# Appendix Test Data

| | | | |
|---|---|---|---|
| Report No.: | 18220WC30001802 | Test Sample No.: | 1-2-2 |
| Start Test Date: | 2023.1.5 | Finish Test Date: | 2023.1.11 |
| Test Engineer: | Tony.He | Auditor: | Edward.Pan |
| Temperature: | 24.3℃ | Relative Humidity: | 47 % |
| Pressure: | 1012 hPa | | |

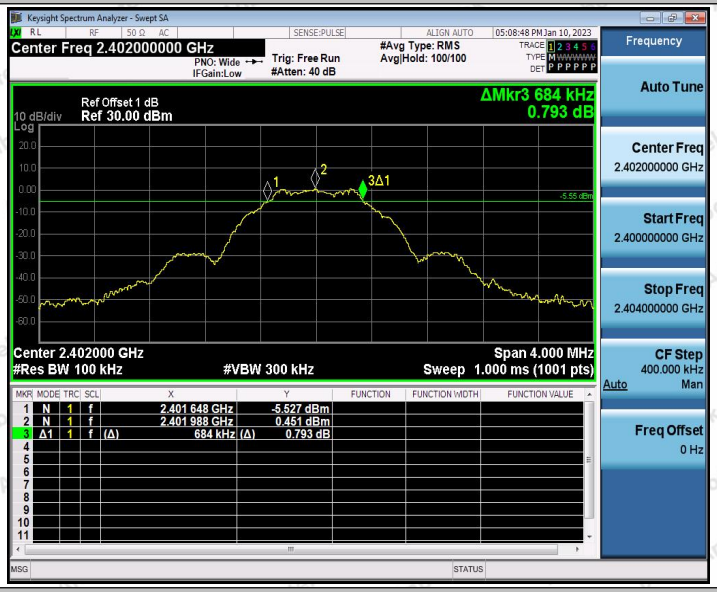
## Appendix A: DTS Bandwidth

### Test Result

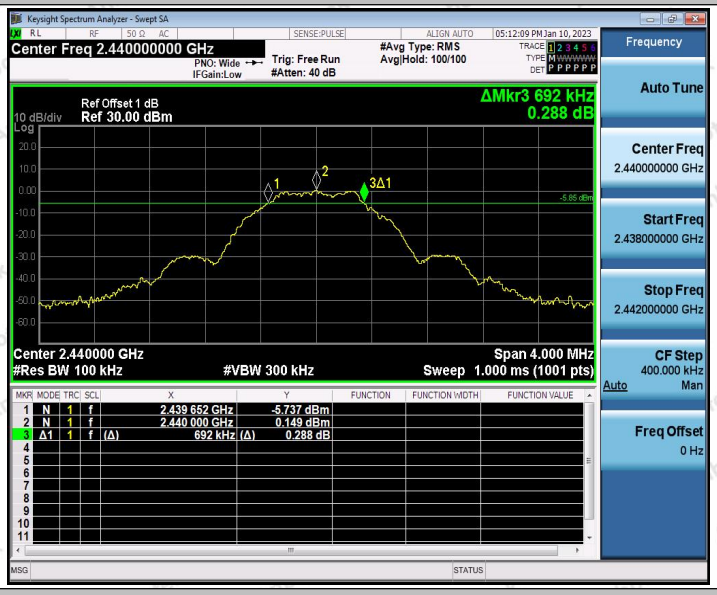
| Test Mode | Antenna | Frequency[MHz] | DTS BW [MHz] | FL[MHz] | FH[MHz] | Limit[MHz] | Verdict |
|---|---|---|---|---|---|---|---|
| BLE_1M | Ant1 | 2402 | 0.684 | 2401.648 | 2402.332 | 0.5 | PASS |
| | | 2440 | 0.692 | 2439.652 | 2440.344 | 0.5 | PASS |
| | | 2480 | 0.688 | 2479.648 | 2480.336 | 0.5 | PASS |

## Test Graphs

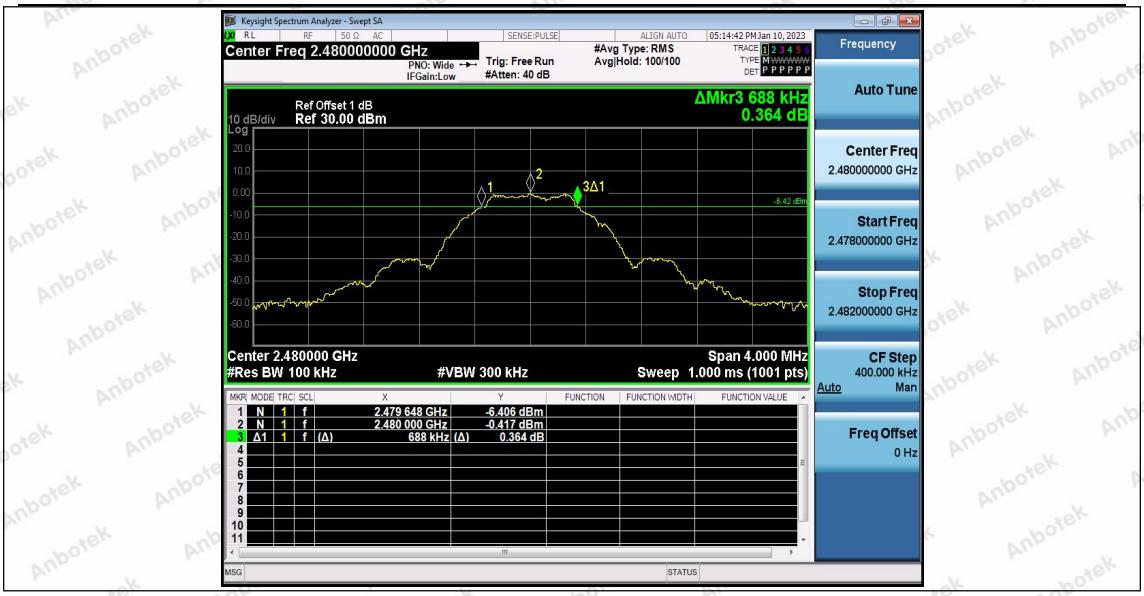
BLE_1M_Ant1_2402




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
05:14:42 PM Jan 10, 2023
Frequency
Ref Offset 1 dB
10 dB/div
Log
Ref 30.00 dBm
ΔMkr3 688 kHz
0.364 dB
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 2.479 648 GHz -6.406 dBm
2 N 1 f 2.480 000 GHz -0.417 dBm
3 Δ1 1 f (Δ) 688 kHz (Δ) 0.364 dB
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
MSG
STATUS

# Appendix B: Occupied Channel Bandwidth

## Test Result

| Test Mode | Antenna | Frequency[MHz] | OCB [MHz] | FL[MHz] | FH[MHz] |
|---|---|---|---|---|---|
| BLE_1M | Ant1 | 2402 | 1.0322 | 2401.4961 | 2402.5283 |
| | | 2440 | 1.0336 | 2439.4962 | 2440.5298 |
| | | 2480 | 1.0301 | 2479.4969 | 2480.5270 |

## 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
#IFGain:Low
Radio Std: None
Radio Device: BTS
Frequency
Ref Offset 1 dB
10 dB/div
Ref 30.00 dBm
Log
Mkr1 2.48 GHz
-3.3463 dBm
Center Freq
2.480000000 GHz
Center 2.48 GHz
#Res BW 43 kHz
#VBW 130 kHz
Span 4 MHz
Sweep 2.067 ms
CF Step
400.000 kHz
Auto
Man
Occupied Bandwidth
1.0301 MHz
Total Power 6.81 dBm
Transmit Freq Error 11.928 kHz
OBW Power 99.00 %
x dB Bandwidth 1.270 MHz
x dB -26.00 dB
Freq Offset
0 Hz
MSG
STATUS

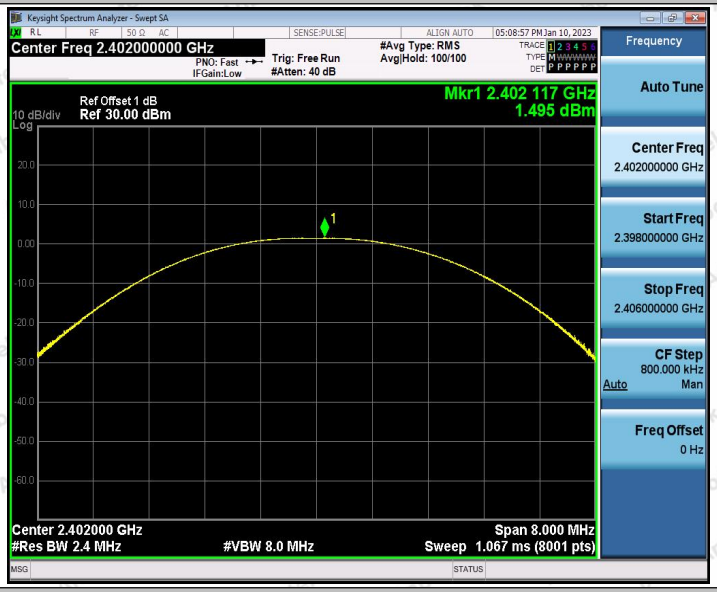
# Appendix C: Maximum conducted output power

## Test Result Peak

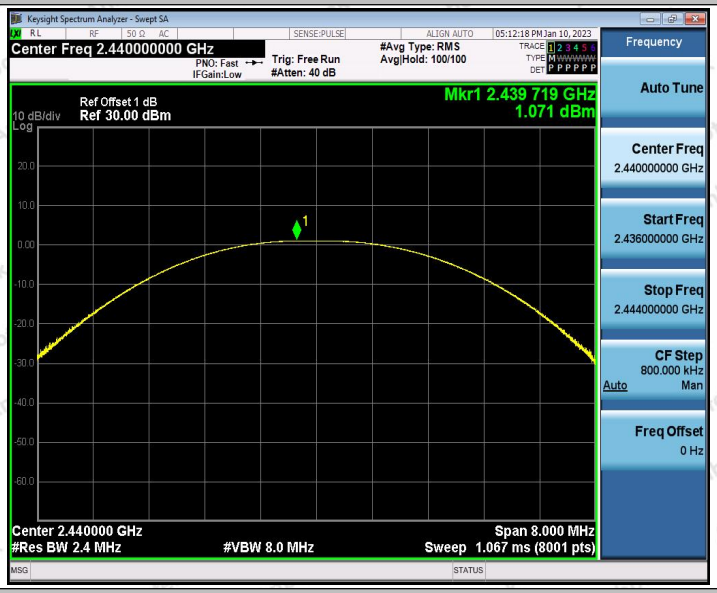
| Test Mode | Antenna | Frequency[MHz] | Conducted Peak Power[dBm] | Conducted Limit[dBm] | Verdict |
|---|---|---|---|---|---|
| BLE_1M | Ant1 | 2402 | 1.5 | ≤30 | PASS |
| | | 2440 | 1.07 | ≤30 | PASS |
| | | 2480 | 0.52 | ≤30 | PASS |

## Test Graphs Peak

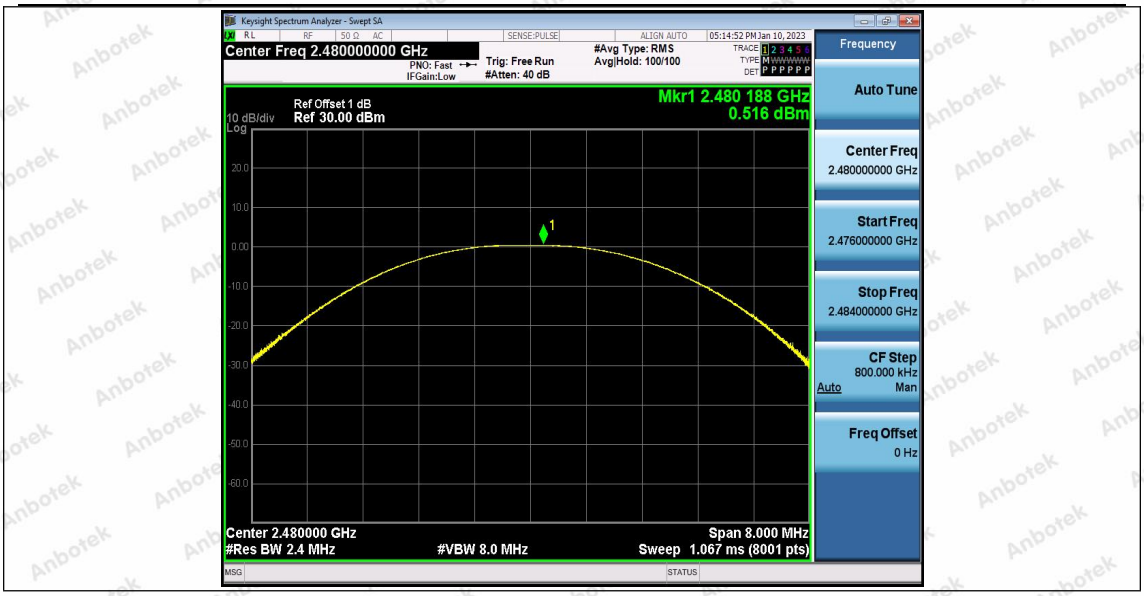
BLE_1M_Ant1_2402




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
05:14:52 PM Jan 10, 2023
Ref Offset 1 dB
10 dB/div
Log
Ref 30.00 dBm
Mkr1 2.480 188 GHz
0.516 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
MSG
STATUS

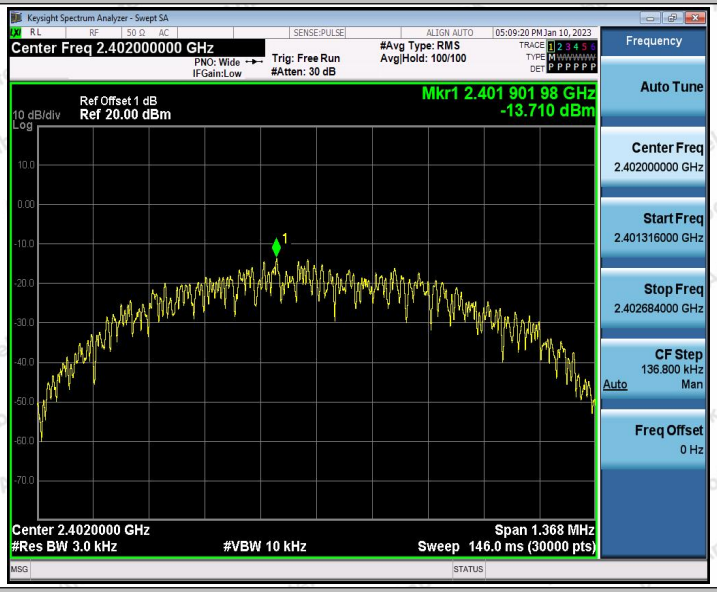
# Appendix D: Maximum power spectral density

## Test Result

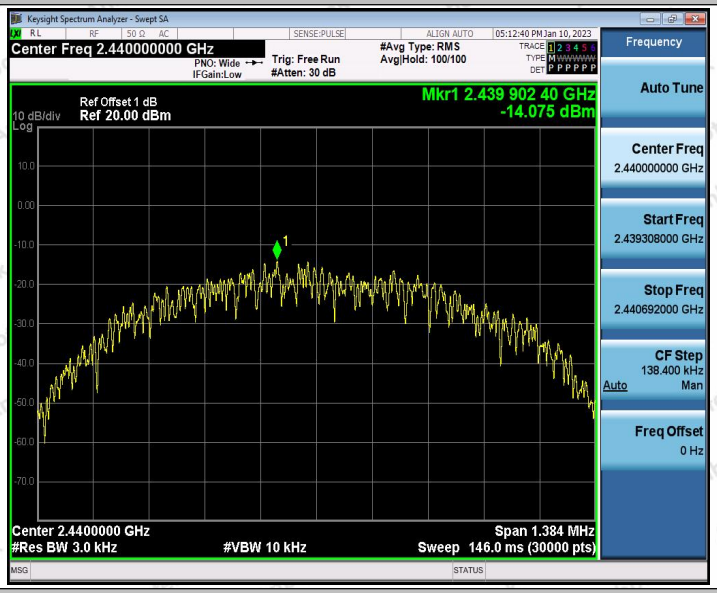
| Test Mode | Antenna | Frequency[MHz] | Result[dBm/3kHz] | Limit[dBm/3kHz] | Verdict |
|---|---|---|---|---|---|
| BLE_1M | Ant1 | 2402 | -13.71 | ≤8.00 | PASS |
| | | 2440 | -14.08 | ≤8.00 | PASS |
| | | 2480 | -14.61 | ≤8.00 | PASS |

## Test Graphs

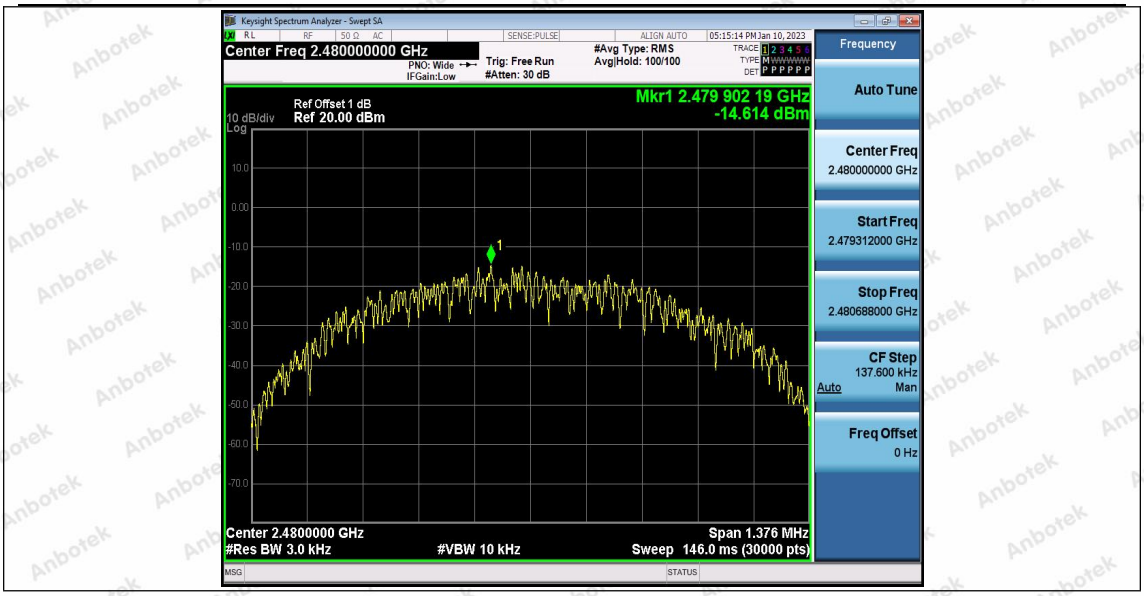
BLE_1M_Ant1_2402




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
05:15:14 PM Jan 10, 2023
Ref Offset 1 dB
10 dB/div
Log
Ref 20.00 dBm
Mkr1 2.479 902 19 GHz
-14.614 dBm
Center 2.4800000 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 1.376 MHz
Sweep 146.0 ms (30000 pts)
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.479312000 GHz
Stop Freq
2.480688000 GHz
CF Step
137.600 kHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

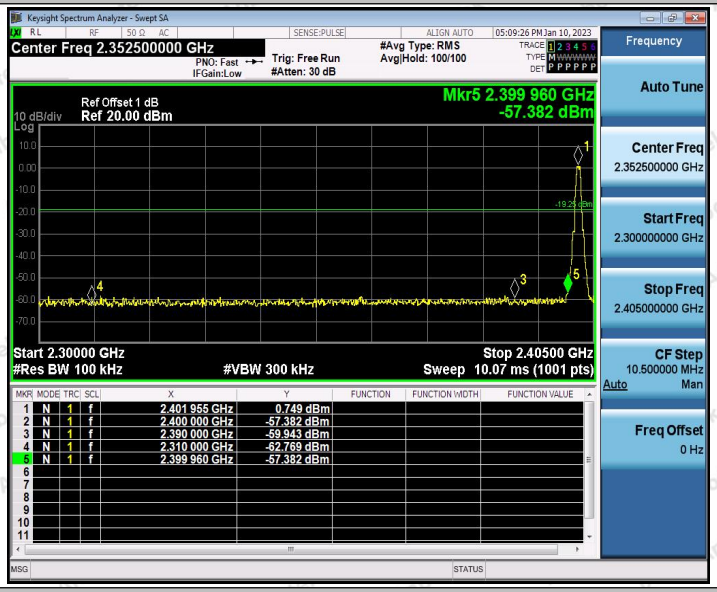
# Appendix E: Band edge measurements

## Test Result

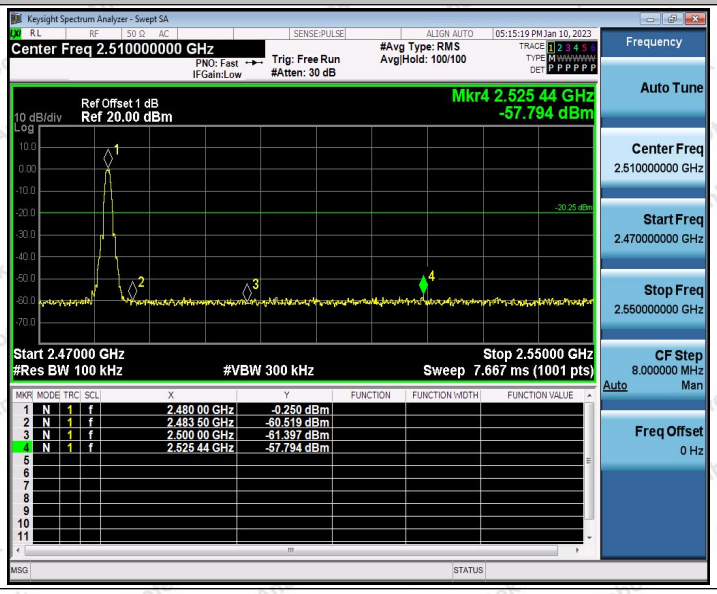
| TestMode | Antenna | ChName | Frequency [MHz] | RefLevel[dBm] | Result[dBm] | Limit[dBm] | Verdict |
|---|---|---|---|---|---|---|---|
| BLE_1M | Ant1 | Low | 2402 | 0.75 | -57.38 | ≤-19.25 | PASS |
| | | High | 2480 | -0.25 | -57.79 | ≤-20.25 | PASS |

## Test Graphs

BLE_1M_Ant1_Low_2402




BLE_1M_Ant1_High_2480



# Appendix F: Conducted Spurious Emission

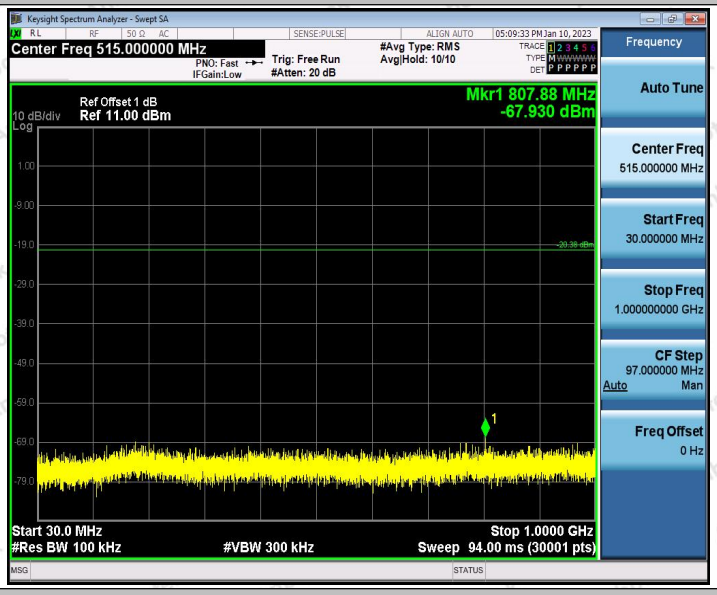
## Test Result

| TestMode | Antenna | Frequency [MHz] | FreqRange [MHz] | RefLevel [dBm] | Result[dBm] | Limit[dBm] | Verdict |
|---|---|---|---|---|---|---|---|
| BLE_1M | Ant1 | 2402 | Reference | -0.38 | -0.38 | --- | PASS |
| | | | 30~1000 | -0.38 | -67.93 | ≤-20.38 | PASS |
| | | | 1000~26500 | -0.38 | -52.91 | ≤-20.38 | PASS |
| | | 2440 | Reference | -0.20 | -0.20 | --- | PASS |
| | | | 30~1000 | -0.20 | -68.88 | ≤-20.2 | PASS |
| | | | 1000~26500 | -0.20 | -53.43 | ≤-20.2 | PASS |
| | | 2480 | Reference | -0.64 | -0.64 | --- | PASS |
| | | | 30~1000 | -0.64 | -68.14 | ≤-20.64 | PASS |
| | | | 1000~26500 | -0.64 | -53.02 | ≤-20.64 | PASS |

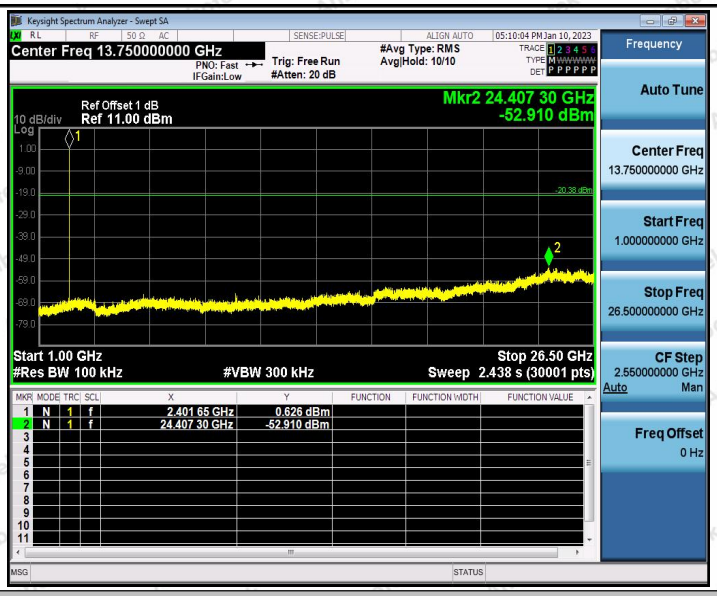
## Test Graphs

BLE_1M_Ant1_2402_0~Reference

BLE_1M_Ant1_2402_30~1000

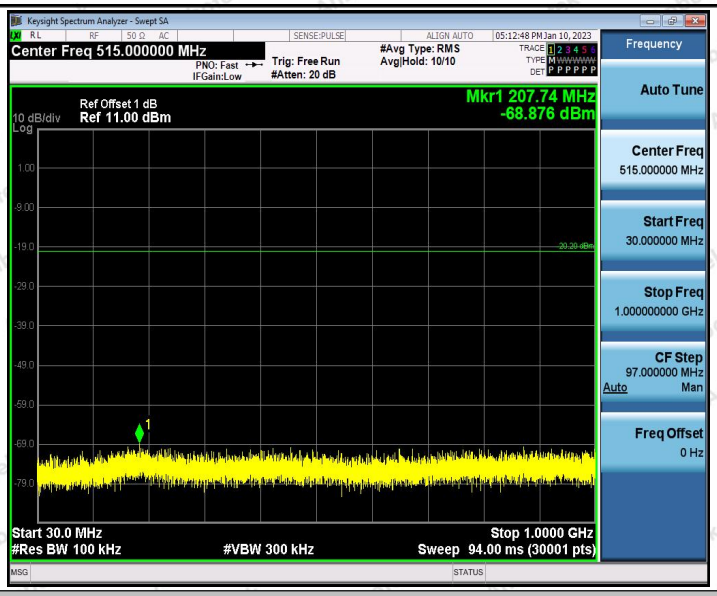



BLE_1M_Ant1_2402_1000~26500

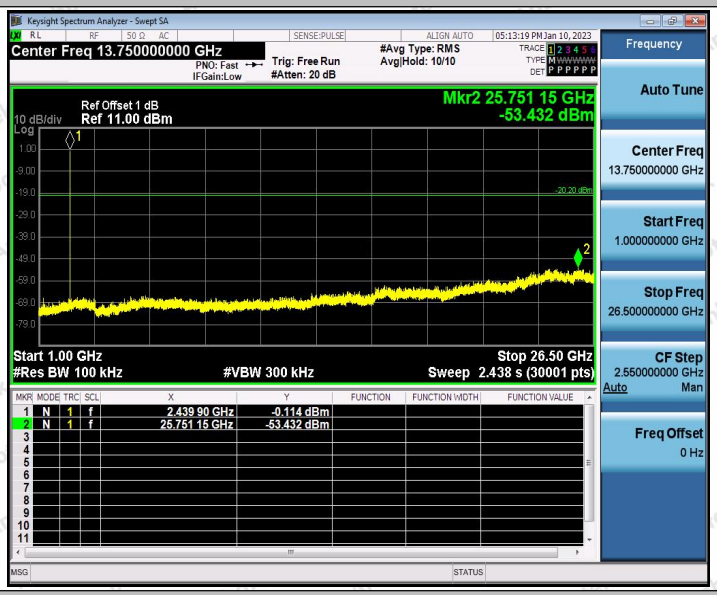



BLE_1M_Ant1_2440_0~Reference

BLE_1M_Ant1_2440_30~1000

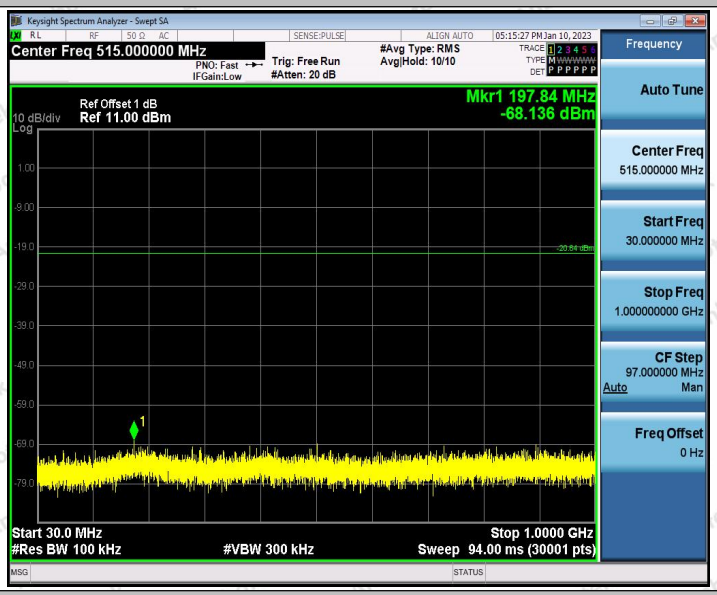



BLE_1M_Ant1_2440_1000~26500

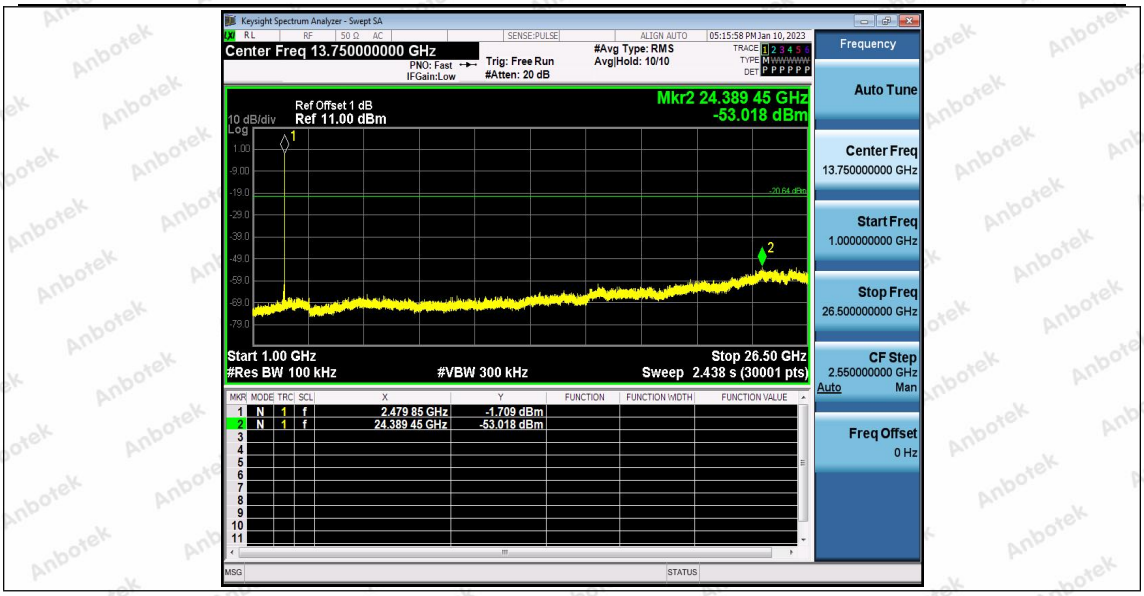



BLE_1M_Ant1_2480_0~Reference

BLE_1M_Ant1_2480_30~1000




BLE_1M_Ant1_2480_1000~26500


Keysight Spectrum Analyzer - Swept SA
Center Freq 13.750000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
#Avg Type: RMS
Avg|Hold: 10/10
05:15:58 PM Jan 10, 2023
Ref Offset 1 dB
10 dB/div
Ref 11.00 dBm
Log
Mkr2 24,389 45 GHz
-53.018 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 -1.709 dBm
2 N 1 f 24.389 45 GHz -53.018 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

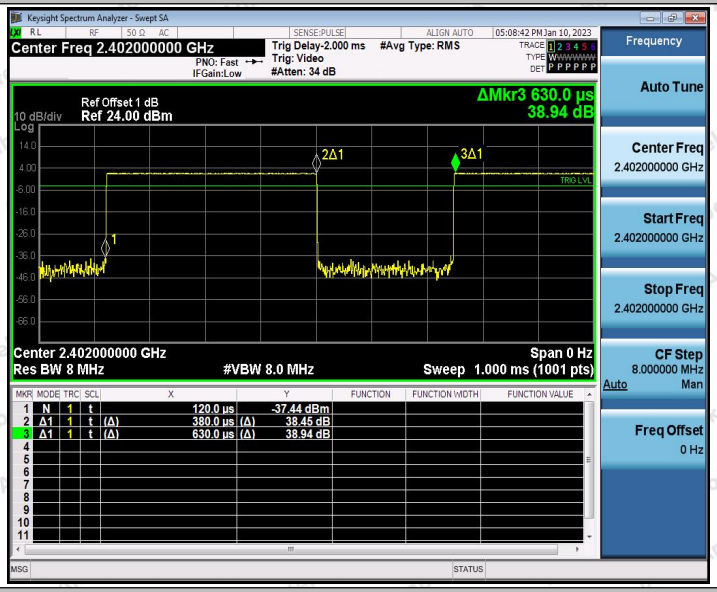
# Appendix G: Duty Cycle

## Test Result

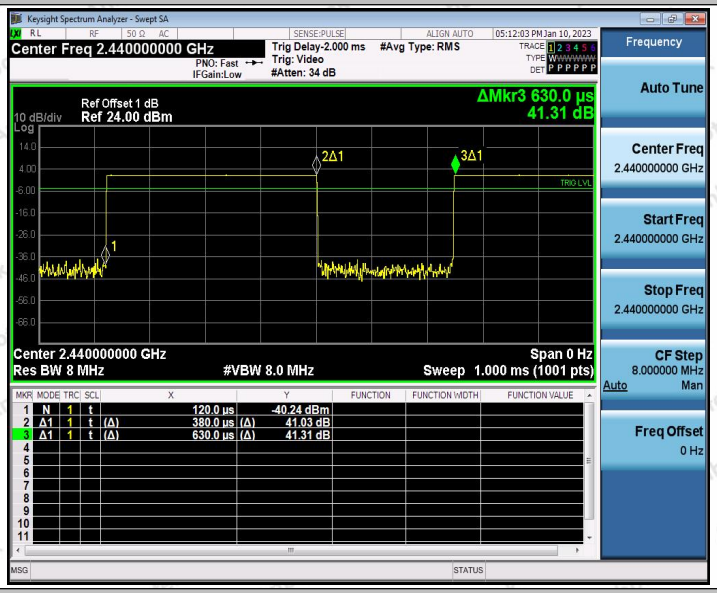
| TestMode | Antenna | Frequency[MHz] | ON Time [ms] | Period [ms] | Duty Cycle [%] | Duty Cycle Factor[dB] |
|---|---|---|---|---|---|---|
| BLE_1M | Ant1 | 2402 | 0.38 | 0.63 | 60.32 | 2.20 |
| | | 2440 | 0.38 | 0.63 | 60.32 | 2.20 |
| | | 2480 | 0.38 | 0.63 | 60.32 | 2.20 |

## Test Graphs

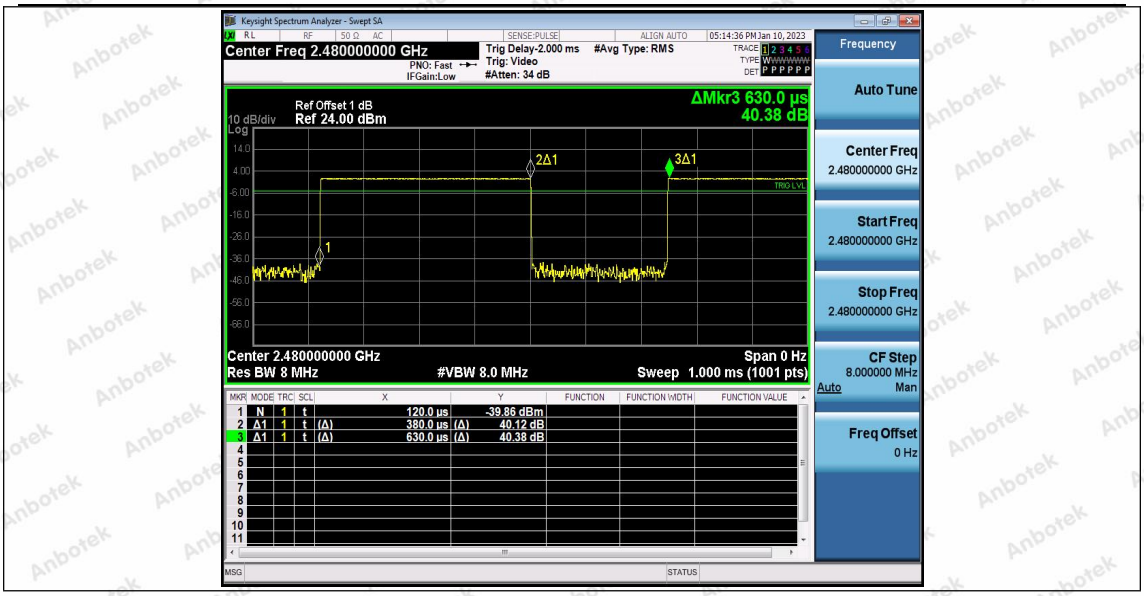
BLE_1M_Ant1_2402




BLE_1M_Ant1_2440




BLE_1M_Ant1_2480


Keysight Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Fast
IFGain:Low
Trig Delay-2.000 ms
Trig: Video
#Atten: 34 dB
#Avg Type: RMS
05:14:36 PM Jan 10, 2023
Frequency
Ref Offset 1 dB
10 dB/div
Log
Ref 24.00 dBm
ΔMkr3 630.0 µs
40.38 dB
2Δ1
3Δ1
1
Center 2.480000000 GHz
Res BW 8 MHz
#VBW 8.0 MHz
Span 0 Hz
Sweep 1.000 ms (1001 pts)
1 N 1 t 120.0 µs -39.86 dBm
2 Δ1 1 t (Δ) 380.0 µs (Δ) 40.12 dB
3 Δ1 1 t (Δ) 630.0 µs (Δ) 40.38 dB
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
MSG
STATUS

---End---