# Appendix A

## RF Test Data for BT LE (Conducted Measurement)

**Product Name: Promagnus**

**Test Model: Promagnus**

**Environmental Conditions**

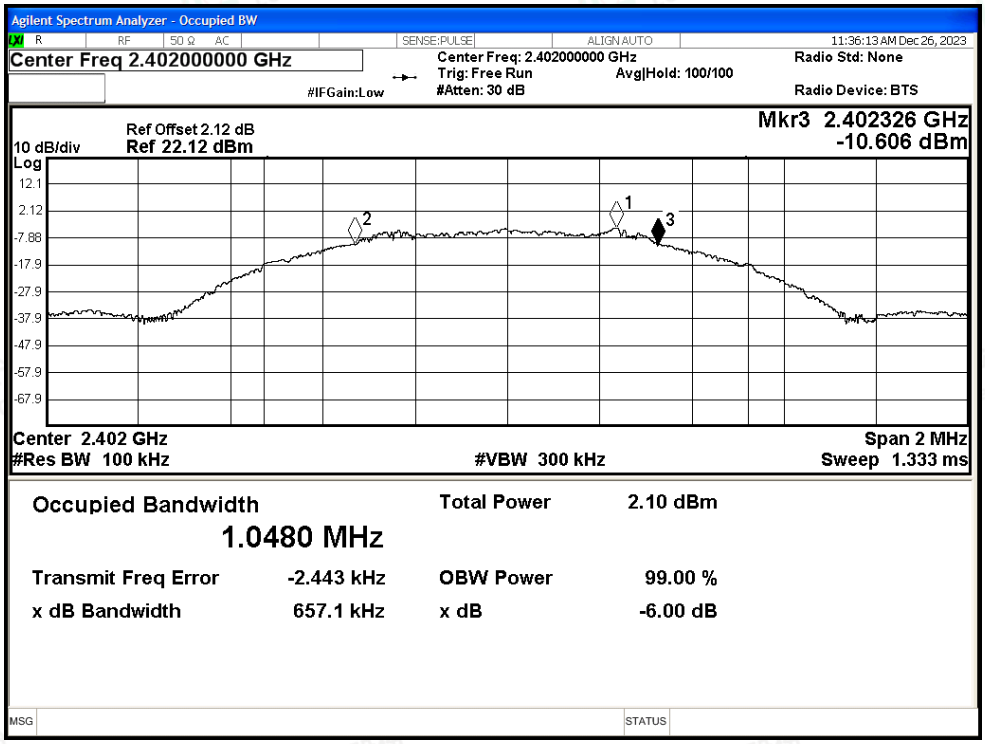
| | |
|---|---|
| Temperature: | 23.8° C |
| Relative Humidity: | 52.1% |
| ATM Pressure: | 100.0 kPa |
| Test Engineer: | Paddi Chen |
| Supervised by: | Nick Peng |

# A.1 -6dB Bandwidth

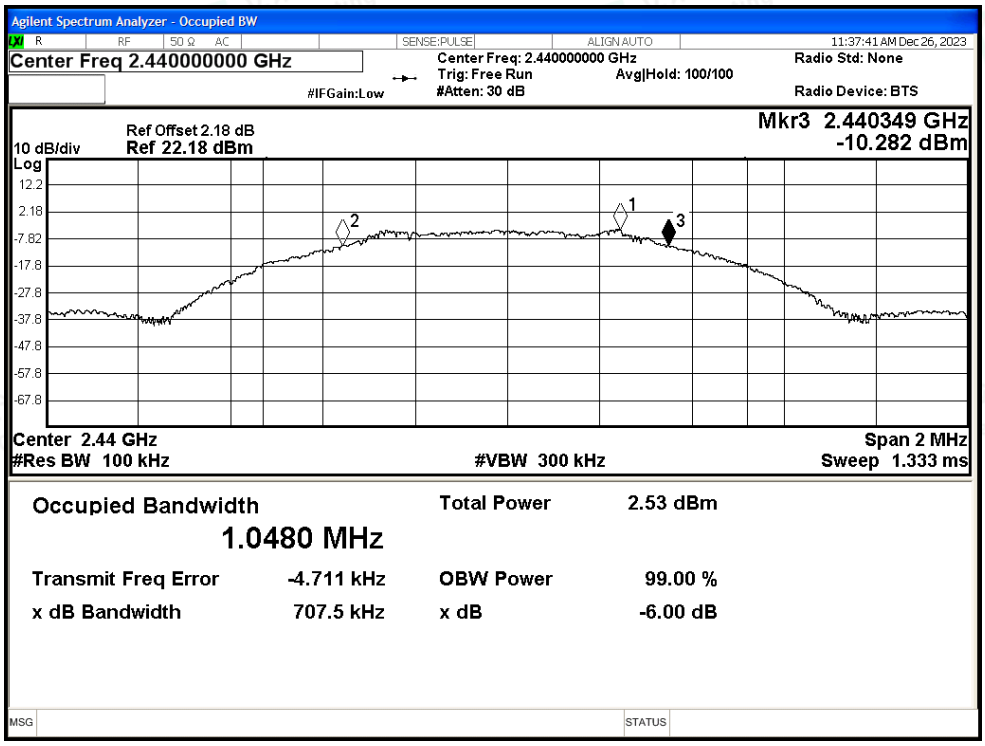
| Condition | Mode | Frequency (MHz) | Antenna | -6 dB Bandwidth (MHz) | Limit -6 dB Bandwidth (MHz) | Verdict |
|---|---|---|---|---|---|---|
| NVNT | BLE | 2402 | Ant | 0.657 | >=0.5 | Pass |
| NVNT | BLE | 2440 | Ant | 0.708 | >=0.5 | Pass |
| NVNT | BLE | 2480 | Ant | 0.682 | >=0.5 | Pass |

Test Graphs

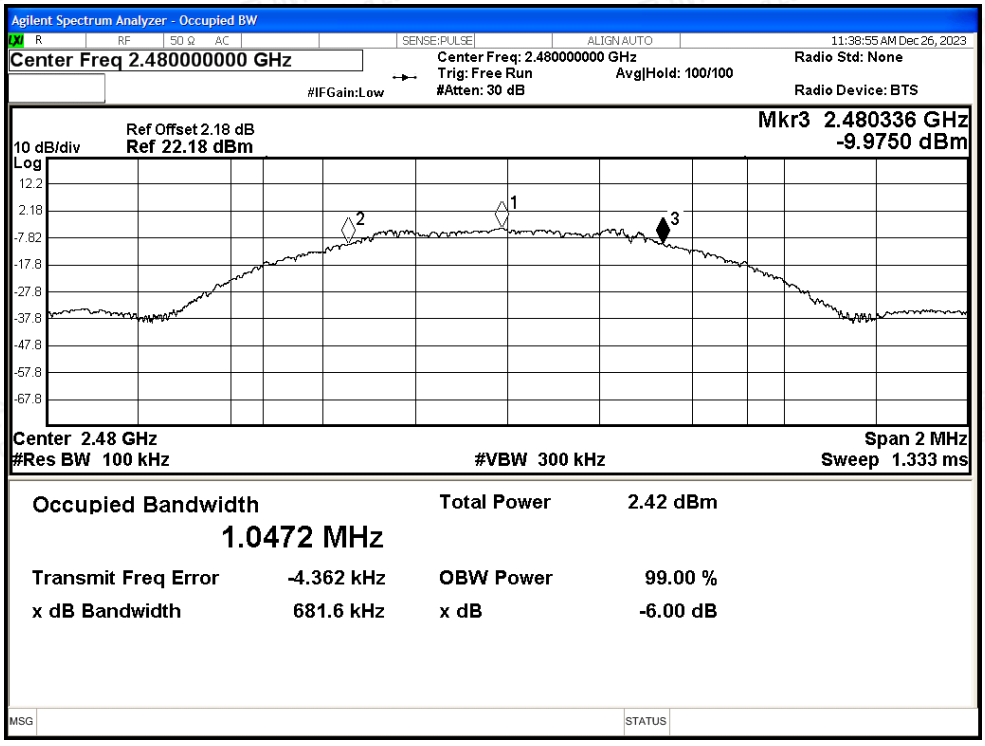
-6dB Bandwidth NVNT BLE 2402MHz Ant




-6dB Bandwidth NVNT BLE 2440MHz Ant



-6dB Bandwidth NVNT BLE 2480MHz Ant

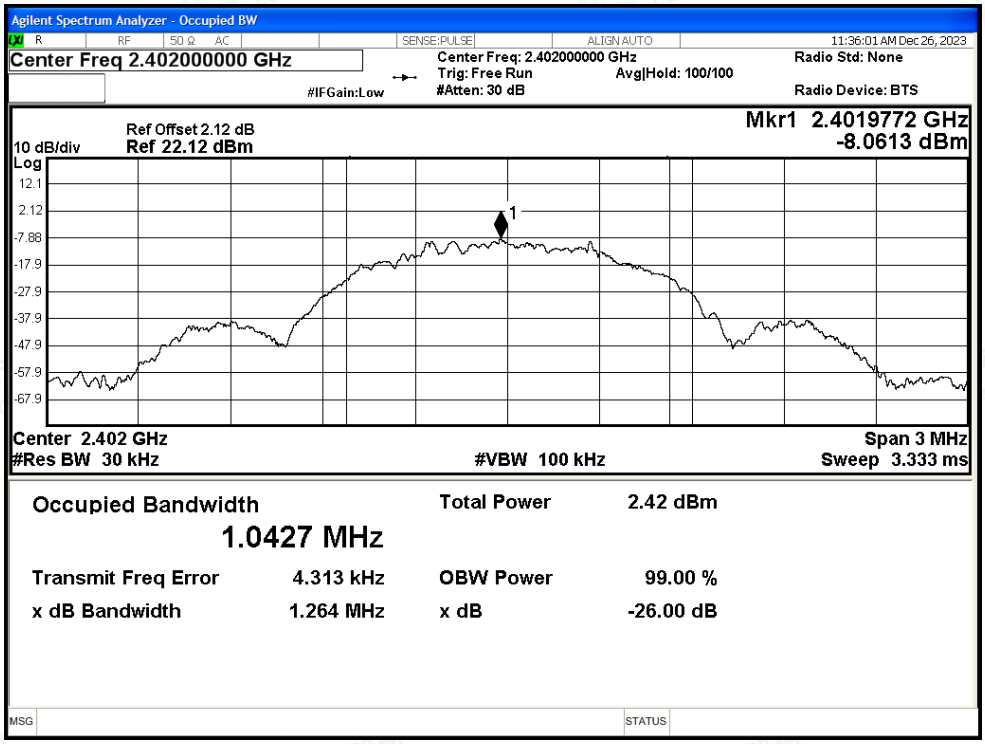


# A.2 Occupied Channel Bandwidth

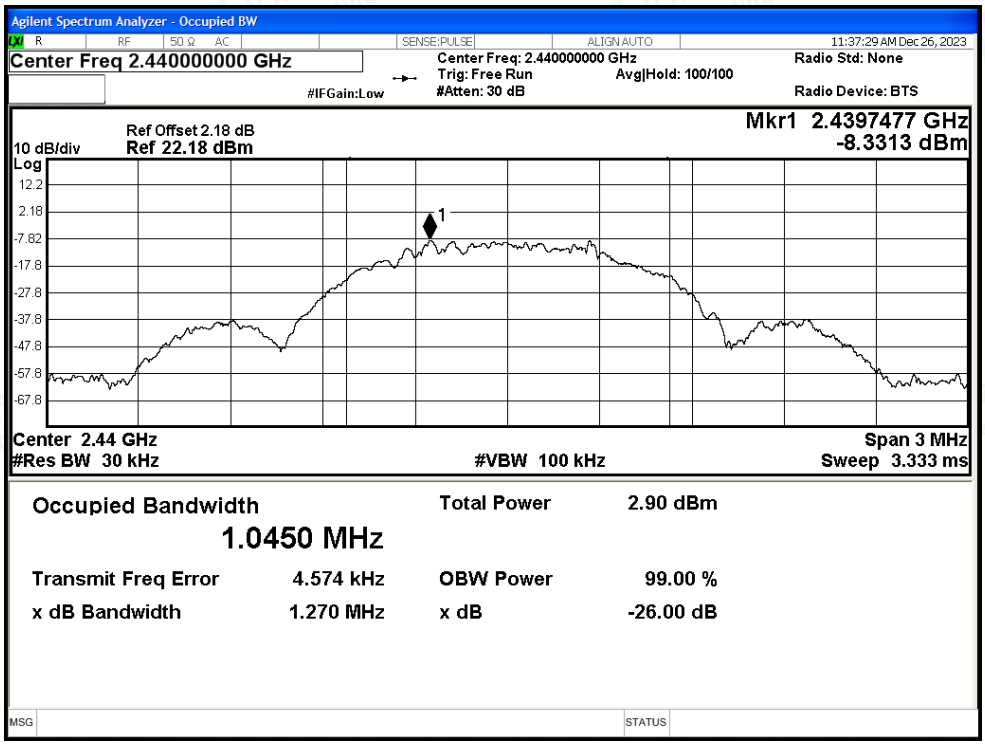
| Condition | Mode | Frequency (MHz) | Antenna | 99% OBW (MHz) |
|---|---|---|---|---|
| NVNT | BLE | 2402 | Ant | 1.043 |
| NVNT | BLE | 2440 | Ant | 1.045 |
| NVNT | BLE | 2480 | Ant | 1.037 |

Test Graphs

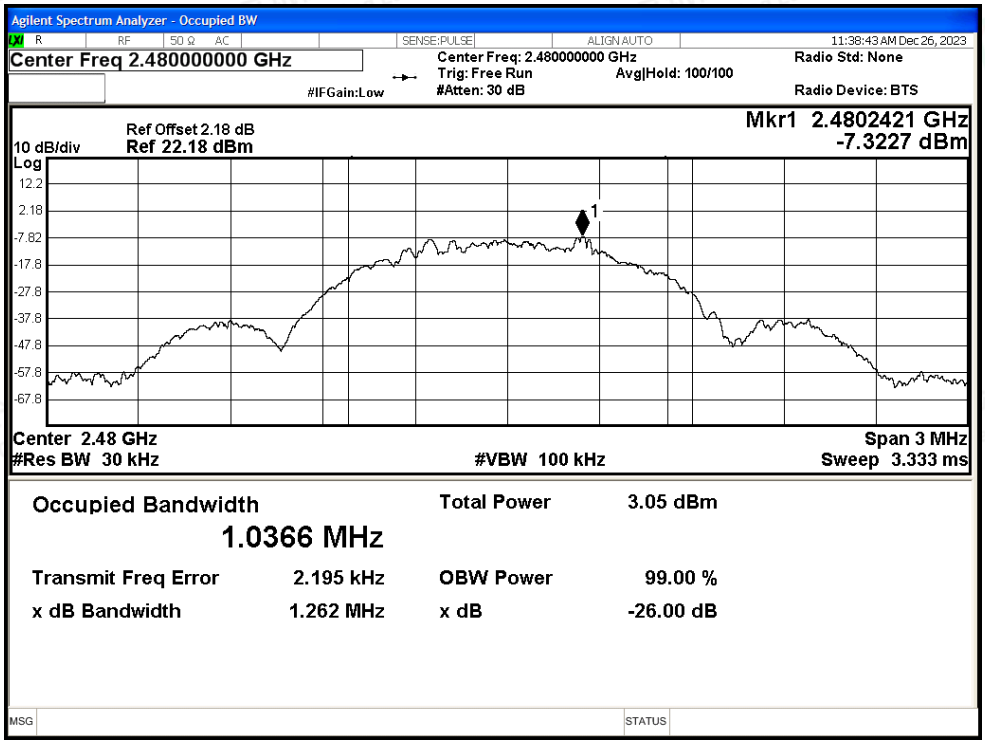
OBW NVNT BLE 2402MHz Ant




OBW NVNT BLE 2440MHz Ant



OBW NVNT BLE 2480MHz Ant

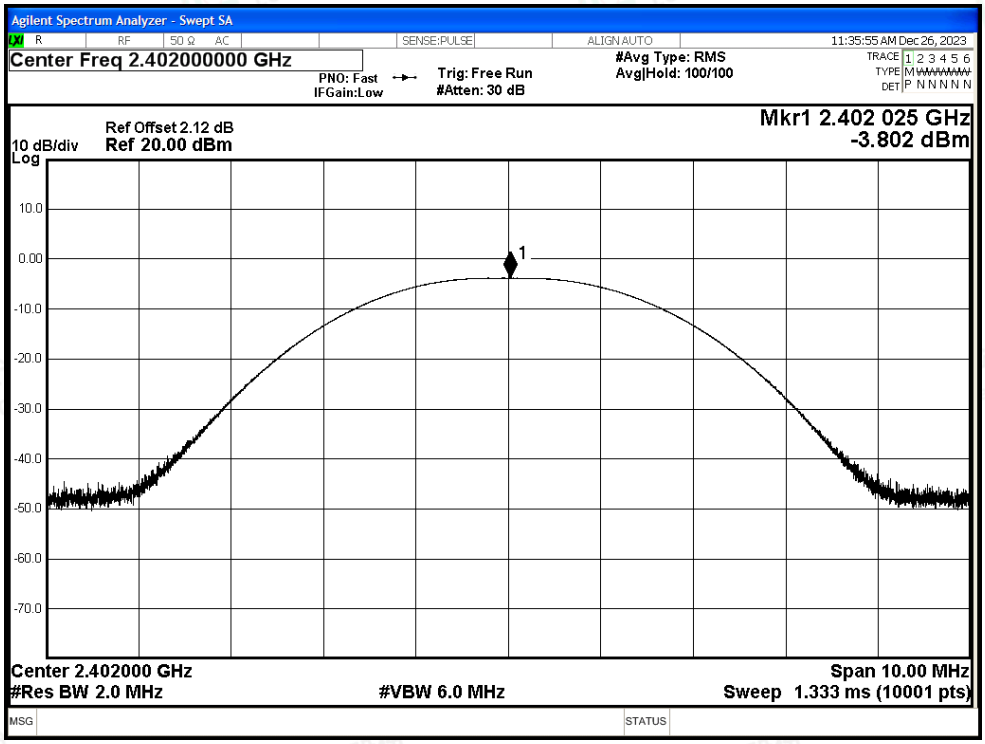


# A.3 Maximum Peak Conducted Output Power

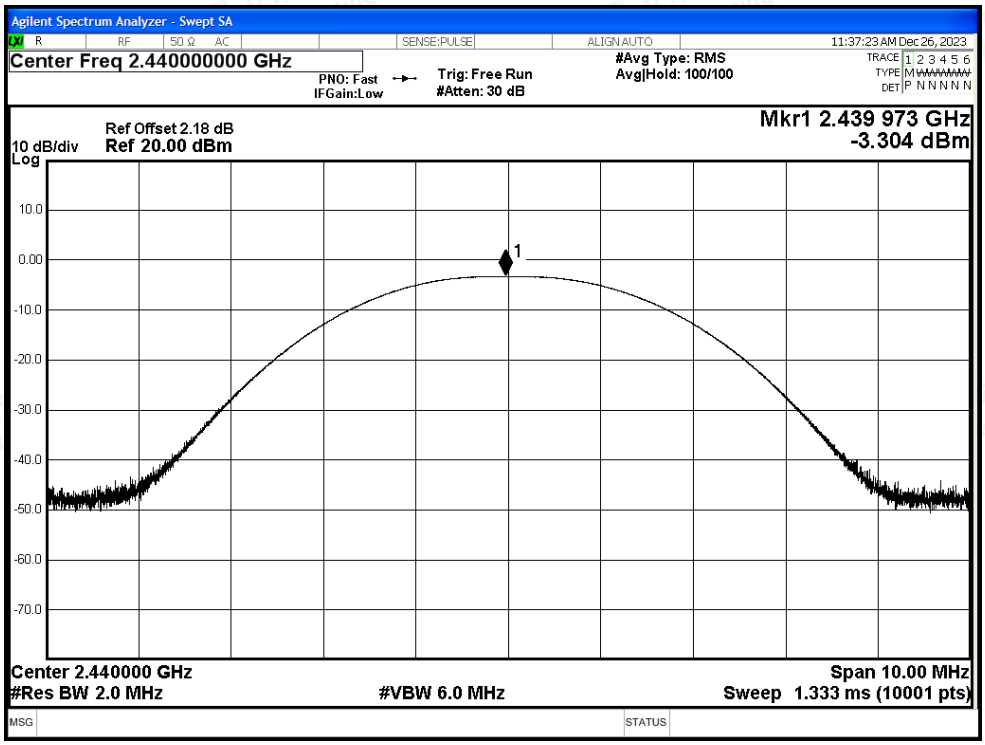
| Condition | Mode | Frequency (MHz) | Antenna | Conducted Power (dBm) | Limit (dBm) | Verdict |
|---|---|---|---|---|---|---|
| NVNT | BLE | 2402 | Ant | -3.8 | 30 | Pass |
| NVNT | BLE | 2440 | Ant | -3.3 | 30 | Pass |
| NVNT | BLE | 2480 | Ant | -3.35 | 30 | Pass |

Test Graphs

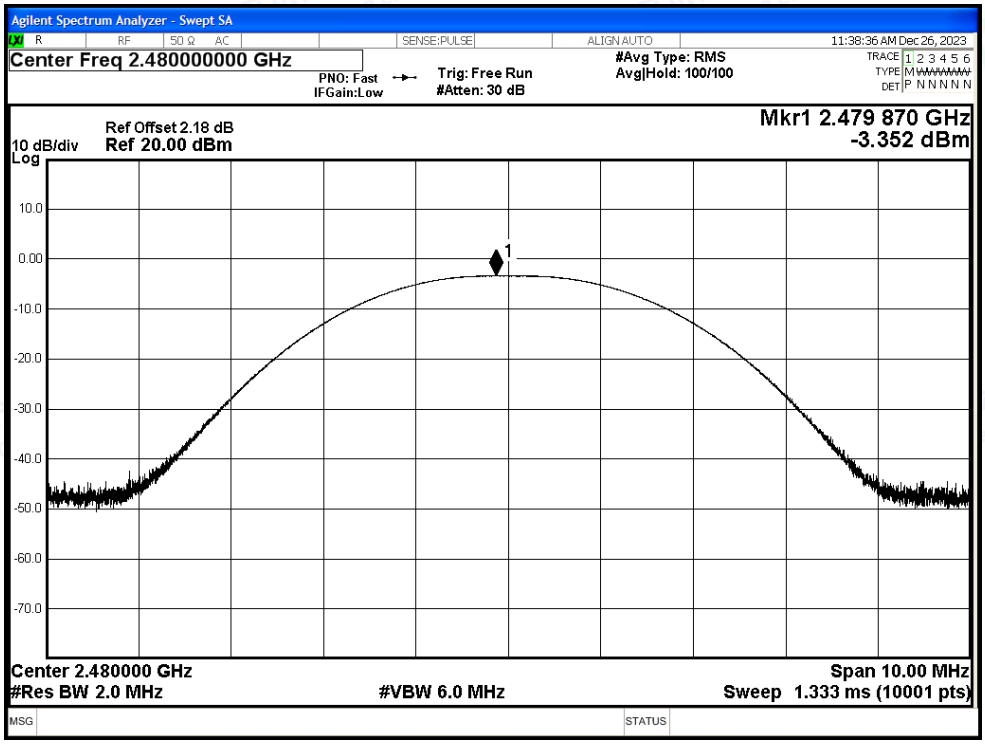
Power NVNT BLE 2402MHz Ant




Power NVNT BLE 2440MHz Ant



Power NVNT BLE 2480MHz Ant

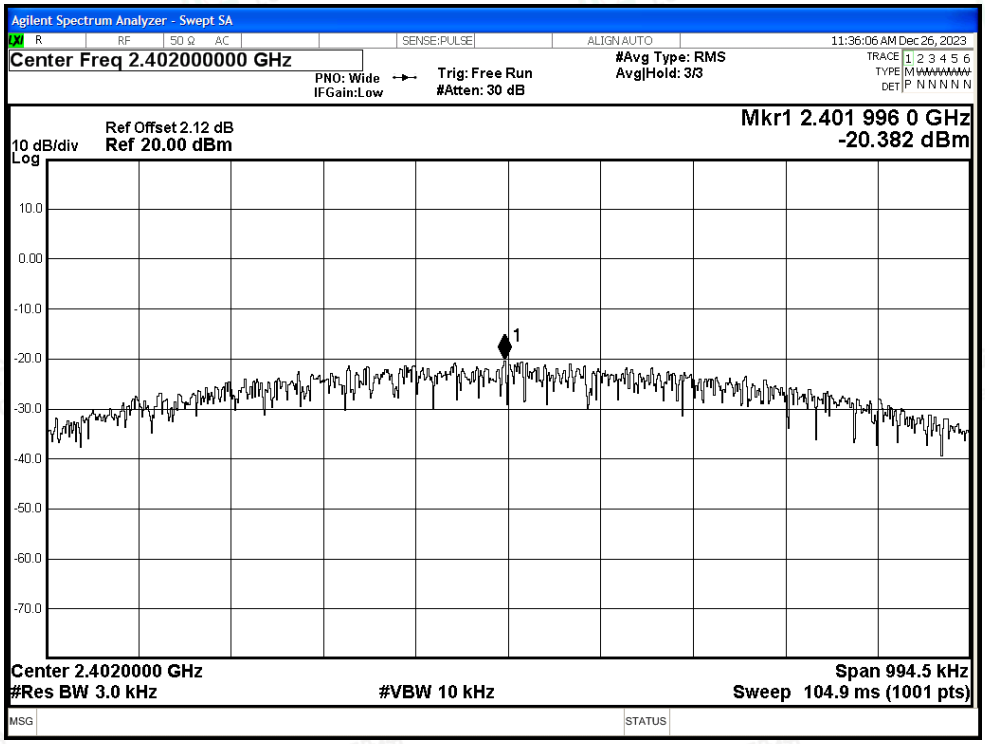


# A.4 Maximum Power Spectral Density Level

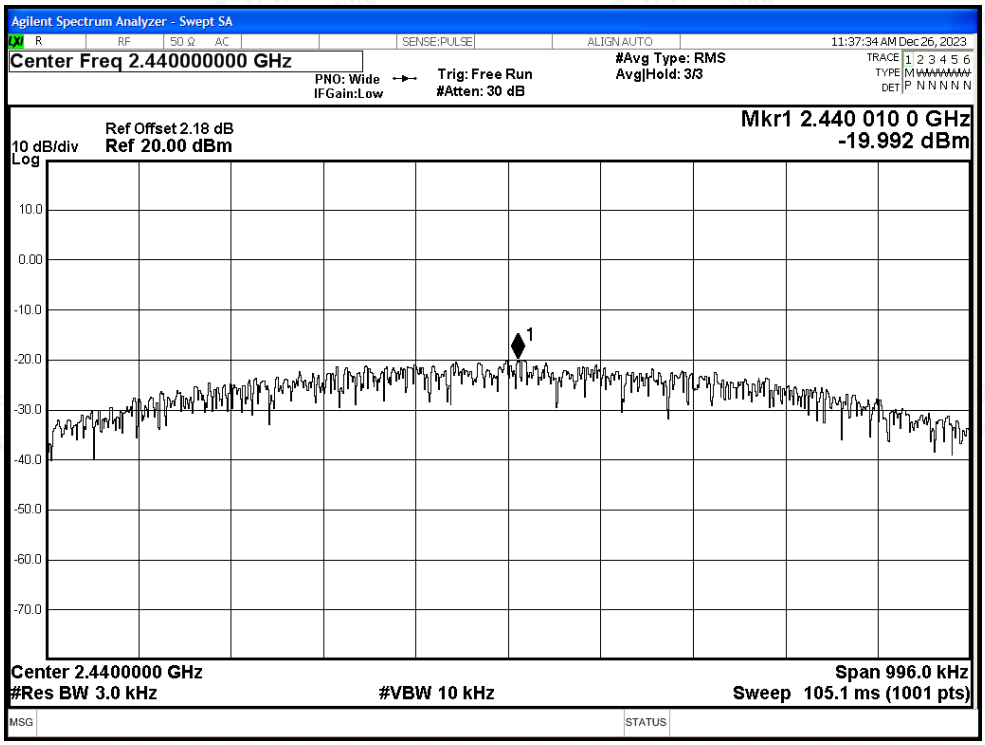
| Condition | Mode | Frequency (MHz) | Antenna | Conducted PSD (dBm/3kHz) | Limit (dBm/3kHz) | Verdict |
|---|---|---|---|---|---|---|
| NVNT | BLE | 2402 | Ant | -20.38 | 8 | Pass |
| NVNT | BLE | 2440 | Ant | -19.99 | 8 | Pass |
| NVNT | BLE | 2480 | Ant | -20.01 | 8 | Pass |

Test Graphs

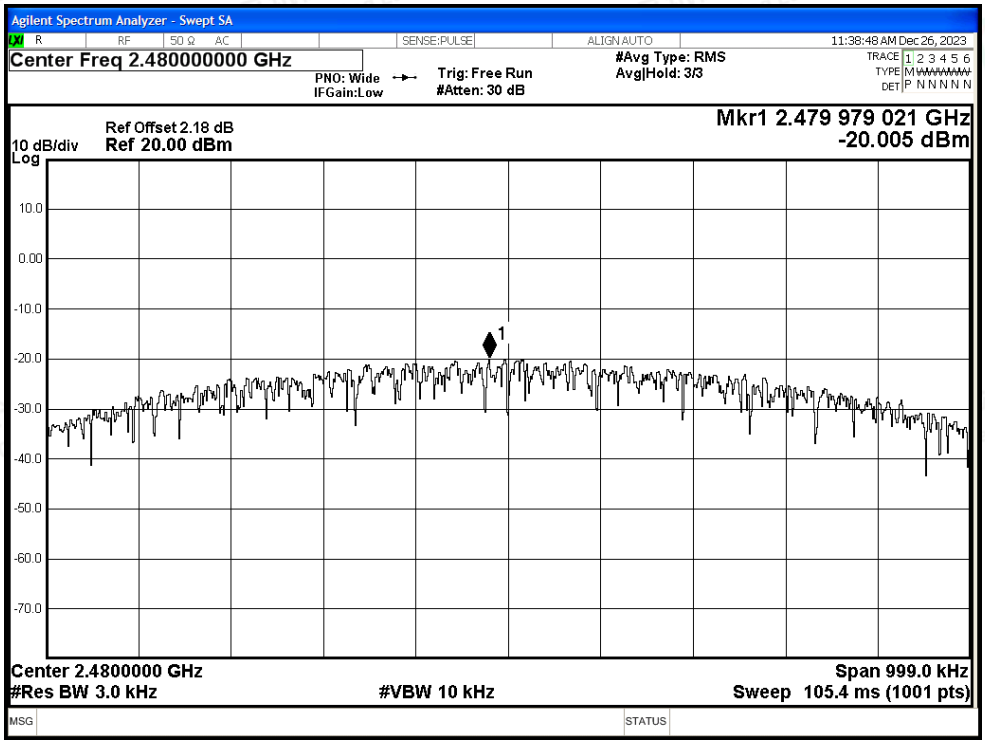
PSD NVNT BLE 2402MHz Ant




PSD NVNT BLE 2440MHz Ant



PSD NVNT BLE 2480MHz Ant

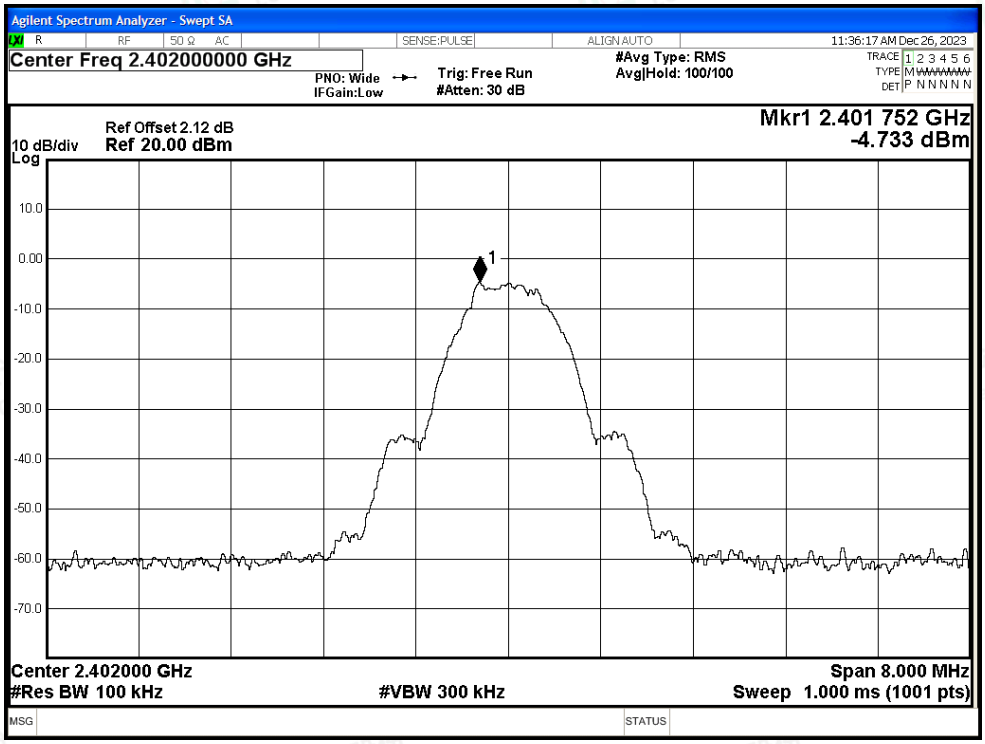


# A.5 Band Edge

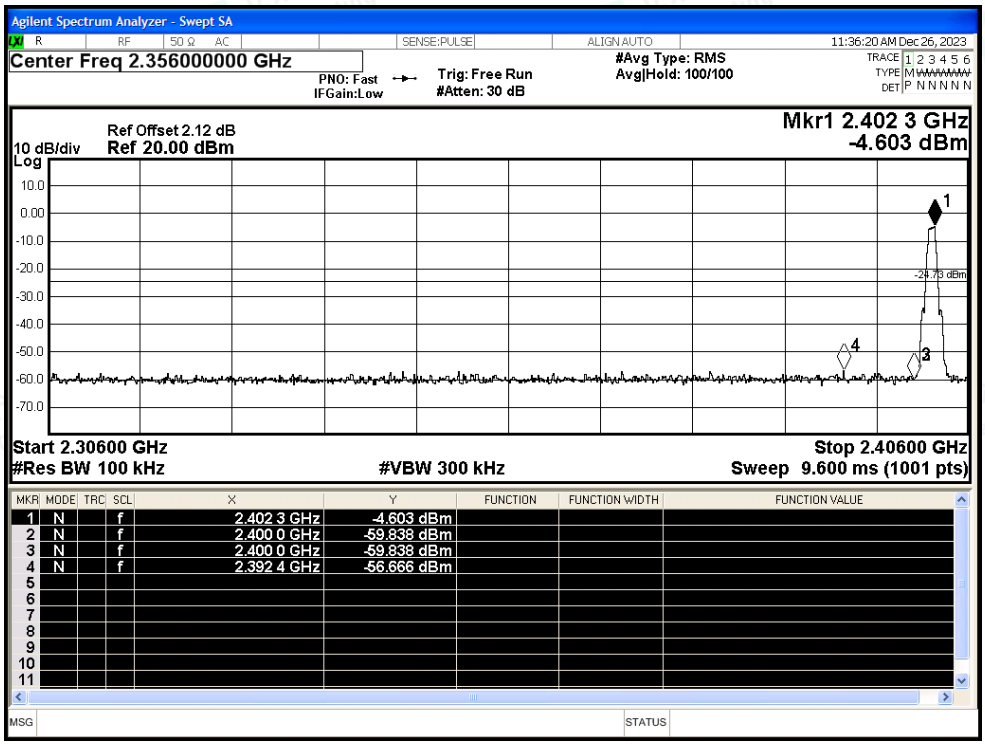
| Condition | Mode | Frequency (MHz) | Antenna | Max Value (dBc) | Limit (dBc) | Verdict |
|---|---|---|---|---|---|---|
| NVNT | BLE | 2402 | Ant | -51.93 | -20 | Pass |
| NVNT | BLE | 2480 | Ant | -52.9 | -20 | Pass |

Test Graphs

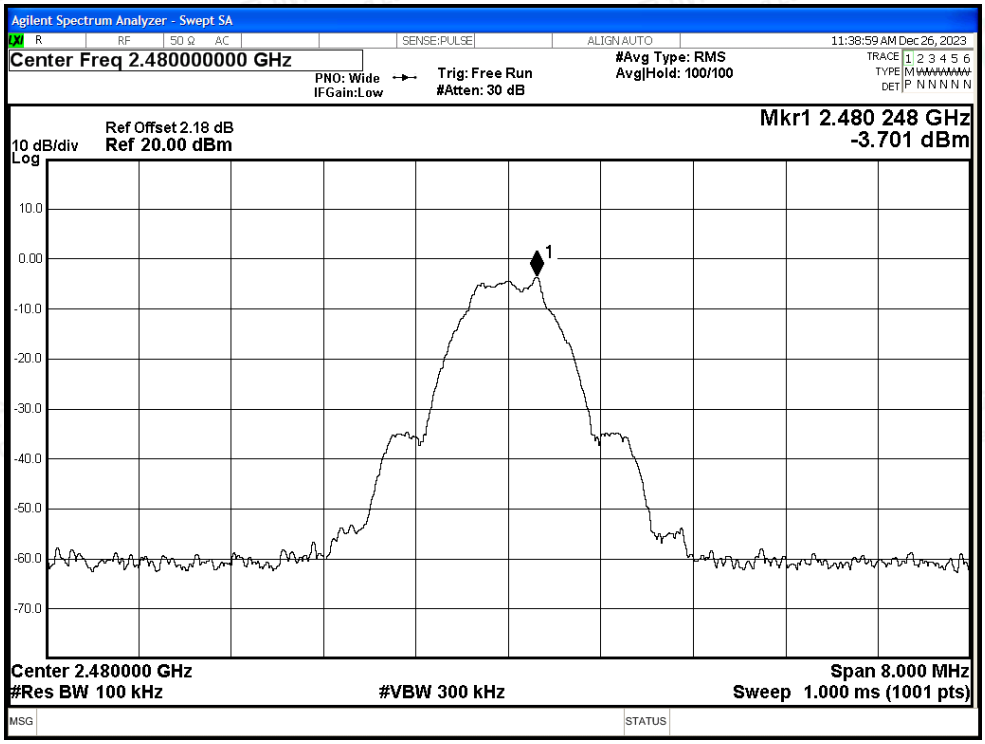
Band Edge NVNT BLE 2402MHz Ant Ref



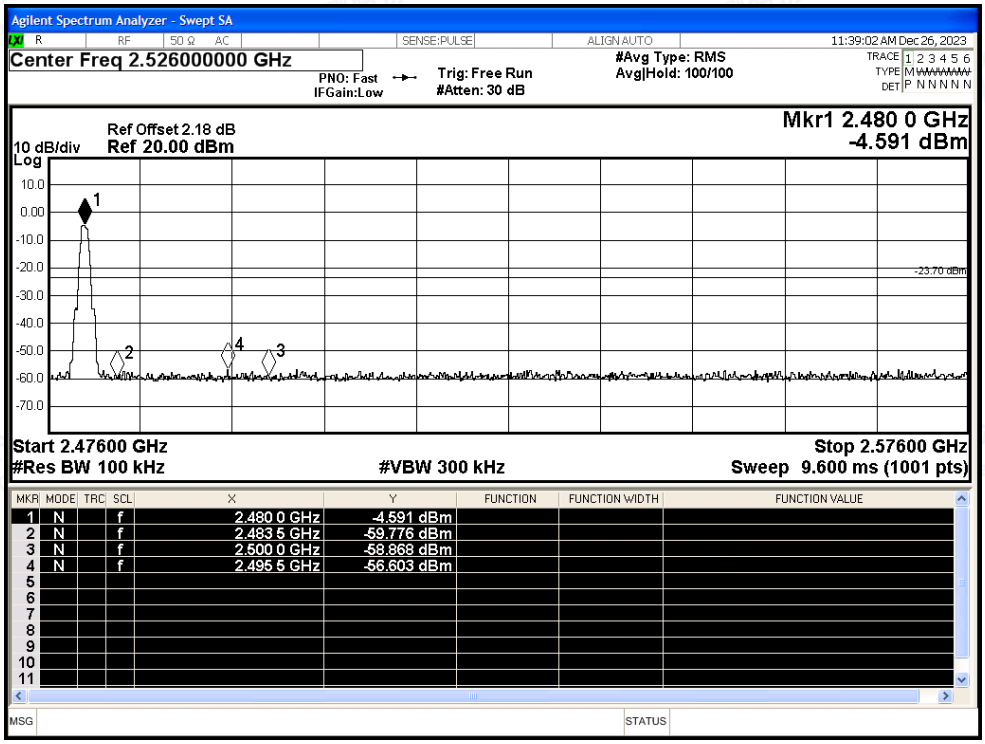

Band Edge NVNT BLE 2402MHz Ant Emission



Band Edge NVNT BLE 2480MHz Ant Ref




Band Edge NVNT BLE 2480MHz Ant Emission

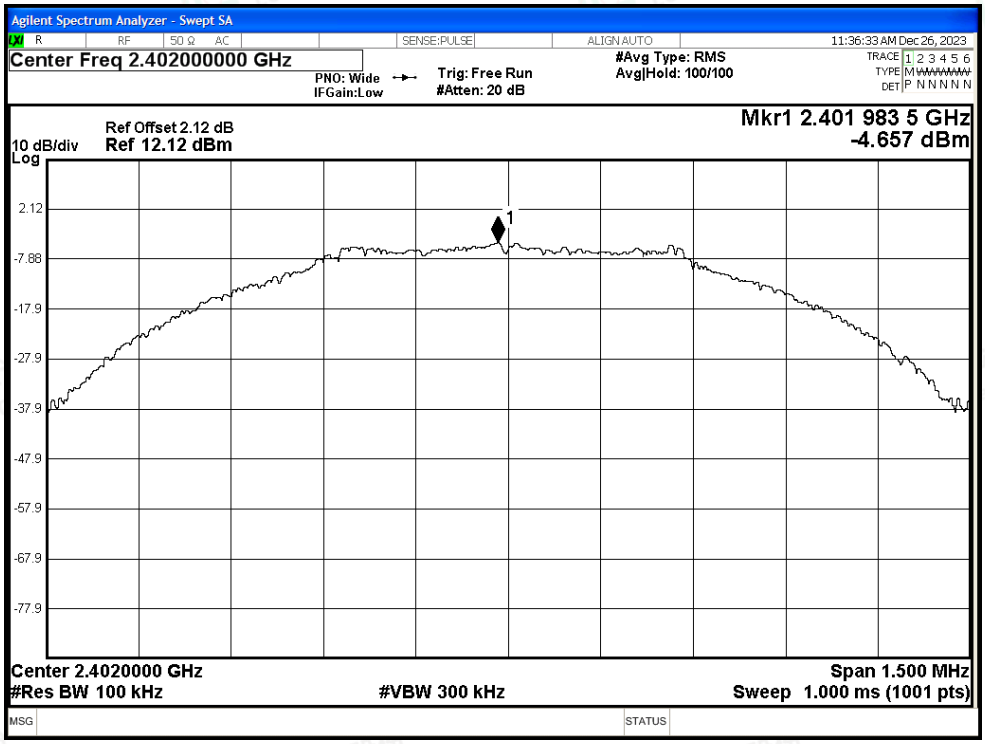


# A.6 Conducted RF Spurious Emission

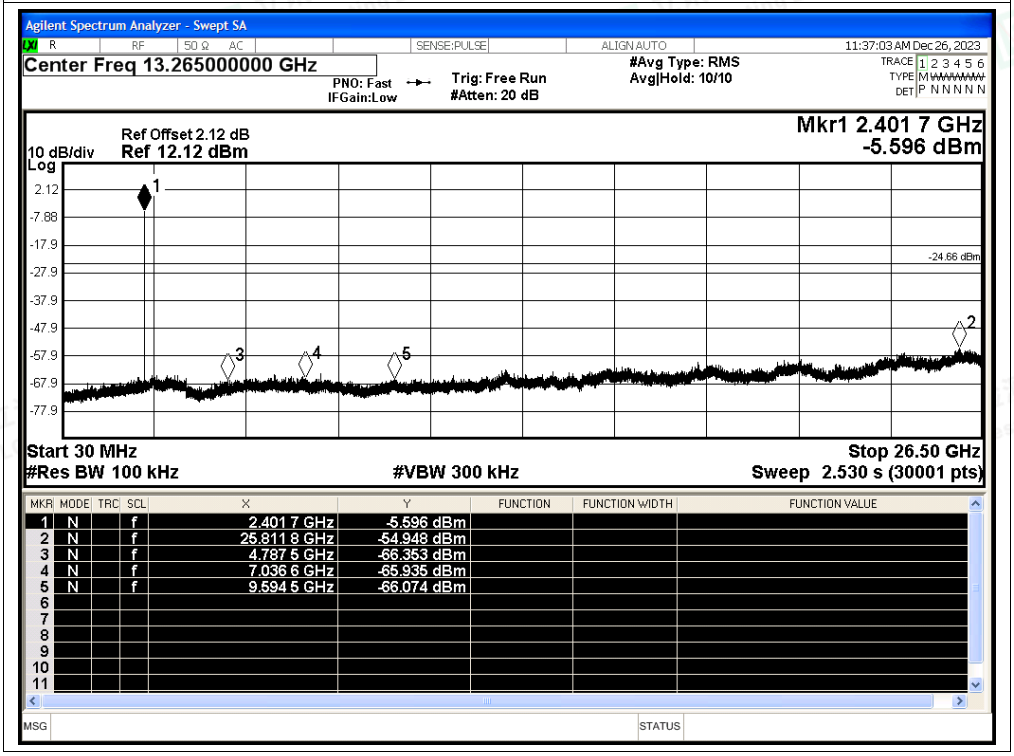
| Condition | Mode | Frequency (MHz) | Antenna | Max Value (dBc) | Limit (dBc) | Verdict |
|---|---|---|---|---|---|---|
| NVNT | BLE | 2402 | Ant | -50.29 | -20 | Pass |
| NVNT | BLE | 2440 | Ant | -52.19 | -20 | Pass |
| NVNT | BLE | 2480 | Ant | -51.41 | -20 | Pass |

Test Graphs

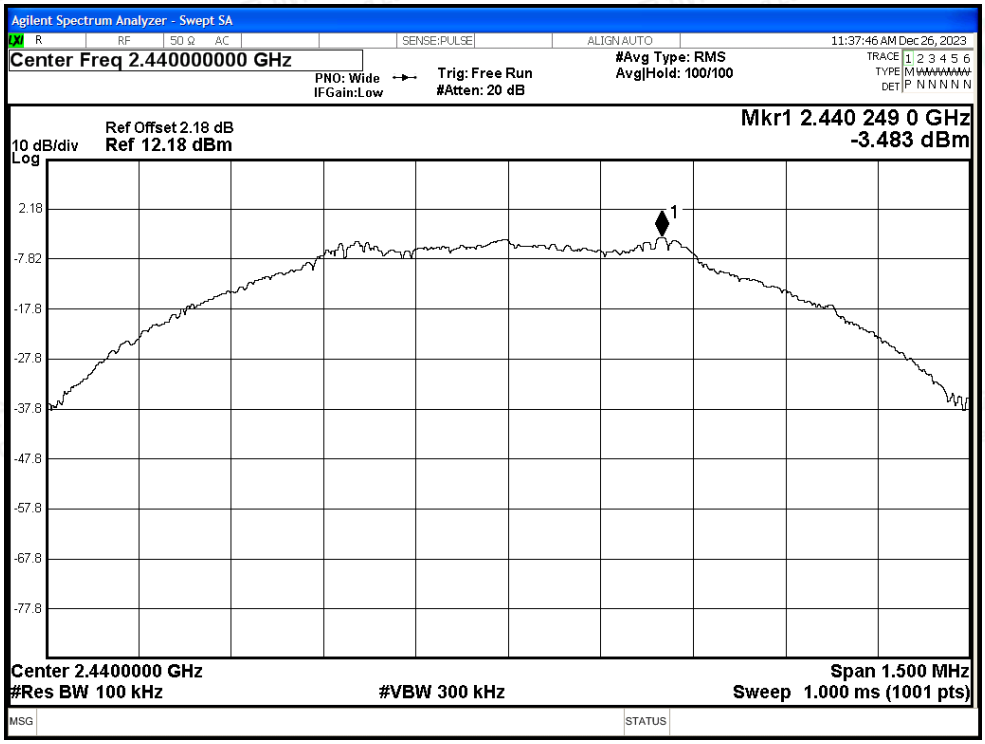
Tx. Spurious NVNT BLE 2402MHz Ant Ref



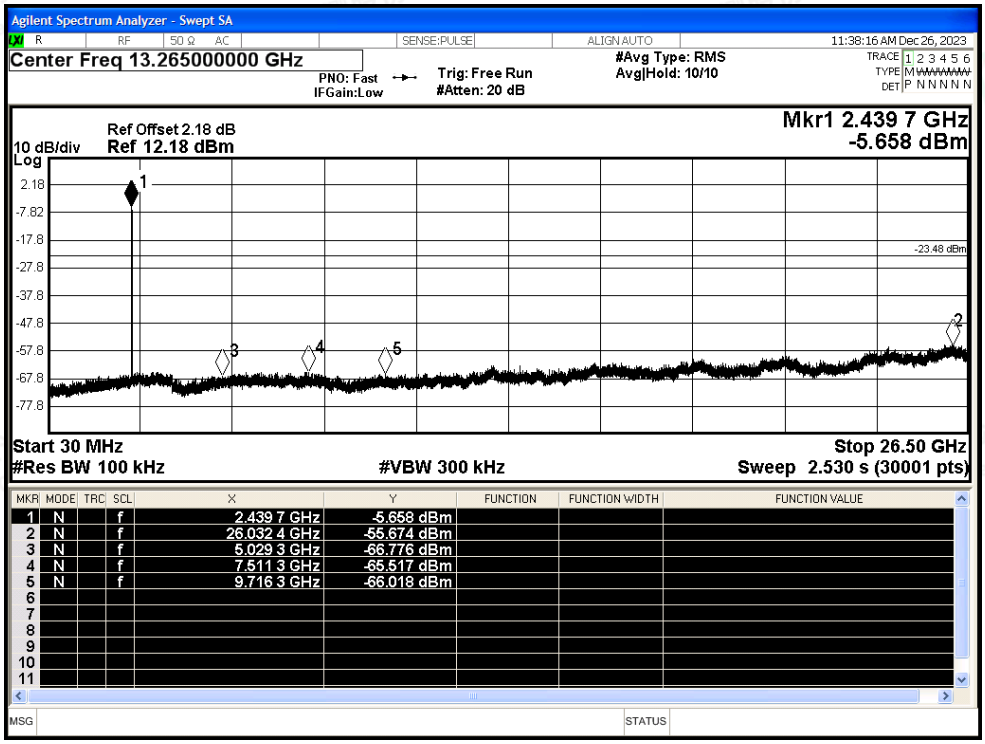

Tx. Spurious NVNT BLE 2402MHz Ant Emission



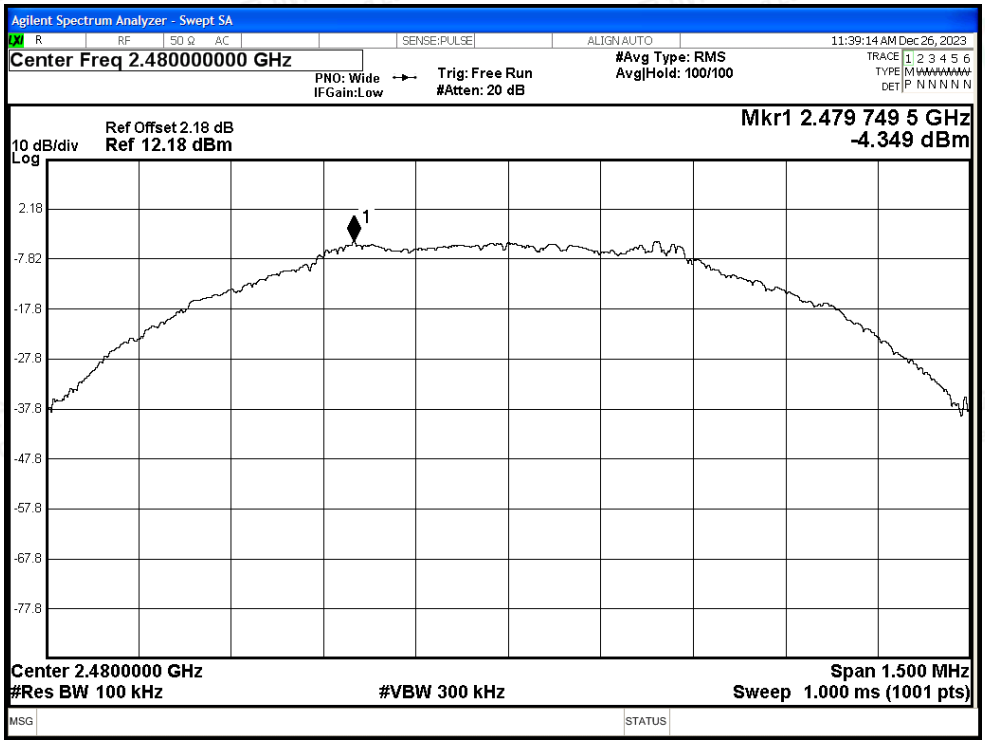
Tx. Spurious NVNT BLE 2440MHz Ant Ref



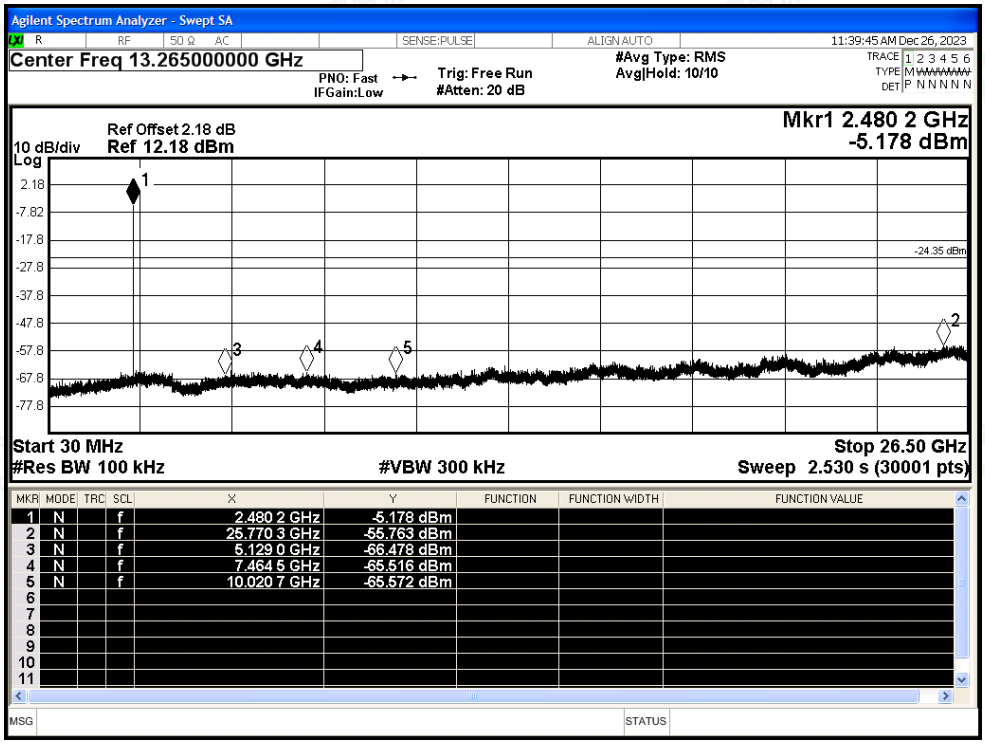

Tx. Spurious NVNT BLE 2440MHz Ant Emission



Tx. Spurious NVNT BLE 2480MHz Ant Ref




Tx. Spurious NVNT BLE 2480MHz Ant Emission

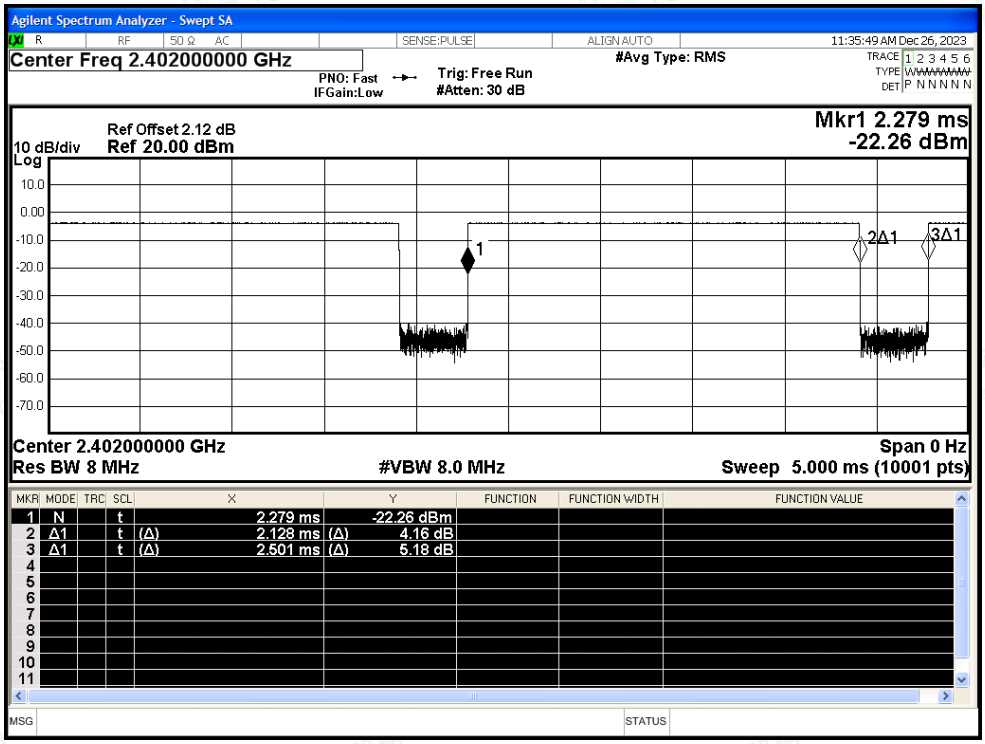


# A.7 Duty Cycle

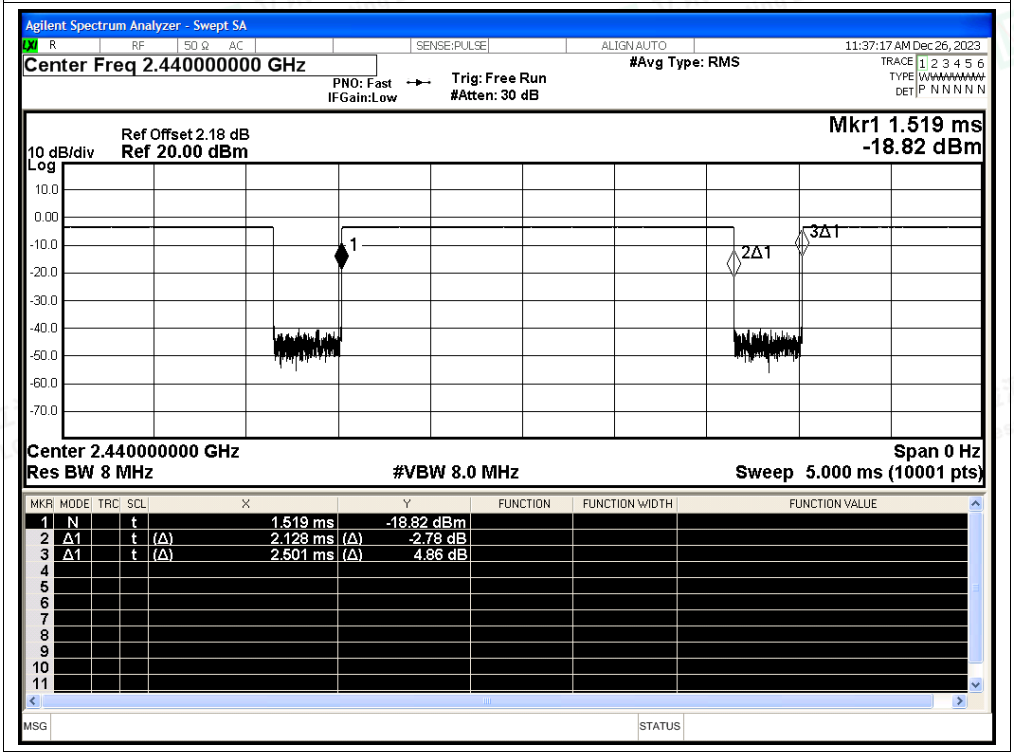
| Condition | Mode | Frequency (MHz) | Antenna | Duty Cycle (%) | Correction Factor (dB) | 1/T (kHz) |
|---|---|---|---|---|---|---|
| NVNT | BLE | 2402 | Ant | 85.1 | 0.7 | 0.47 |
| NVNT | BLE | 2440 | Ant | 85.1 | 0.7 | 0.47 |
| NVNT | BLE | 2480 | Ant | 85.1 | 0.7 | 0.47 |

Test Graphs

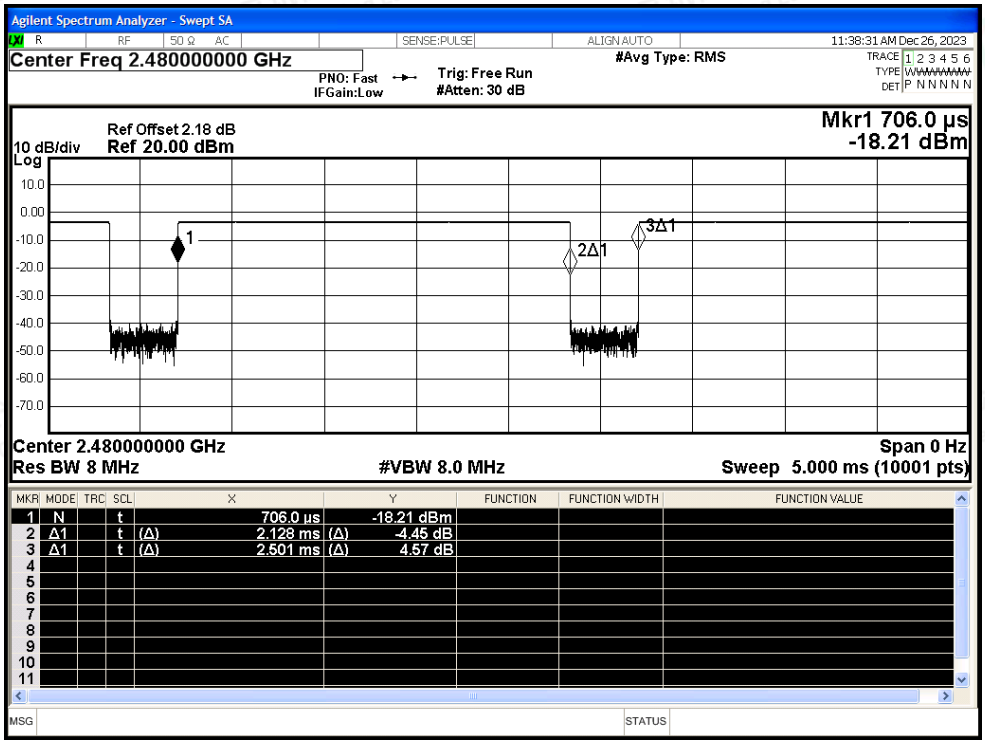
Duty Cycle NVNT BLE 2402MHz Ant




Duty Cycle NVNT BLE 2440MHz Ant



Duty Cycle NVNT BLE 2480MHz Ant

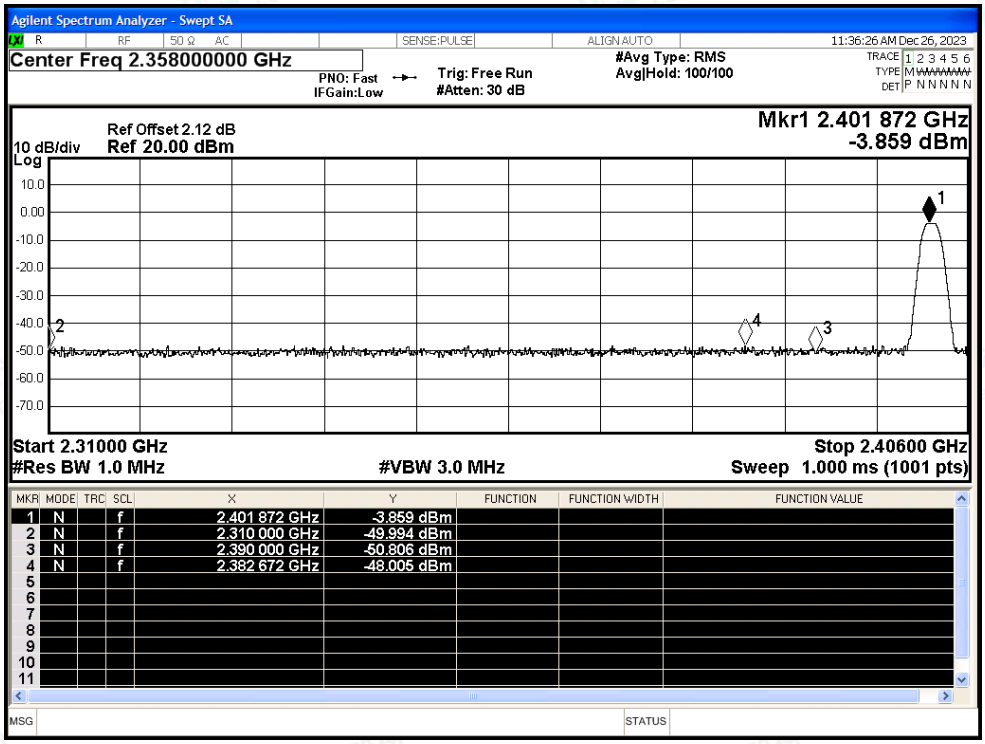


# A.8 Restrict Band

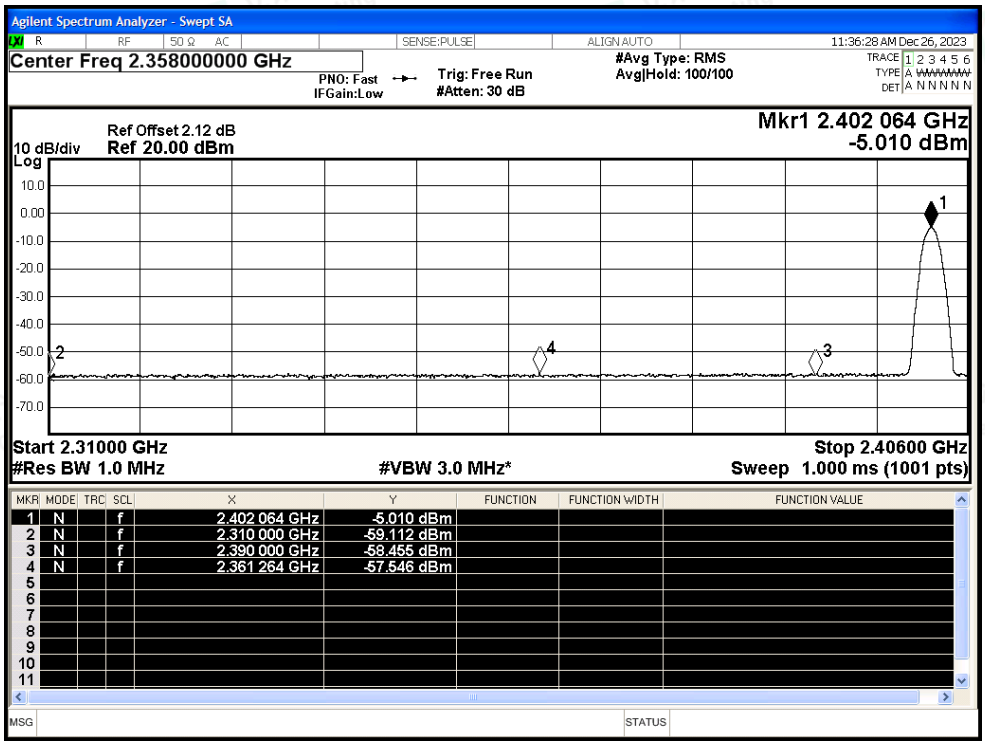
| Condition | Mode | Frequency (MHz) | Antenna | Spur Freq (MHz) | Power (dBm) | Gain (dBi) | Duty Factor (dB) | E (dBuV/m) | Detector | Limit (dBuV/m) | Verdict |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NVNT | BLE | 2402 | Ant | 2310 | -49.99 | 5.3 | - | 50.54 | Peak | 74 | Pass |
| NVNT | BLE | 2402 | Ant | 2310 | -59.11 | 5.3 | 0.7 | 42.12 | Average | 54 | Pass |
| NVNT | BLE | 2402 | Ant | 2382.672 | -48.01 | 5.3 | - | 52.52 | Peak | 74 | Pass |
| NVNT | BLE | 2402 | Ant | 2361.264 | -57.55 | 5.3 | 0.7 | 43.68 | Average | 54 | Pass |
| NVNT | BLE | 2402 | Ant | 2390 | -50.81 | 5.3 | - | 49.72 | Peak | 74 | Pass |
| NVNT | BLE | 2402 | Ant | 2390 | -58.46 | 5.3 | 0.7 | 42.77 | Average | 54 | Pass |
| NVNT | BLE | 2480 | Ant | 2483.5 | -49.93 | 5.3 | - | 50.60 | Peak | 74 | Pass |
| NVNT | BLE | 2480 | Ant | 2483.5 | -57.58 | 5.3 | 0.7 | 43.65 | Average | 54 | Pass |
| NVNT | BLE | 2480 | Ant | 2497.552 | -47.66 | 5.3 | - | 52.87 | Peak | 74 | Pass |
| NVNT | BLE | 2480 | Ant | 2487.568 | -57.31 | 5.3 | 0.7 | 43.92 | Average | 54 | Pass |
| NVNT | BLE | 2480 | Ant | 2500 | -50.32 | 5.3 | - | 50.21 | Peak | 74 | Pass |
| NVNT | BLE | 2480 | Ant | 2500 | -57.58 | 5.3 | 0.7 | 43.65 | Average | 54 | Pass |

Test Graphs

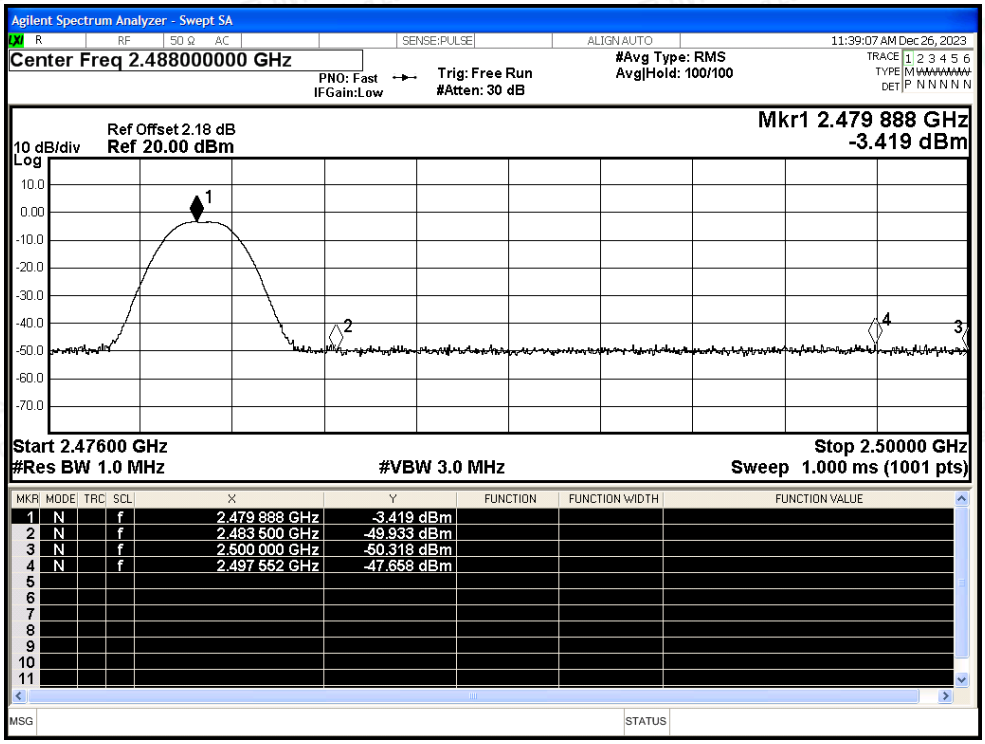
Restrict Band NVNT BLE 2402MHz Ant Peak

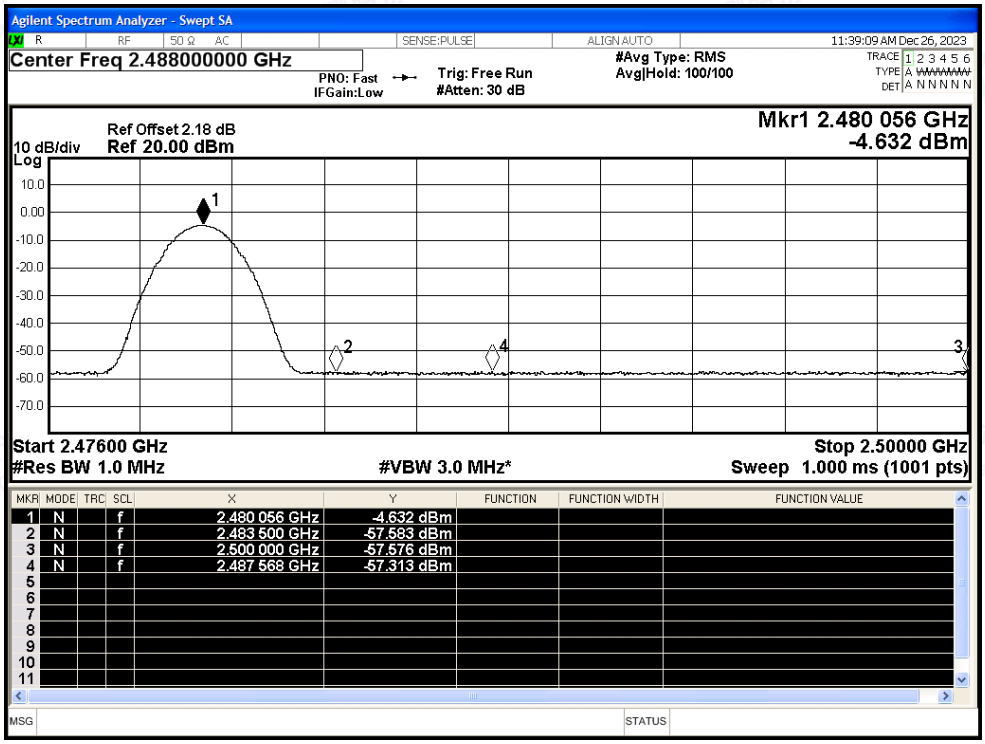



Restrict Band NVNT BLE 2402MHz Ant Average



Restrict Band NVNT BLE 2480MHz Ant Peak




Restrict Band NVNT BLE 2480MHz Ant Average