# Appendix Test Data

| | | | |
|---|---|---|---|
| Report No.: | 18220WC20066901 | Test Sample No.: | 1-2-2 |
| Start Test Date: | 2022.4.1 | Finish Test Date: | 2022.4.7 |
| Test Engineer: | Tony.He | Auditor: | Edward.Pan |
| Temperature: | 24.3℃ | Relative Humidity: | 55.7 % |
| Pressure: | 1012 hPa | | |

## Appendix A: DTS Bandwidth

### Test Result

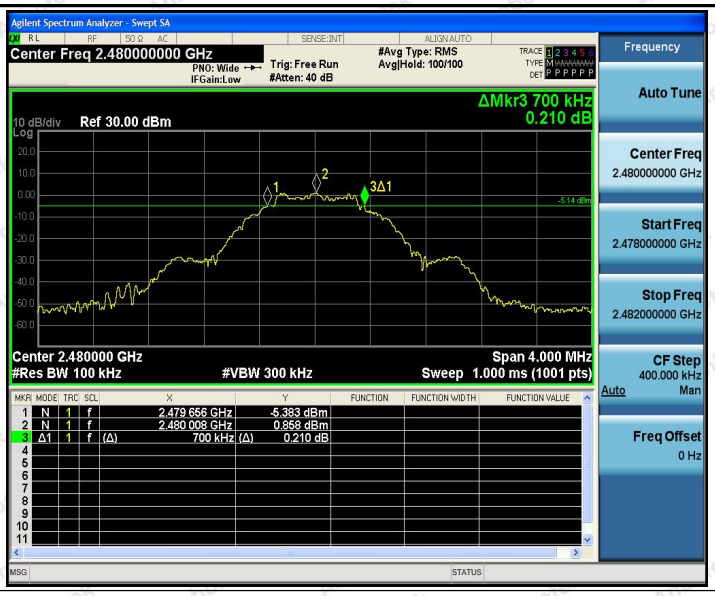
| Test Mode | Antenna | Channel | DTS BW [MHz] | FL[MHz] | FH[MHz] | Limit[MHz] | Verdict |
|---|---|---|---|---|---|---|---|
| BLE_1M | Ant1 | 2402 | 0.692 | 2401.664 | 2402.356 | ≥0.5 | PASS |
| | | 2440 | 0.692 | 2439.660 | 2440.352 | ≥0.5 | PASS |
| | | 2480 | 0.700 | 2479.656 | 2480.356 | ≥0.5 | PASS |

## Test Graphs

BLE_1M_Ant1_2402

BLE_1M_Ant1_2440

BLE_1M_Ant1_2480


Agilent 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
ΔMkr3 700 kHz
0.210 dB
10 dB/div
Ref 30.00 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 2.479 656 GHz -5.383 dBm
2 N 1 f 2.480 008 GHz 0.858 dBm
3 Δ1 1 f (Δ) 700 kHz (Δ) 0.210 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

| Test Mode | Antenna | Channel | OCB [MHz] | FL[MHz] | FH[MHz] | Limit[MHz] | Verdict |
|---|---|---|---|---|---|---|---|
| BLE_1M | Ant1 | 2402 | 1.0552 | 2401.483 | 2402.539 | --- | PASS |
| | | 2440 | 1.0582 | 2439.482 | 2440.540 | --- | PASS |
| | | 2480 | 1.0628 | 2479.487 | 2480.550 | --- | PASS |

## Test Graphs

BLE_1M_Ant1_2402

BLE_1M_Ant1_2440

BLE_1M_Ant1_2480

Agilent 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
Mkr1 2.48 GHz
0.49851 dBm
10 dB/div
Ref 30.00 dBm
Center 2.48 GHz
#Res BW 43 kHz
#VBW 150 kHz
Span 4 MHz
Sweep 2.067 ms
Occupied Bandwidth
1.0628 MHz
Total Power 7.73 dBm
Transmit Freq Error 18.208 kHz
OBW Power 99.00 %
x dB Bandwidth 1.298 MHz
x dB -26.00 dB
Frequency
Center Freq
2.480000000 GHz
CF Step
400.000 kHz
Auto Man
Freq Offset
0 Hz

# Appendix C: Maximum conducted output power

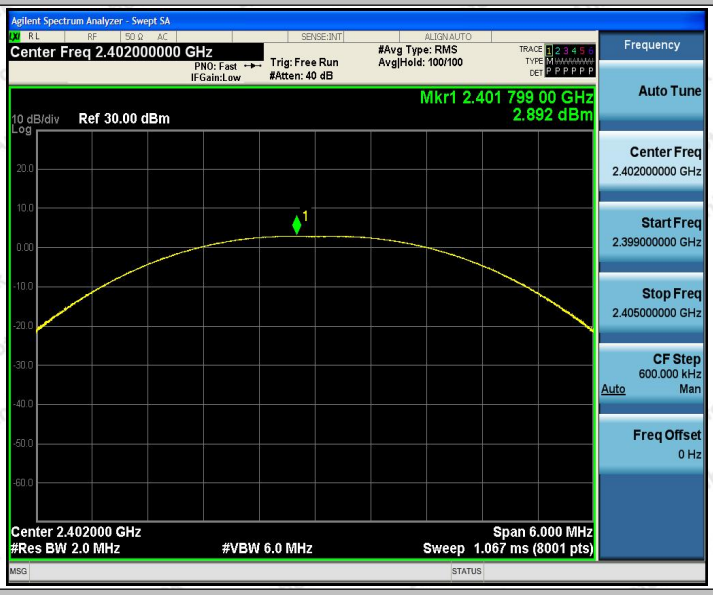
## Test Result

| Test Mode | Antenna | Channel | Result[dBm] | Limit[dBm] | Verdict |
|---|---|---|---|---|---|
| BLE_1M | Ant1 | 2402 | 2.89 | ≤28.45 | PASS |
| | | 2440 | 0.9 | ≤28.45 | PASS |
| | | 2480 | 1.56 | ≤28.45 | PASS |

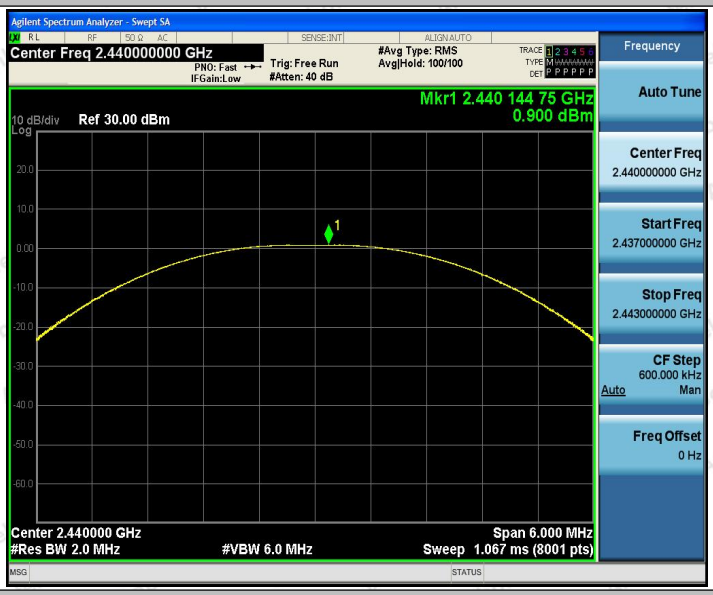
Note:Limit[dBm]=30dBm-(7.55dBi-6dB)=28.45dBm

## Test Graphs

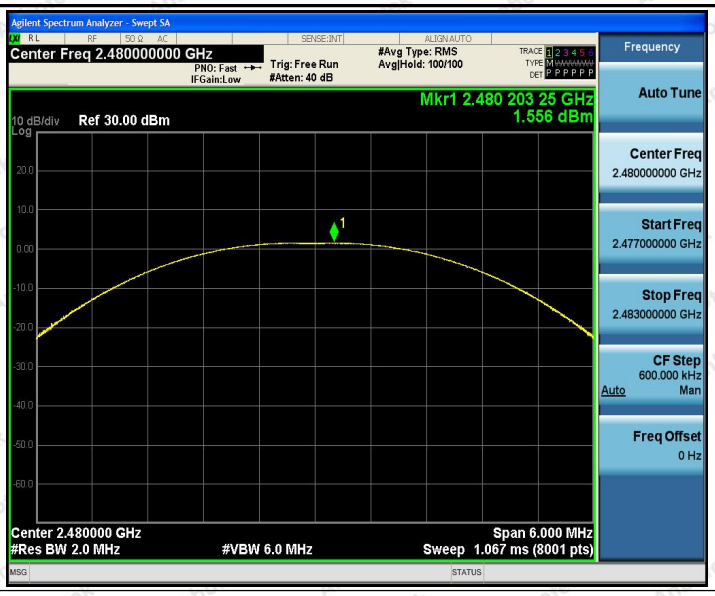
BLE_1M_Ant1_2402




BLE_1M_Ant1_2440




BLE_1M_Ant1_2480


Agilent 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
Mkr1 2.480 203 25 GHz
1.556 dBm
10 dB/div
Log
Ref 30.00 dBm
Center 2.480000 GHz
#Res BW 2.0 MHz
#VBW 6.0 MHz
Span 6.000 MHz
Sweep 1.067 ms (8001 pts)
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.477000000 GHz
Stop Freq
2.483000000 GHz
CF Step
600.000 kHz
Auto
Man
Freq Offset
0 Hz

# Appendix D: Maximum power spectral density

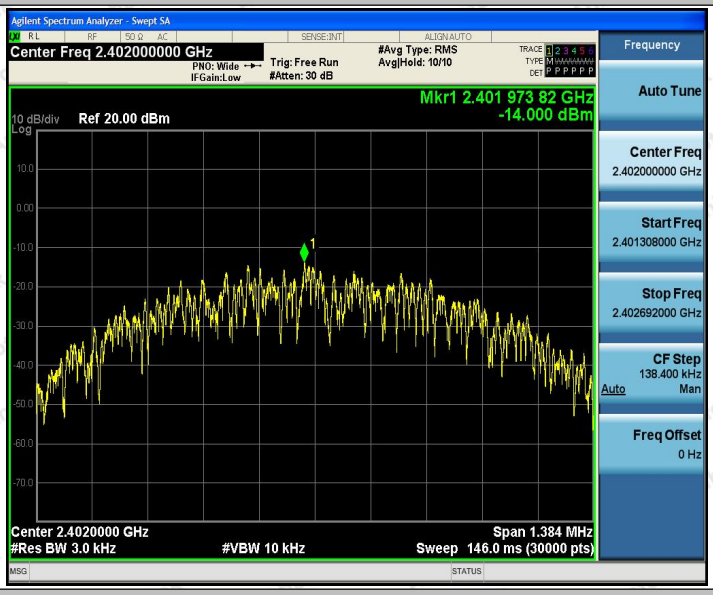
## Test Result

| Test Mode | Antenna | Channel | Result[dBm/3kHz] | Limit[dBm/3kHz] | Verdict |
|---|---|---|---|---|---|
| BLE_1M | Ant1 | 2402 | -14.00 | ≤6.45 | PASS |
| | | 2440 | -16.38 | ≤6.45 | PASS |
| | | 2480 | -15.24 | ≤6.45 | PASS |

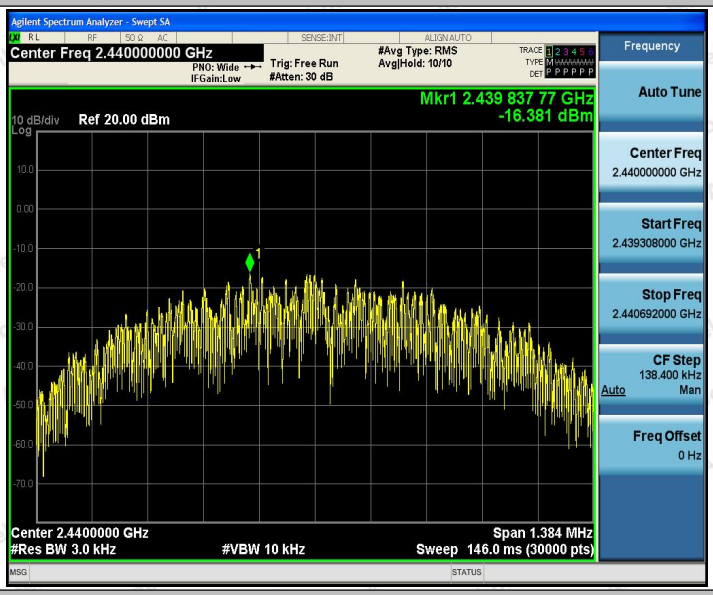
Note:Limit[dBm/3KHz]=8[dBm/3KHz]-(Gain7.55dBi-6dB)=8-1.55=6.45[dBm/3KHz]

## Test Graphs

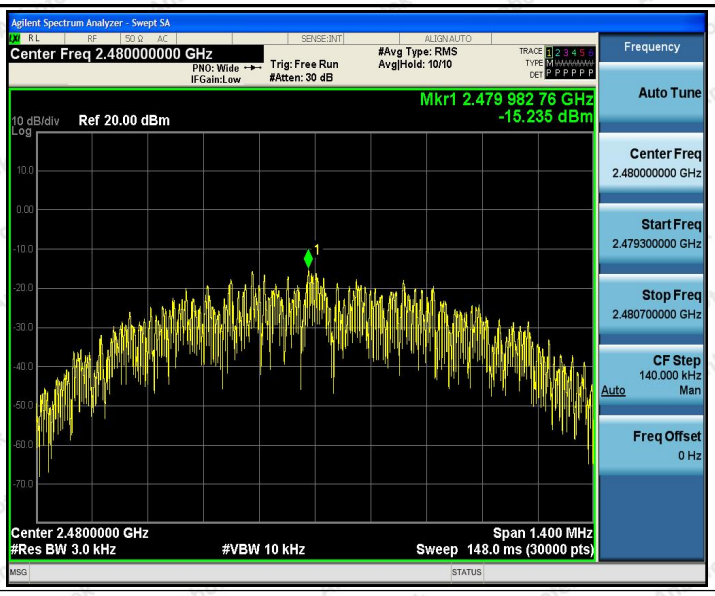
BLE_1M_Ant1_2402




BLE_1M_Ant1_2440




BLE_1M_Ant1_2480


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 30 dB
#Avg Type: RMS
Avg|Hold: 10/10
Mkr1 2.479 982.76 GHz
-15.235 dBm
10 dB/div
Log
Ref 20.00 dBm
Center 2.4800000 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 1.400 MHz
Sweep 148.0 ms (30000 pts)
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.479300000 GHz
Stop Freq
2.480700000 GHz
CF Step
140.000 kHz
Auto
Man
Freq Offset
0 Hz

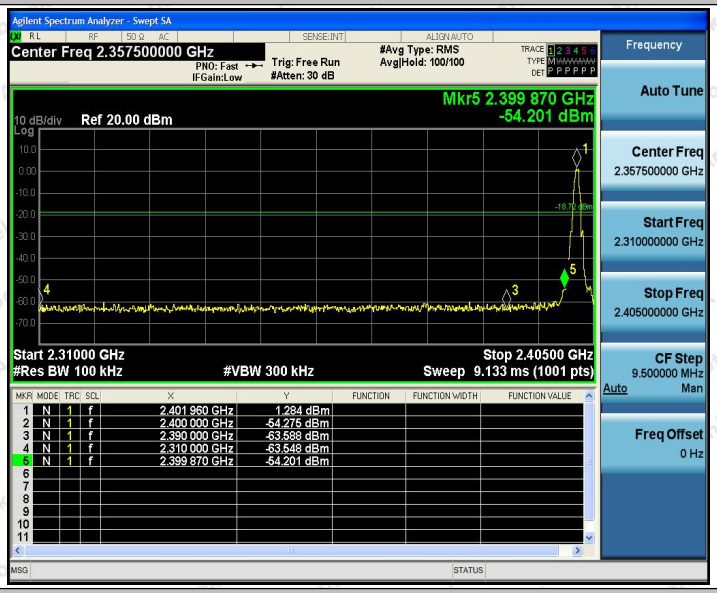
# Appendix E: Band edge measurements

## Test Result

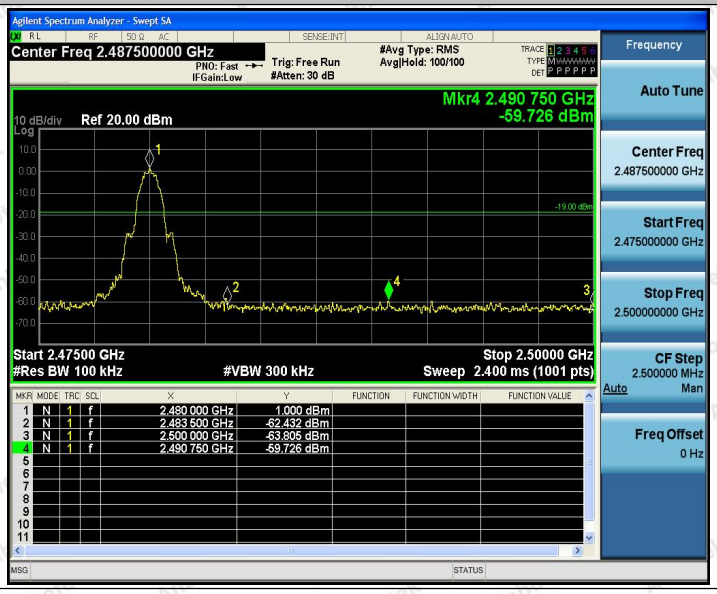
| Test Mode | Antenna | Ch Name | Channel | Ref Level[dBm] | Result[dBm] | Limit[dBm] | Verdict |
|---|---|---|---|---|---|---|---|
| BLE_1M | Ant1 | Low | 2402 | 1.28 | -54.2 | ≤-18.72 | PASS |
| | | High | 2480 | 1.00 | -59.73 | ≤-19 | PASS |

## Test Graphs

BLE_1M_Ant1_Low_2402




BLE_1M_Ant1_High_2480



# Appendix F: Conducted Spurious Emission

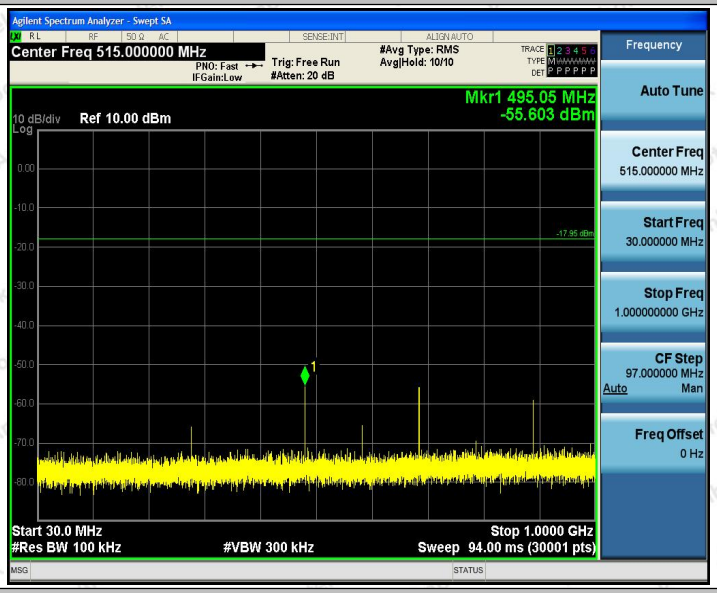
## Test Result

| Test Mode | Antenna | Channel | Freq Range [MHz] | Ref Level [dBm] | Result[dBm] | Limit[dBm] | Verdict |
|---|---|---|---|---|---|---|---|
| BLE_1M | Ant1 | 2402 | Reference | 2.05 | 2.05 | --- | PASS |
| | | | 30~1000 | 2.05 | -55.6 | ≤-17.95 | PASS |
| | | | 1000~26500 | 2.05 | -54.71 | ≤-17.95 | PASS |
| | | 2440 | Reference | 0.21 | 0.21 | --- | PASS |
| | | | 30~1000 | 0.21 | -55.62 | ≤-19.79 | PASS |
| | | | 1000~26500 | 0.21 | -55.29 | ≤-19.79 | PASS |
| | | 2480 | Reference | 0.87 | 0.87 | --- | PASS |
| | | | 30~1000 | 0.87 | -55.92 | ≤-19.13 | PASS |
| | | | 1000~26500 | 0.87 | -54.63 | ≤-19.13 | PASS |

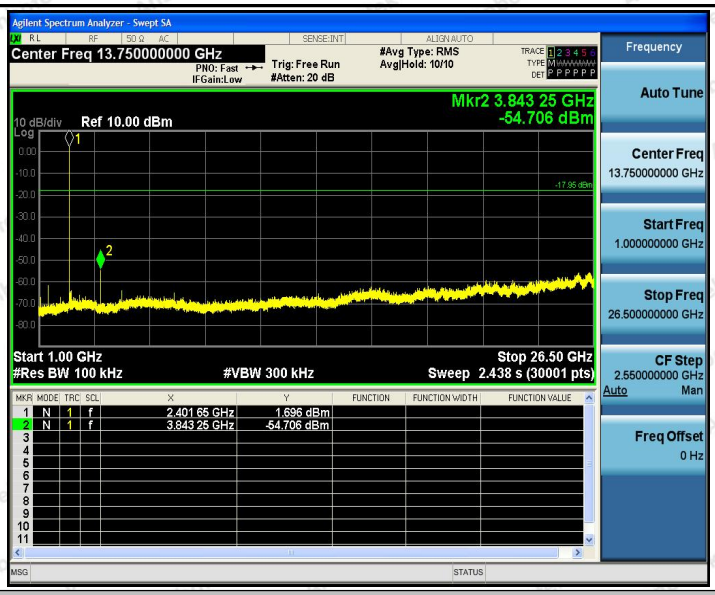
## Test Graphs

BLE_1M_Ant1_2402_0~Reference

BLE_1M_Ant1_2402_30~1000

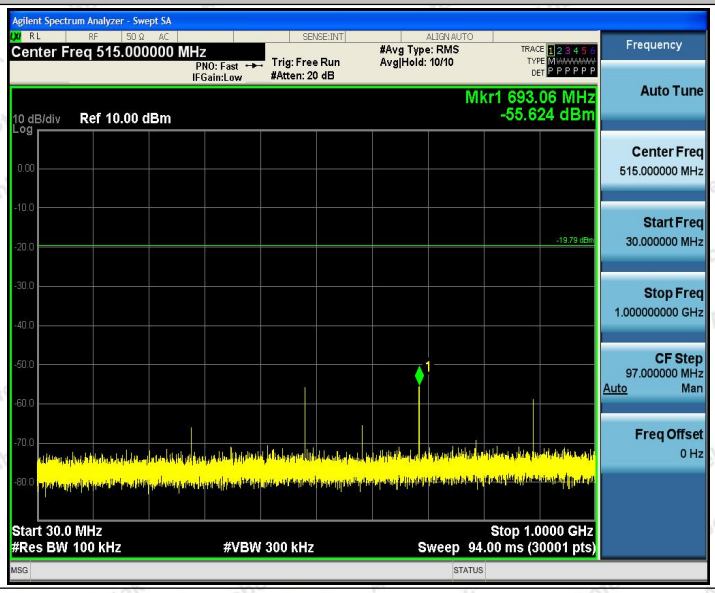



BLE_1M_Ant1_2402_1000~26500

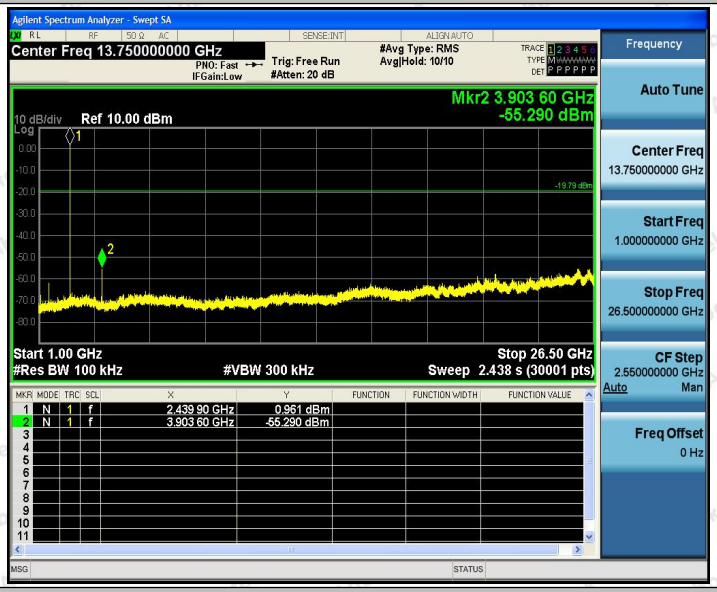



BLE_1M_Ant1_2440_0~Reference

BLE_1M_Ant1_2440_30~1000

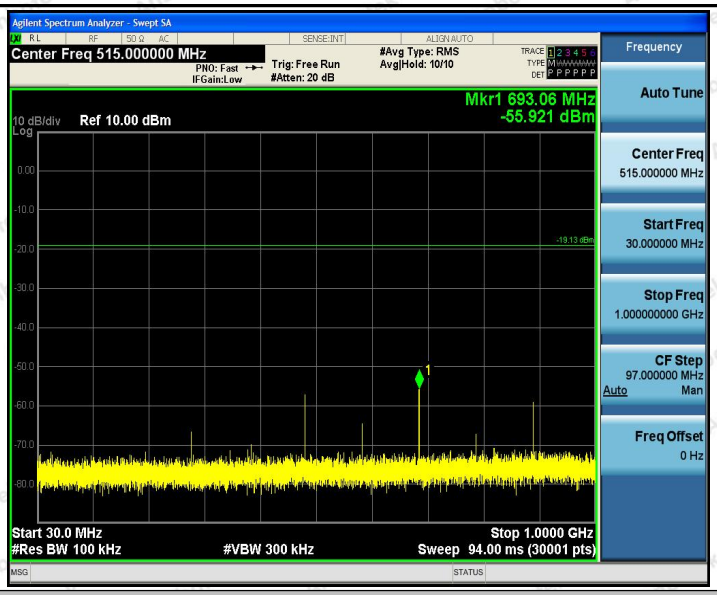


BLE_1M_Ant1_2440_1000~26500

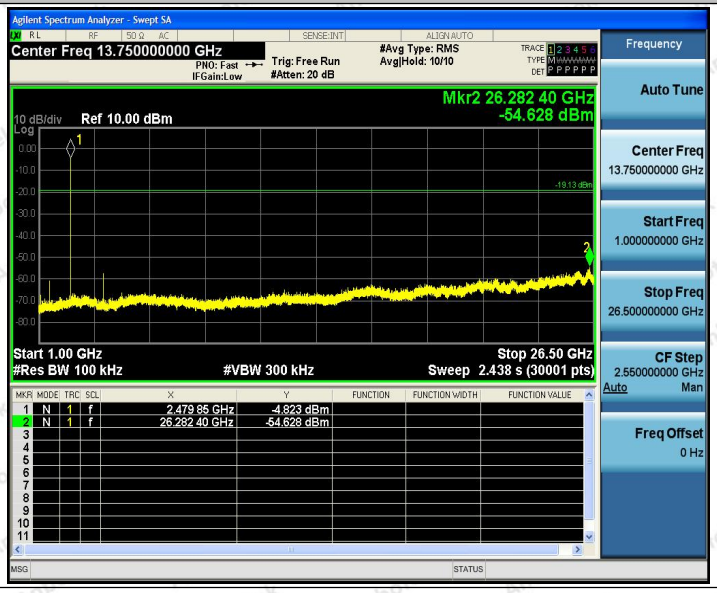



BLE_1M_Ant1_2480_0~Reference

BLE_1M_Ant1_2480_30~1000




BLE_1M_Ant1_2480_1000~26500



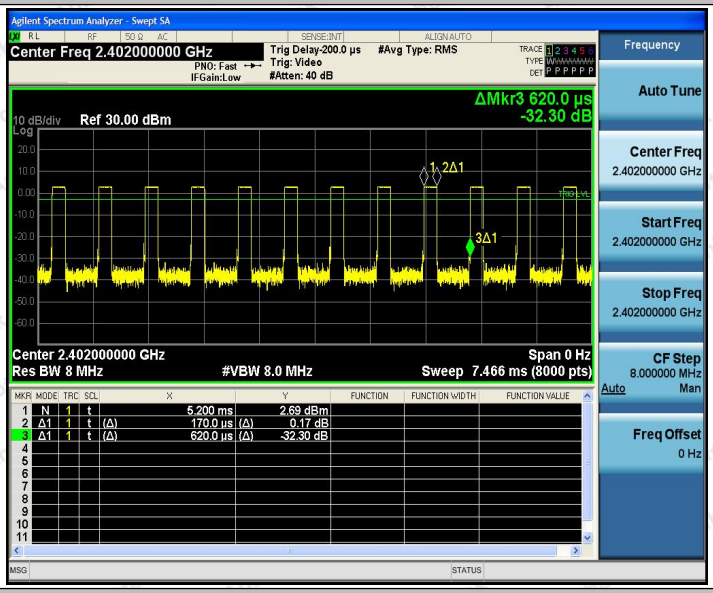
# Appendix G: Duty Cycle

## Test Result

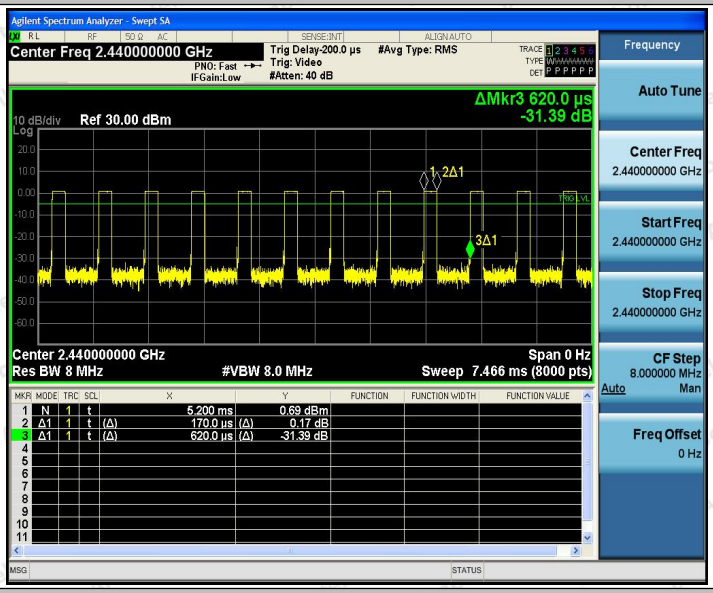
| Test Mode | Antenna | Channel | ON Time [ms] | Period [ms] | X | DC [%] | X Factor | Limit | Verdict |
|---|---|---|---|---|---|---|---|---|---|
| BLE_1M | Ant1 | 2402 | 0.17 | 0.62 | 0.2742 | 27.42 | 5.62 | --- | PASS |
| | | 2440 | 0.17 | 0.62 | 0.2742 | 27.42 | 5.62 | --- | PASS |
| | | 2480 | 0.17 | 0.62 | 0.2742 | 27.42 | 5.62 | --- | PASS |

## Test Graphs

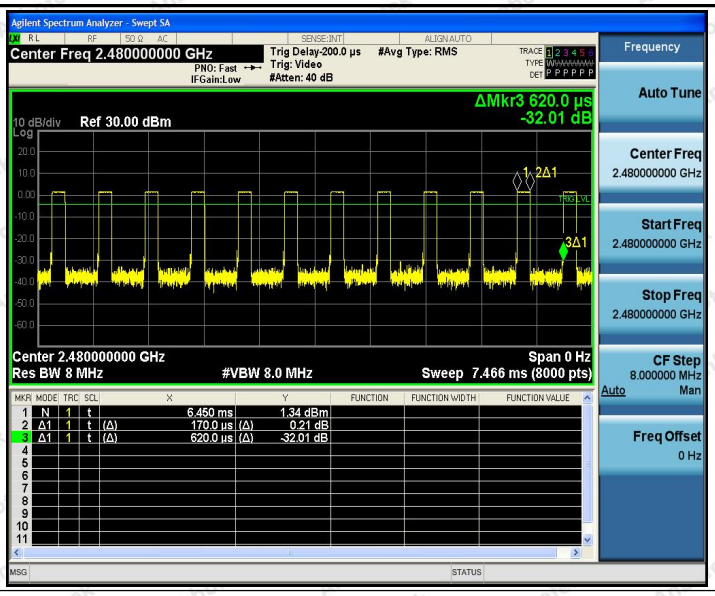
BLE_1M_Ant1_2402




BLE_1M_Ant1_2440




BLE_1M_Ant1_2480


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Fast
IFGain:Low
Trig Delay-200.0 µs
Trig: Video
#Atten: 40 dB
#Avg Type: RMS
ΔMkr3 620.0 µs
-32.01 dB
10 dB/div
Ref 30.00 dBm
Center 2.480000000 GHz
Res BW 8 MHz
#VBW 8.0 MHz
Span 0 Hz
Sweep 7.466 ms (8000 pts)
1 N 1 t 6.450 ms 1.34 dBm
2 Δ1 1 t (Δ) 170.0 µs (Δ) 0.21 dB
3 Δ1 1 t (Δ) 620.0 µs (Δ) -32.01 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---