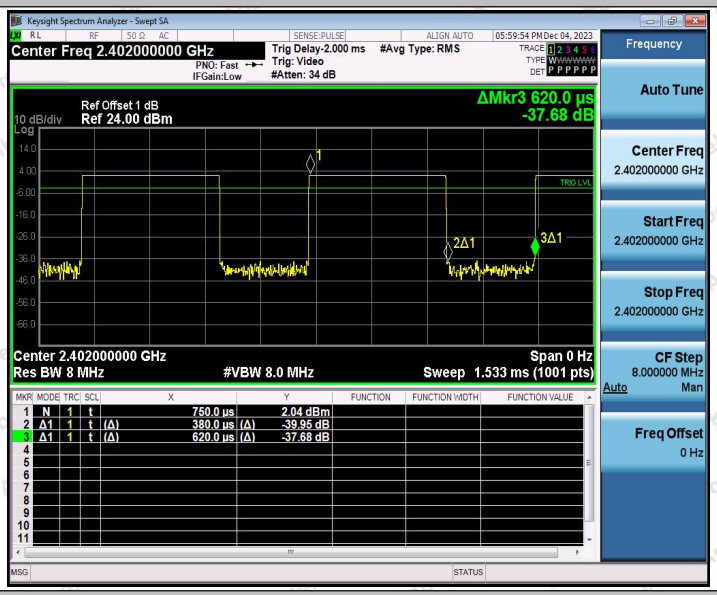
# Appendix G: Duty Cycle

## Test Result

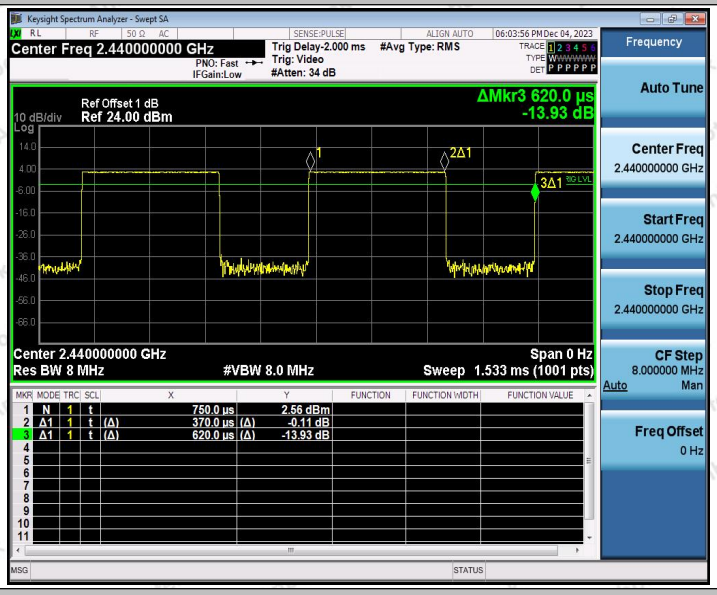
| TestMode | Antenna | Frequency[MHz] | ON Time [ms] | Period [ms] | Duty Cycle [%] | Duty Cycle Factor[dB] |
|---|---|---|---|---|---|---|
| BLE_1M | Ant1 | 2402 | 0.38 | 0.62 | 61.29 | 2.13 |
| | | 2440 | 0.37 | 0.62 | 59.68 | 2.24 |
| | | 2480 | 0.38 | 0.63 | 60.32 | 2.20 |

## Test Graphs

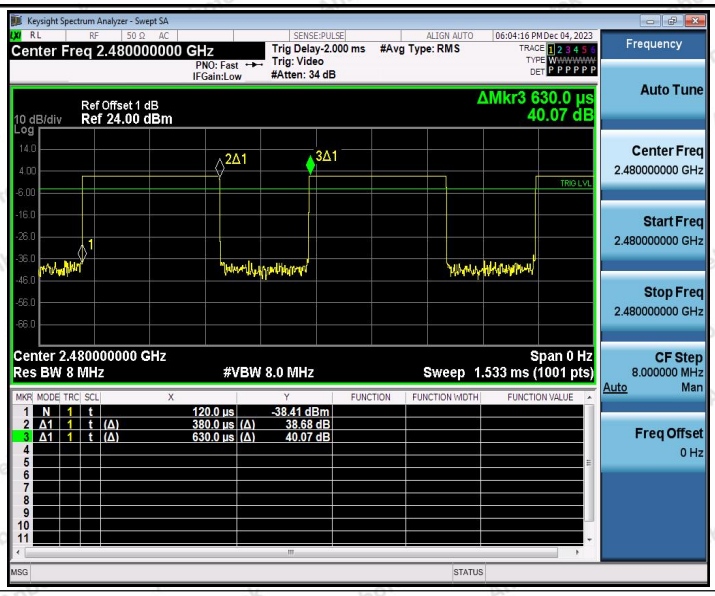
BLE_1M_Ant1_2402




BLE_1M_Ant1_2440




BLE_1M_Ant1_2480


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
Trig Delay-2.000 ms
Trig: Video
#Atten: 34 dB
#Avg Type: RMS
Ref Offset 1 dB
10 dB/div
Ref 24.00 dBm
ΔMkr3 630.0 µs
40.07 dB
Center 2.480000000 GHz
Res BW 8 MHz
#VBW 8.0 MHz
Span 0 Hz
Sweep 1.533 ms (1001 pts)
1 N 1 t 120.0 µs -38.41 dBm
2 Δ1 1 t (Δ) 380.0 µs (Δ) 38.68 dB
3 Δ1 1 t (Δ) 630.0 µs (Δ) 40.07 dB
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.480000000 GHz
Stop Freq
2.480000000 GHz
CF Step
8.000000 MHz
Auto Man
Freq Offset
0 Hz

---End---