# Appendix B

## RF Test Data for BLE (Conducted Measurement)

**Product Name: Mini PC**

**Test Model: CK10**

**Environmental Conditions**

| | |
|---|---|
| Temperature: | 22.3° C |
| Relative Humidity: | 53.1% |
| ATM Pressure: | 100.0 kPa |
| Test Engineer: | Kay Hu |
| Supervised by: | Li Huan |

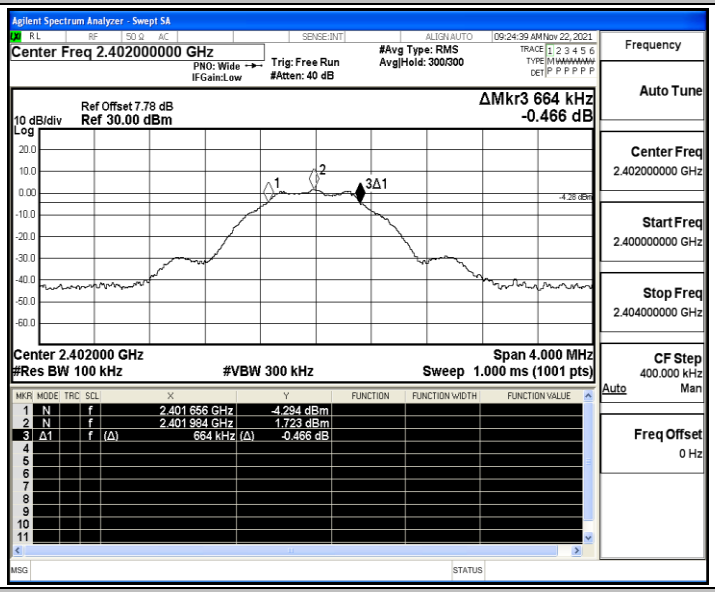
# B.1 6dB Bandwidth

## Test Result

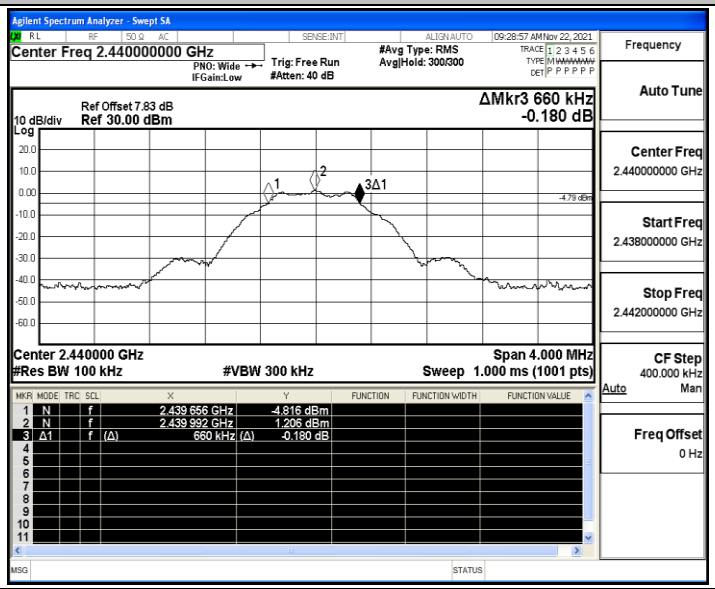
| TestMode | Antenna | Channel | DTS BW [MHz] | FL[MHz] | FH[MHz] | Limit[MHz] | Verdict |
|---|---|---|---|---|---|---|---|
| BLE | Ant0 | 2402 | 0.664 | 2401.656 | 2402.320 | ≥0.5 | PASS |
| | | 2440 | 0.660 | 2439.656 | 2440.316 | ≥0.5 | PASS |
| | | 2480 | 0.664 | 2479.656 | 2480.320 | ≥0.5 | PASS |

## Test Graphs

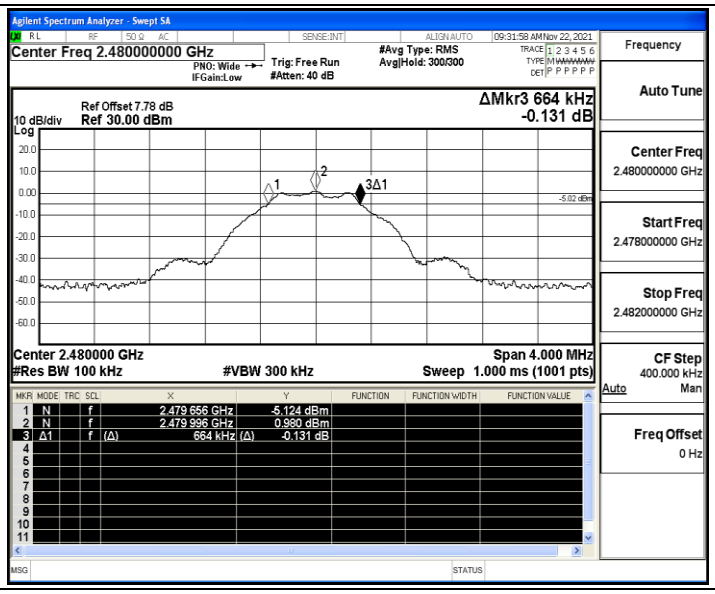
BLE_Ant0_2402




BLE_Ant0_2440




BLE_Ant0_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: 300/300
09:31:58 AM Nov 22, 2021
Ref Offset 7.78 dB
10 dB/div
Log
Ref 30.00 dBm
ΔMkr3 664 kHz
-0.131 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 2.479 656 GHz -5.124 dBm
2 N 1 f 2.479 996 GHz 0.980 dBm
3 Δ1 1 f (Δ) 664 kHz (Δ) -0.131 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

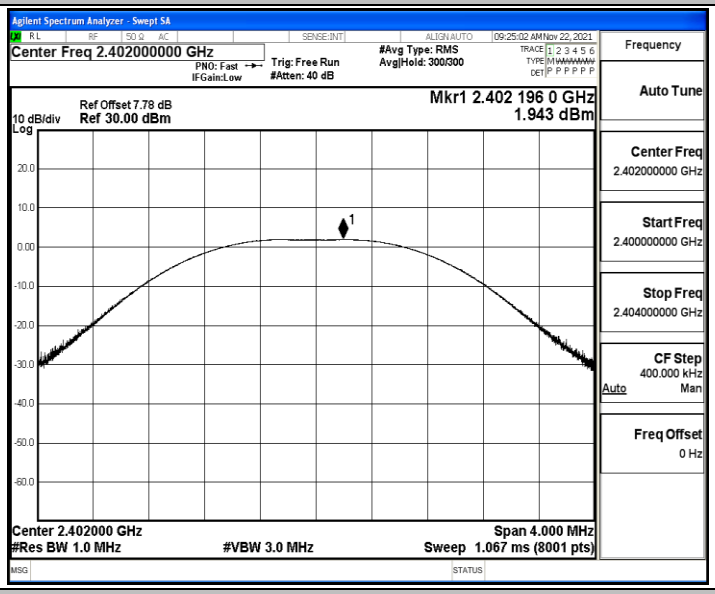
# B.2 Maximum conducted output power

## Test Result

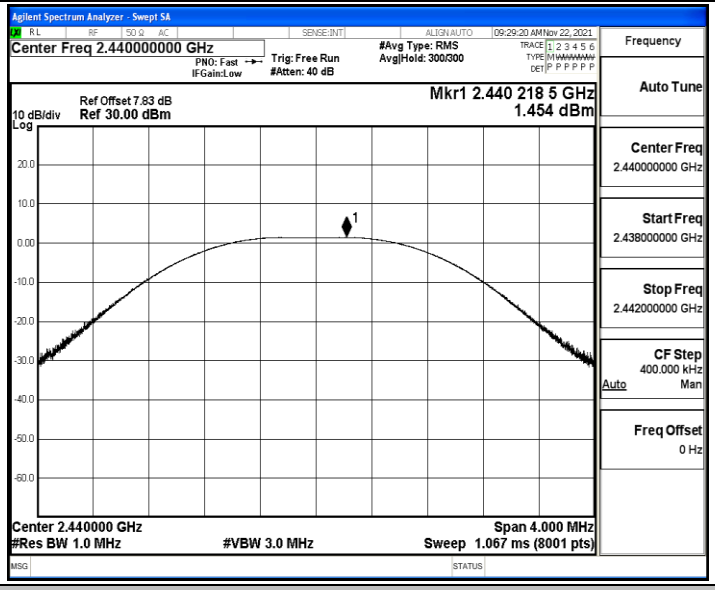
| TestMode | Antenna | Channel | Result[dBm] | Limit[dBm] | Verdict |
|---|---|---|---|---|---|
| BLE | Ant0 | 2402 | 1.94 | ≤30 | PASS |
| | | 2440 | 1.45 | ≤30 | PASS |
| | | 2480 | 1.17 | ≤30 | PASS |

## Test Graphs

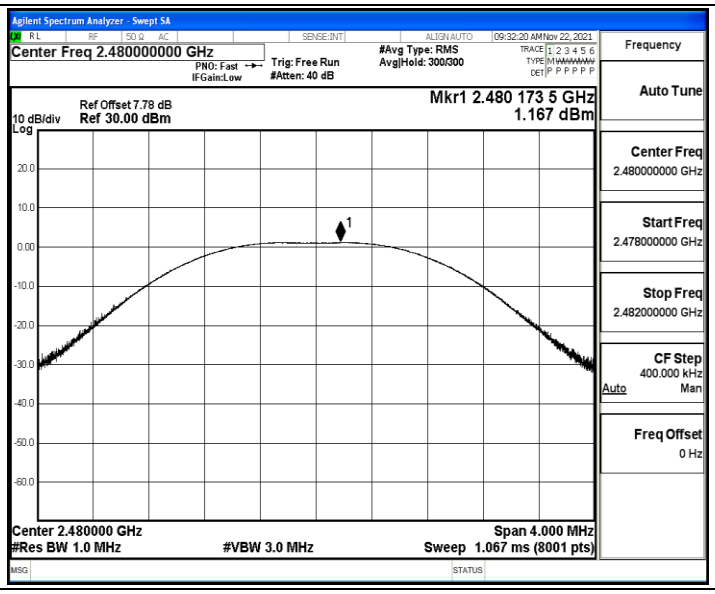
BLE_Ant0_2402




BLE_Ant0_2440




BLE_Ant0_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: 300/300
09:32:20 AM Nov 22, 2021
Frequency
Auto Tune
Mkr1 2.480 173 5 GHz
1.167 dBm
Ref Offset 7.78 dB
10 dB/div
Log
Ref 30.00 dBm
20.0
10.0
0.00
-10.0
-20.0
-30.0
-40.0
-50.0
-60.0
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
Center 2.480000 GHz
#Res BW 1.0 MHz
#VBW 3.0 MHz
Span 4.000 MHz
Sweep 1.067 ms (8001 pts)
MSG
STATUS

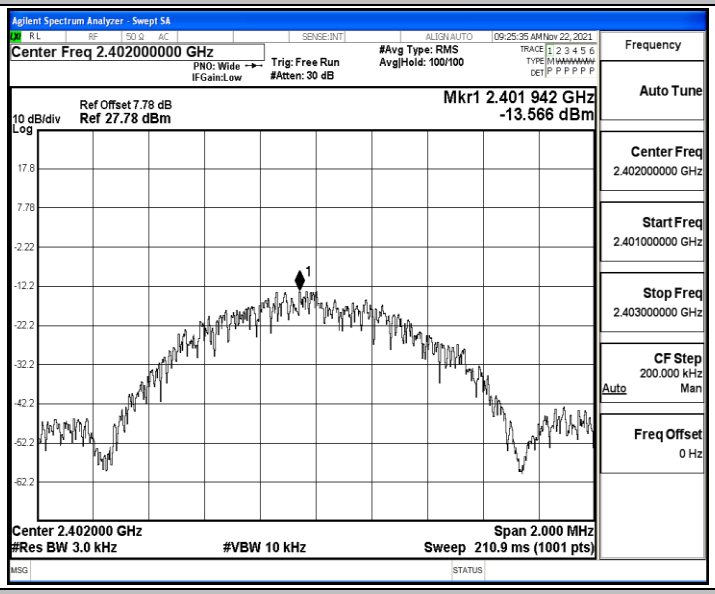
# B.3 Maximum power spectral density

## Test Result

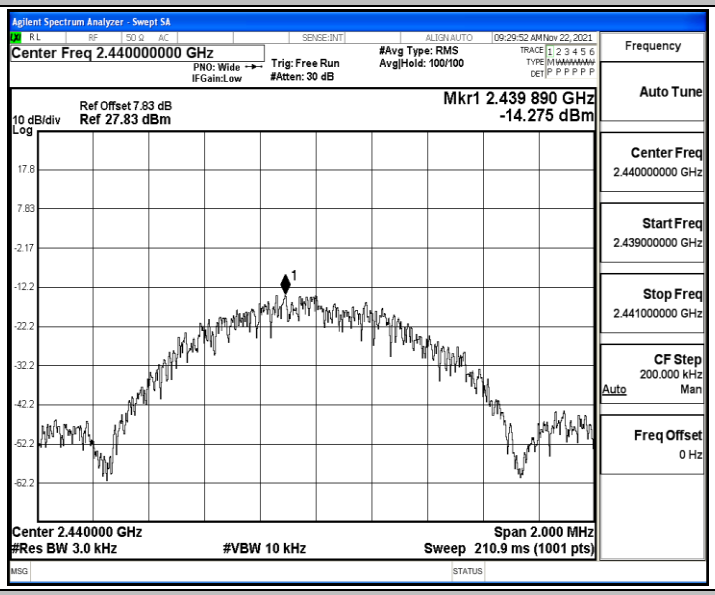
| TestMode | Antenna | Channel | Result[dBm/3kHz] | Limit[dBm/3kHz] | Verdict |
|---|---|---|---|---|---|
| BLE | Ant0 | 2402 | -13.57 | ≤8 | PASS |
| | | 2440 | -14.28 | ≤8 | PASS |
| | | 2480 | -14.02 | ≤8 | PASS |

## Test Graphs

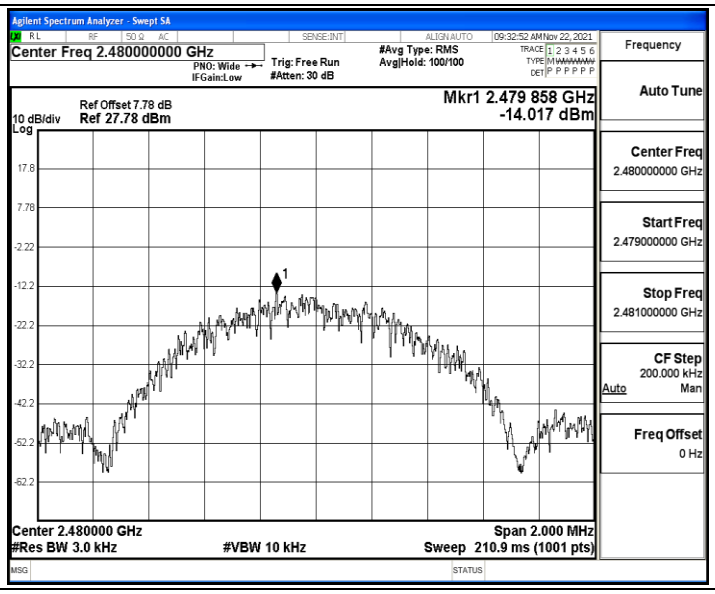
BLE_Ant0_2402




BLE_Ant0_2440




BLE_Ant0_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: 100/100
09:32:52 AM Nov 22, 2021
Ref Offset 7.78 dB
10 dB/div
Log
Ref 27.78 dBm
Mkr1 2.479 858 GHz
-14.017 dBm
17.8
7.78
-2.22
-12.2
-22.2
-32.2
-42.2
-52.2
-62.2
Center 2.480000 GHz
#Res BW 3.0 kHz
#VBW 10 kHz
Span 2.000 MHz
Sweep 210.9 ms (1001 pts)
Frequency
Auto Tune
Center Freq
2.480000000 GHz
Start Freq
2.479000000 GHz
Stop Freq
2.481000000 GHz
CF Step
200.000 kHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

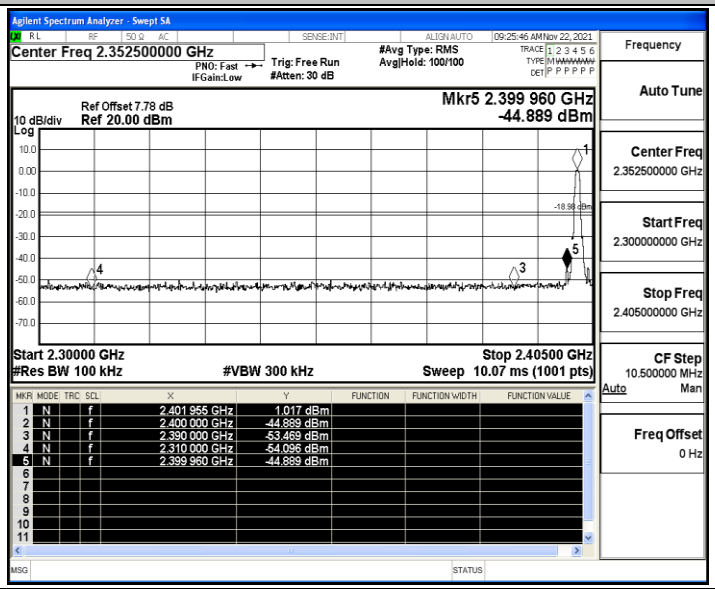
# B.4 Band edge measurements

## Test Result

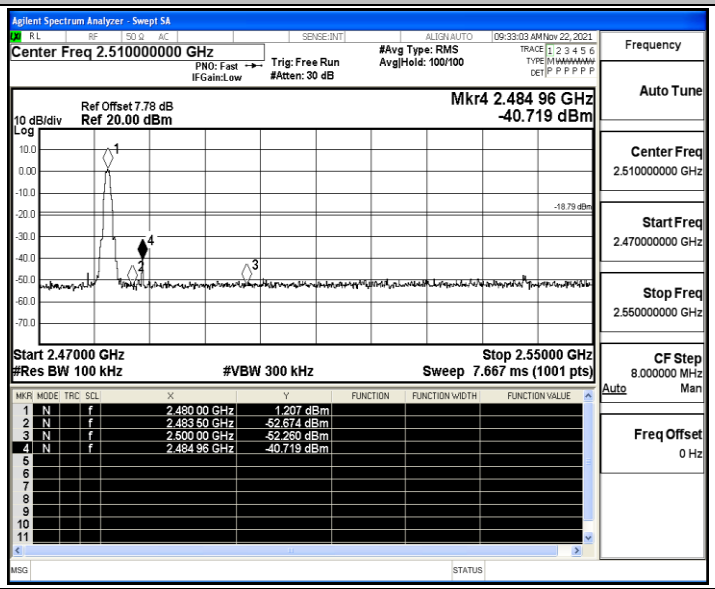
| TestMode | Antenna | ChName | Channel | RefLevel[dBm] | Result[dBm] | Limit[dBm] | Verdict |
|---|---|---|---|---|---|---|---|
| BLE | Ant0 | Low | 2402 | 1.02 | -44.89 | ≤-18.98 | PASS |
| | | High | 2480 | 1.21 | -40.72 | ≤-18.79 | PASS |

## Test Graphs

BLE_Ant0_Low_2402




BLE_Ant0_High_2480



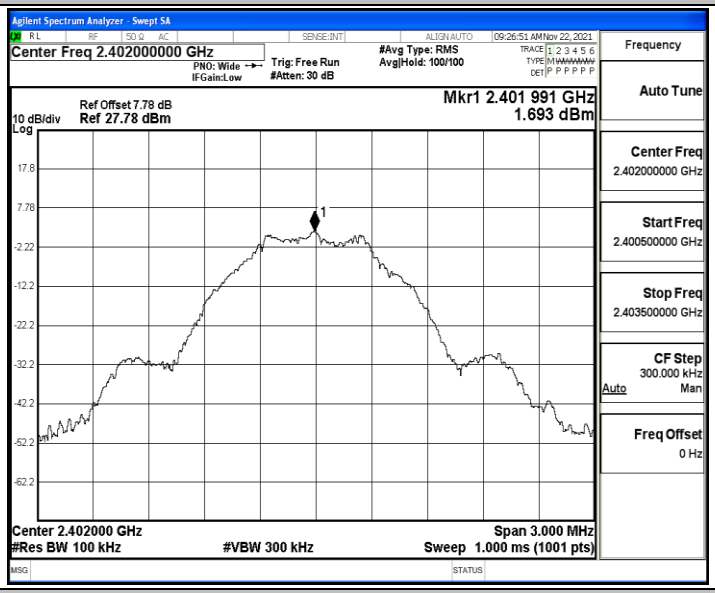
# B.5 Conducted Spurious Emission

## Test Result

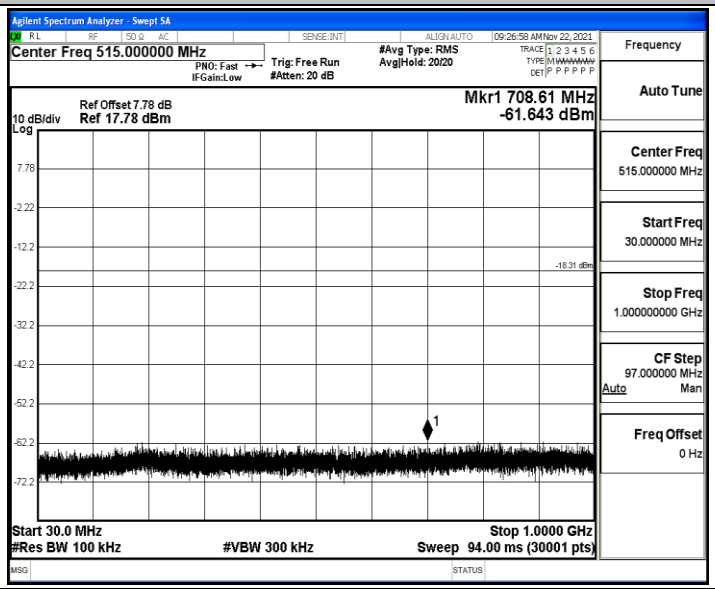
| TestMode | Antenna | Channel | FreqRange [MHz] | RefLevel [dBm] | Result[dBm] | Limit[dBm] | Verdict |
|---|---|---|---|---|---|---|---|
| BLE | Ant0 | 2402 | Reference | 1.69 | 1.69 | --- | PASS |
| | | | 30~1000 | 1.69 | -61.64 | ≤-18.31 | PASS |
| | | | 1000~26500 | 1.69 | -47.54 | ≤-18.31 | PASS |
| | | 2440 | Reference | 1.19 | 1.19 | --- | PASS |
| | | | 30~1000 | 1.19 | -61.76 | ≤-18.81 | PASS |
| | | | 1000~26500 | 1.19 | -47.27 | ≤-18.81 | PASS |
| | | 2480 | Reference | 0.96 | 0.96 | --- | PASS |
| | | | 30~1000 | 0.96 | -61.44 | ≤-19.04 | PASS |
| | | | 1000~26500 | 0.96 | -47.2 | ≤-19.04 | PASS |

## Test Graphs

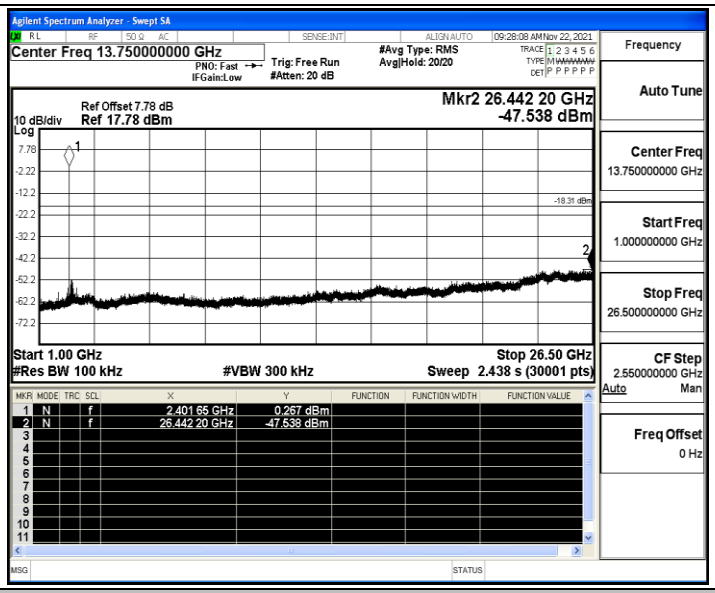
BLE_Ant0_2402_0~Reference



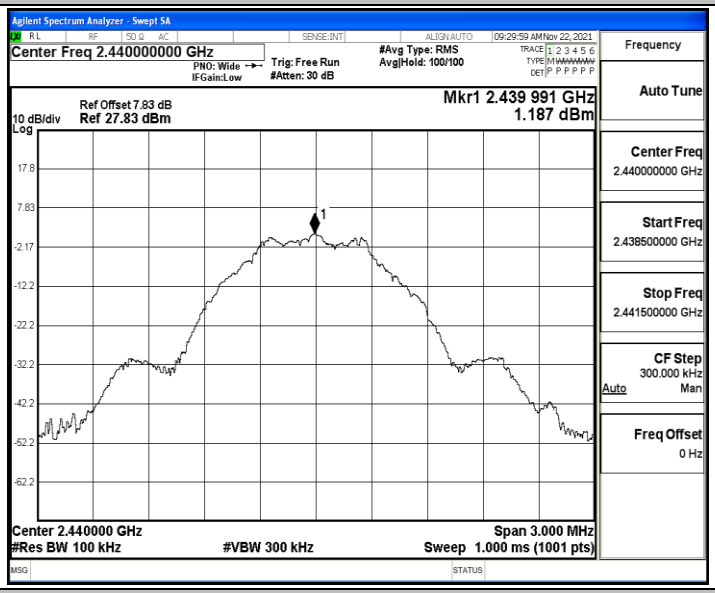

BLE_Ant0_2402_30~1000



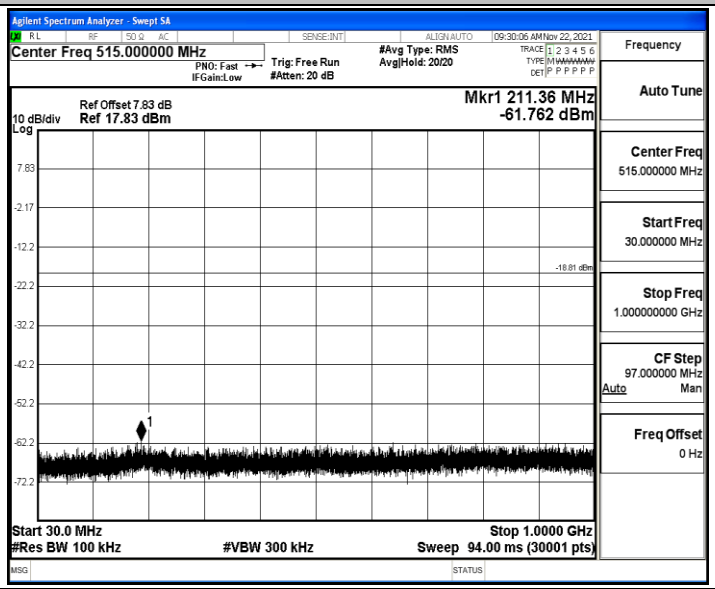

BLE_Ant0_2402_1000~26500

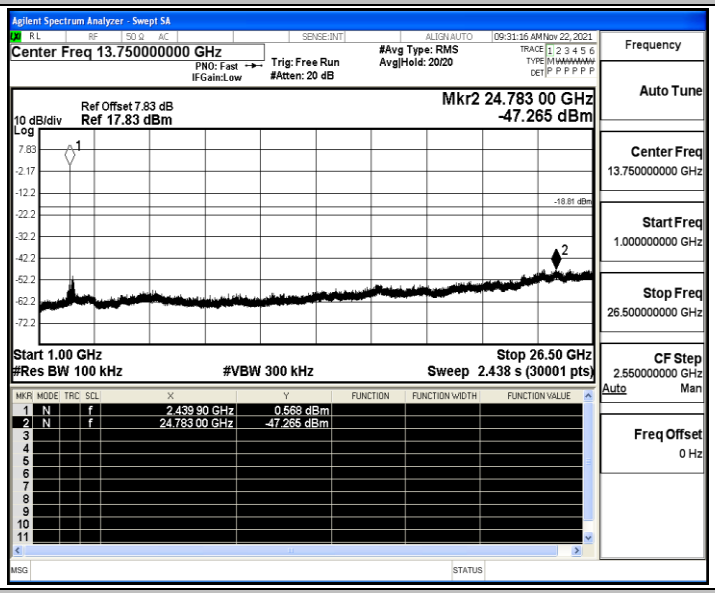
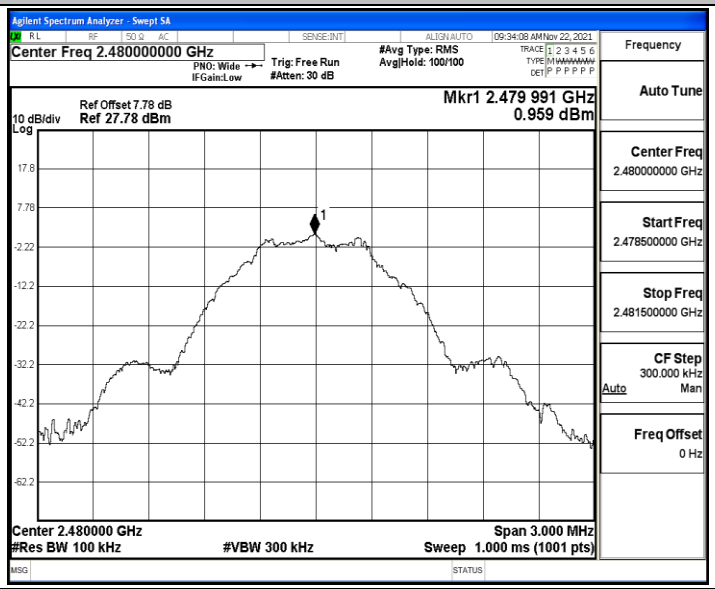


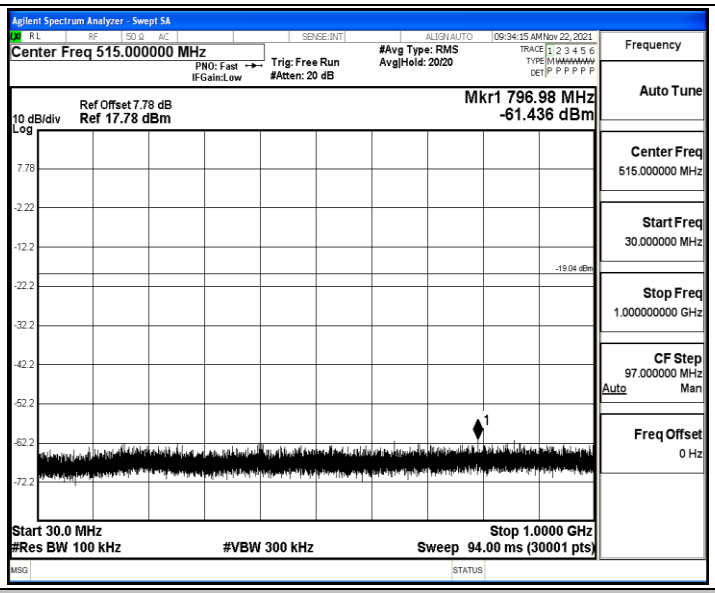

BLE_Ant0_2440_0~Reference



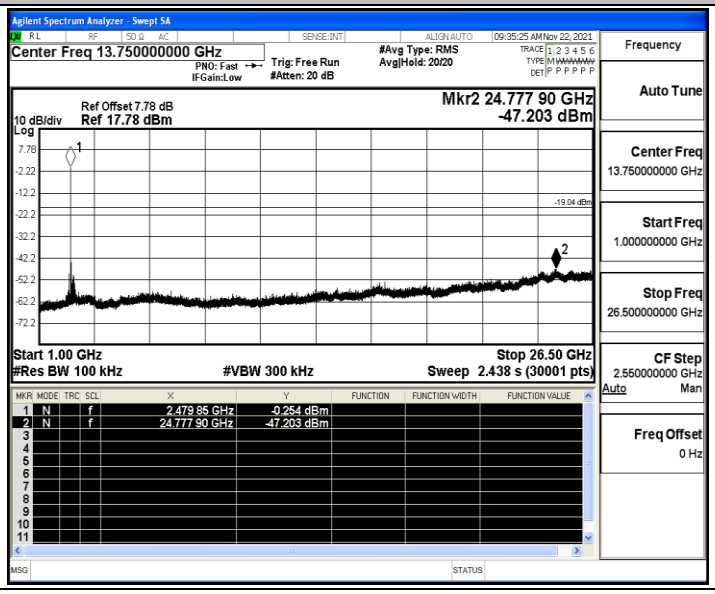

BLE_Ant0_2440_30~1000



| BLE_Ant0_2440_1000~26500 |
| --- |
|  |
| BLE_Ant0_2480_0~Reference |
|  |
| BLE_Ant0_2480_30~1000 |




BLE_Ant0_2480_1000~26500



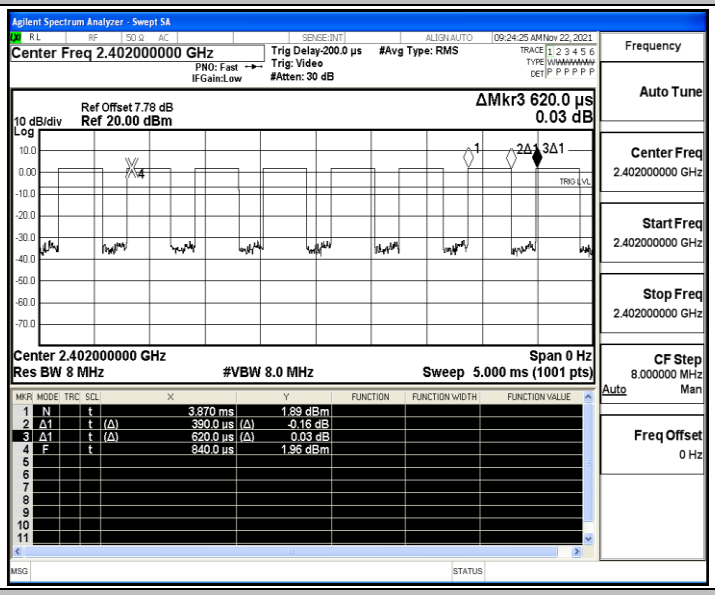
# B.6 Duty Cycle

## Test Result

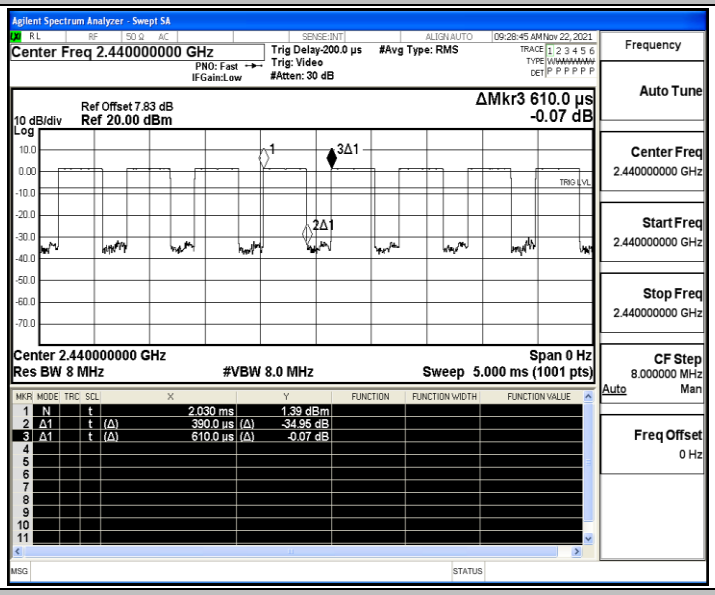
| TestMode | Antenna | Channel | ON Time [ms] | Period [ms] | X | DC [%] | xFactor | Limit | Verdict |
|---|---|---|---|---|---|---|---|---|---|
| BLE | Ant0 | 2402 | 0.39 | 0.62 | 0.6290 | 62.90 | 2.01 | --- | PASS |
| | | 2440 | 0.39 | 0.61 | 0.6393 | 63.93 | 1.94 | --- | PASS |
| | | 2480 | 0.39 | 0.62 | 0.6290 | 62.90 | 2.01 | --- | PASS |

## Test Graphs

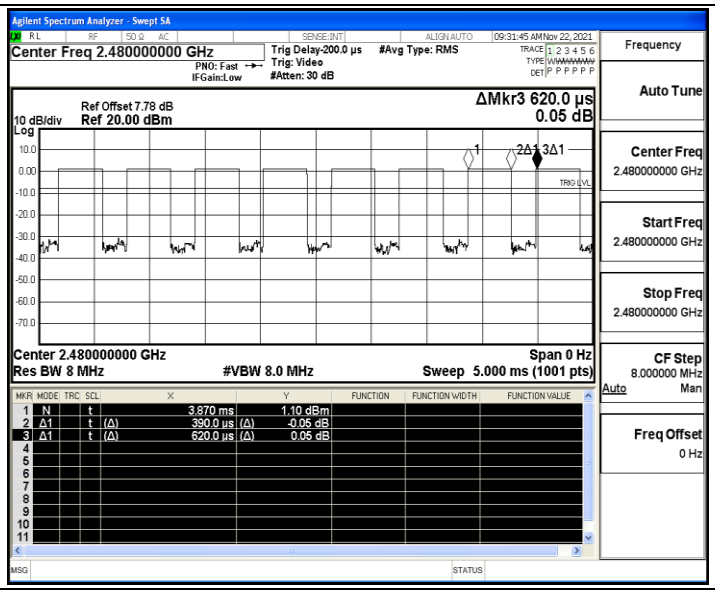
BLE_Ant0_2402




BLE_Ant0_2440




BLE_Ant0_2480


Agilent Spectrum Analyzer - Swept SA
Center Freq 2.480000000 GHz
PNO: Fast
IFGain:Low
Trig Delay-200.0 µs
Trig: Video
#Atten: 30 dB
#Avg Type: RMS
09:31:45 AM Nov 22, 2021
Ref Offset 7.78 dB
10 dB/div
Log
Ref 20.00 dBm
ΔMkr3 620.0 µs
0.05 dB
Center 2.480000000 GHz
Res BW 8 MHz
#VBW 8.0 MHz
Span 0 Hz
Sweep 5.000 ms (1001 pts)
1 N 1 t 3.870 ms 1.10 dBm
2 Δ1 t (Δ) 390.0 µs (Δ) -0.05 dB
3 Δ1 t (Δ) 620.0 µs (Δ) 0.05 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

# B.7 Emissions in Restricted Bands

## Test Result

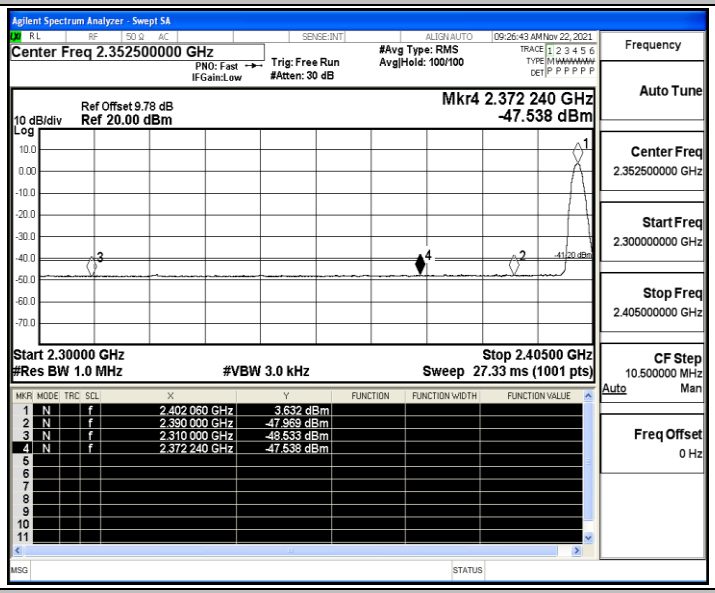
| TestMode | Channel | Detector | Freq. [MHz] | Result [dBm] | Limit [dBm] | Result [dBuV/m] | Limit [dBuV/m] | Verdict |
|---|---|---|---|---|---|---|---|---|
| BLE | 2402 | AV | 2310.000 | -48.53 | ≤-41.20 | 46.67 | ≤54 | PASS |
| | | AV | 2372.240 | -47.54 | ≤-41.20 | 47.66 | ≤54 | PASS |
| | | AV | 2390.000 | -47.97 | ≤-41.20 | 47.23 | ≤54 | PASS |
| | | Peak | 2310.000 | -43.26 | ≤-21.20 | 51.94 | ≤74 | PASS |
| | | Peak | 2347.670 | -38.78 | ≤-21.20 | 56.42 | ≤74 | PASS |
| | | Peak | 2390.000 | -40.74 | ≤-21.20 | 54.46 | ≤74 | PASS |
| | 2480 | AV | 2483.500 | -46.8 | ≤-41.20 | 48.40 | ≤54 | PASS |
| | | AV | 2484.880 | -42.92 | ≤-41.20 | 52.28 | ≤54 | PASS |
| | | AV | 2500.000 | -47.37 | ≤-41.20 | 47.83 | ≤54 | PASS |
| | | Peak | 2483.500 | -40.82 | ≤-21.20 | 54.38 | ≤74 | PASS |
| | | Peak | 2485.120 | -38.19 | ≤-21.20 | 57.01 | ≤74 | PASS |
| | | Peak | 2500.000 | -40.84 | ≤-21.20 | 54.36 | ≤74 | PASS |

Note：

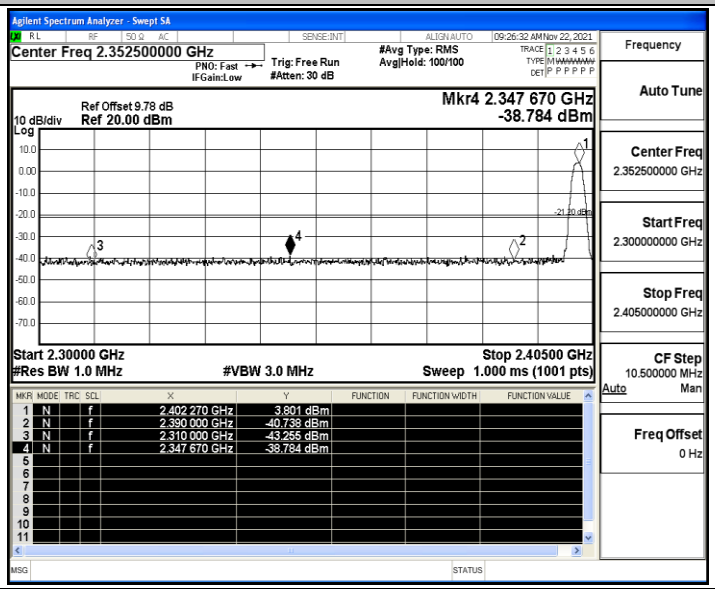
1. The Antenna Gain is compensated in the graph.
2. The limit in dBm for average detector is conversion from 54dBuV/m, according to 15.209(a). The limit in dBm for peak detector is 20dB above the limit of average detector in dBm.

## Test Graphs

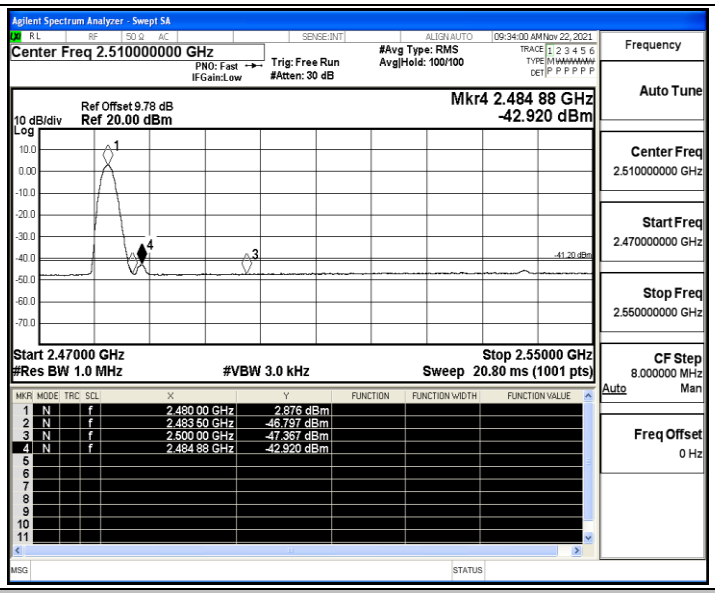
BLE_Ant0_Low_2402_AV




BLE_Ant0_Low_2402_Peak




BLE_Ant0_High_2480_AV




BLE_Ant0_High_2480_Peak