



## Appendix A

### RF Test Data for BLE (Conducted Measurement)

Product Name: bluetooth beacon

Test Model: ZONITH A5

#### Environmental Conditions

|                    |           |
|--------------------|-----------|
| Temperature:       | 24.3° C   |
| Relative Humidity: | 53.6%     |
| ATM Pressure:      | 100.0 kPa |
| Test Engineer:     | Can Kun   |
| Supervised by:     | Nick Peng |





## A.1 -6dB Bandwidth

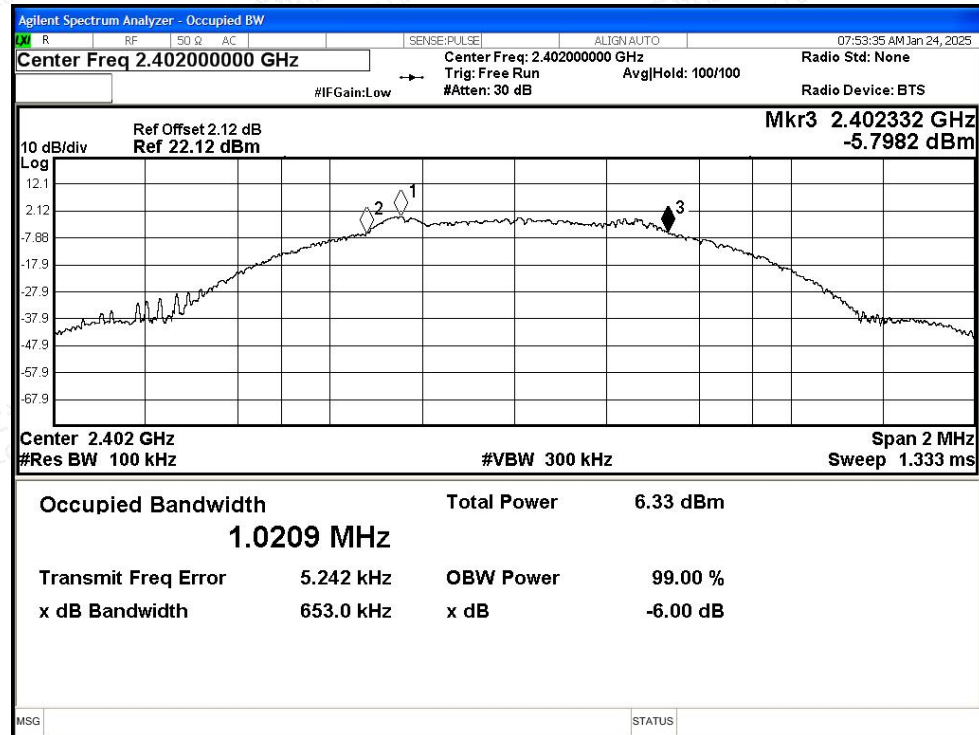
| Condition | Mode   | Frequency (MHz) | Antenna | -6 dB Bandwidth (MHz) | Limit -6 dB Bandwidth (MHz) | Verdict |
|-----------|--------|-----------------|---------|-----------------------|-----------------------------|---------|
| NVNT      | BLE 1M | 2402            | Ant1    | 0.653                 | $\geq 0.5$                  | Pass    |
| NVNT      | BLE 1M | 2440            | Ant1    | 0.658                 | $\geq 0.5$                  | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 0.66                  | $\geq 0.5$                  | Pass    |



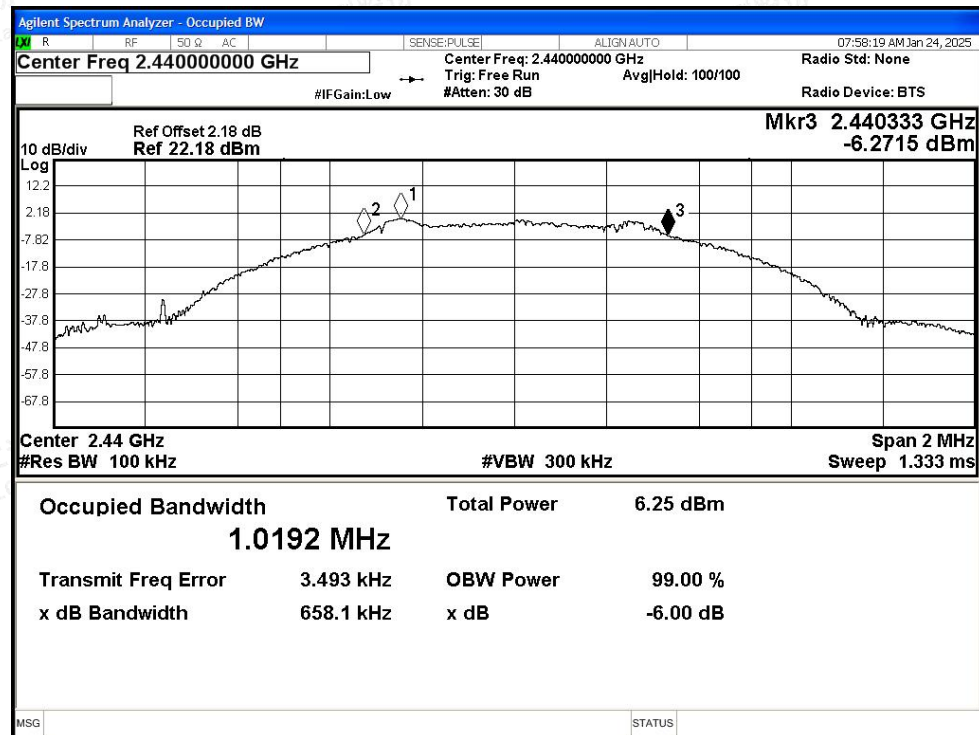


## Test Graphs

-6dB Bandwidth NVNT BLE 1M 2402MHz Ant1



-6dB Bandwidth NVNT BLE 1M 2440MHz Ant1

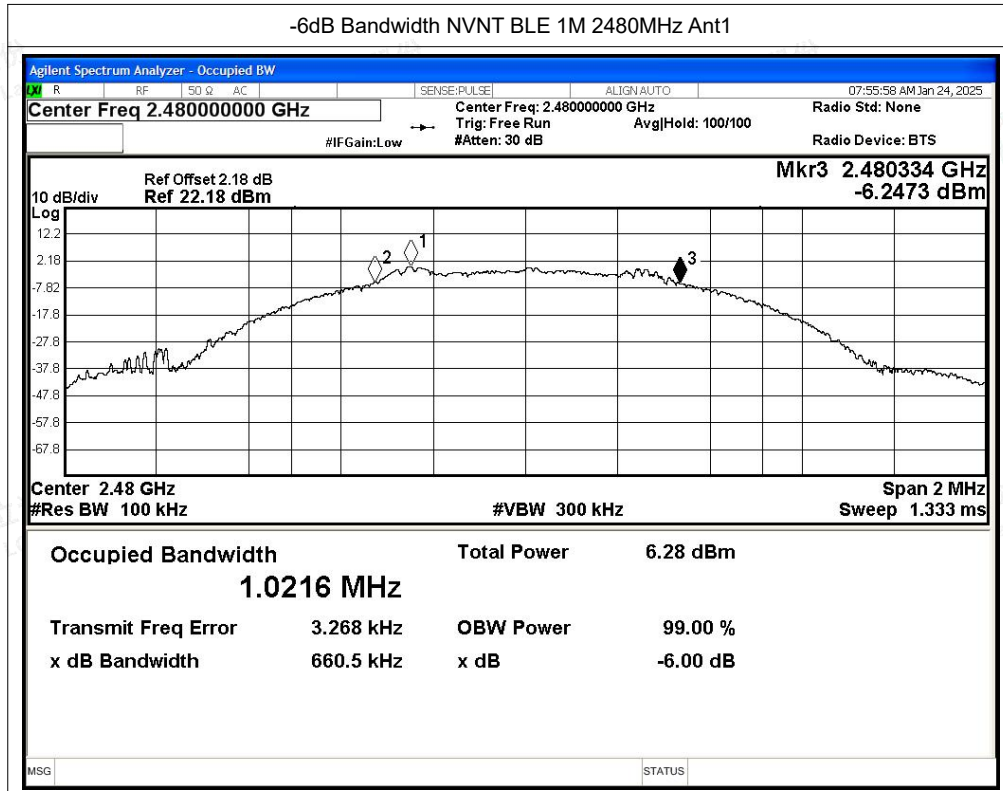


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## A.2 Maximum Peak Conducted Output Power

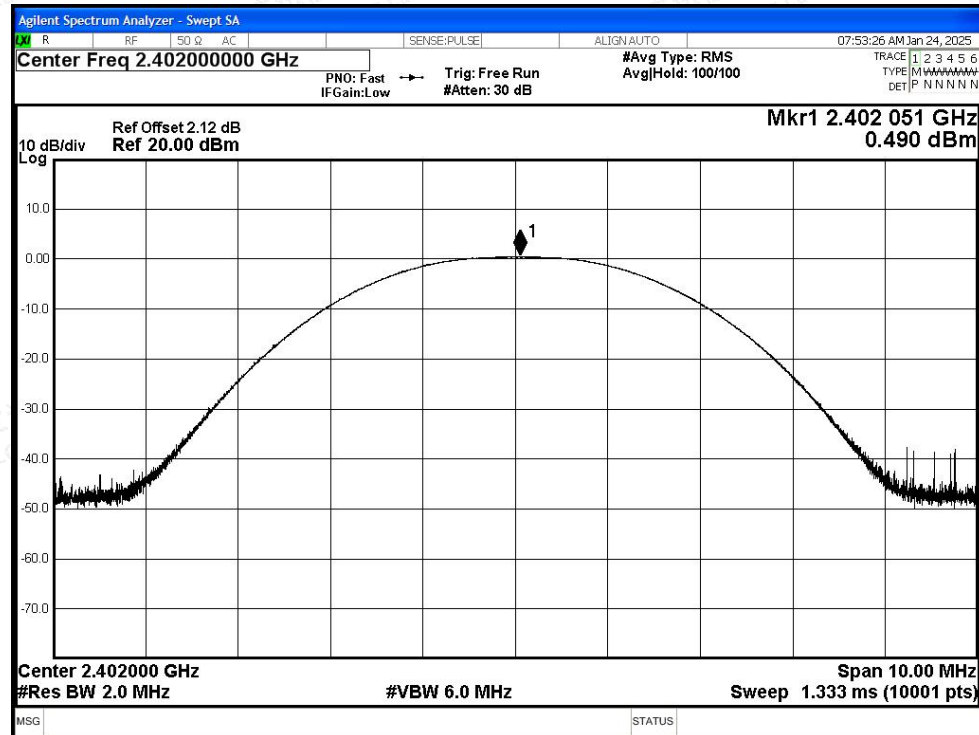
| Condition | Mode   | Frequency (MHz) | Antenna | Conducted Power (dBm) | Limit (dBm) | Verdict |
|-----------|--------|-----------------|---------|-----------------------|-------------|---------|
| NVNT      | BLE 1M | 2402            | Ant1    | 0.49                  | 30          | Pass    |
| NVNT      | BLE 1M | 2440            | Ant1    | 0.35                  | 30          | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 0.45                  | 30          | Pass    |



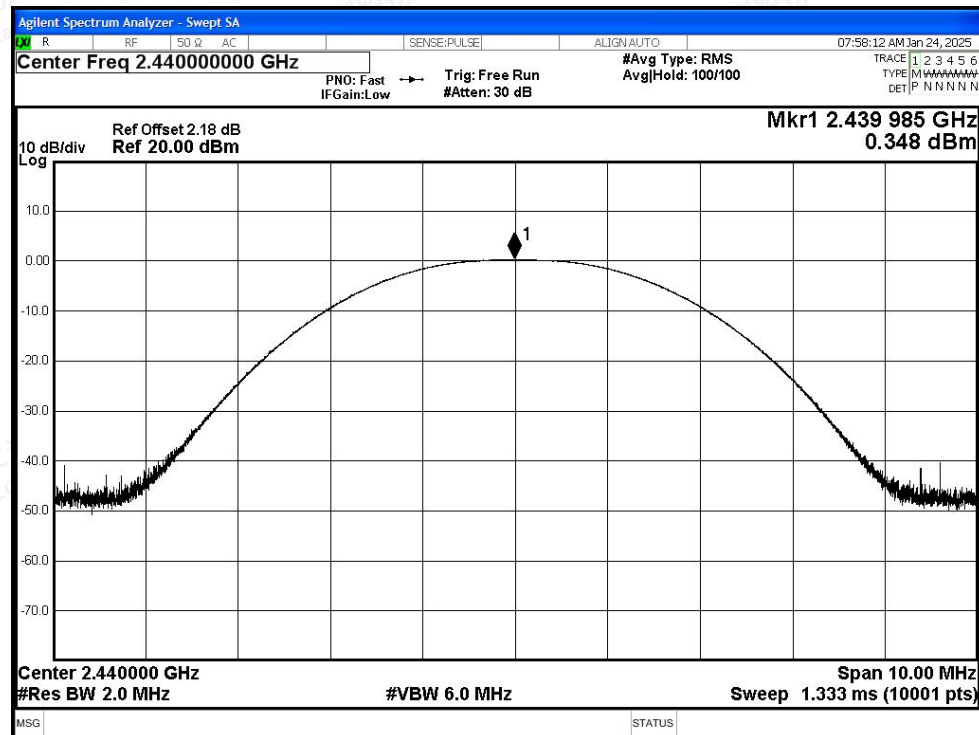


## Test Graphs

## Power NVNT BLE 1M 2402MHz Ant1



## Power NVNT BLE 1M 2440MHz Ant1

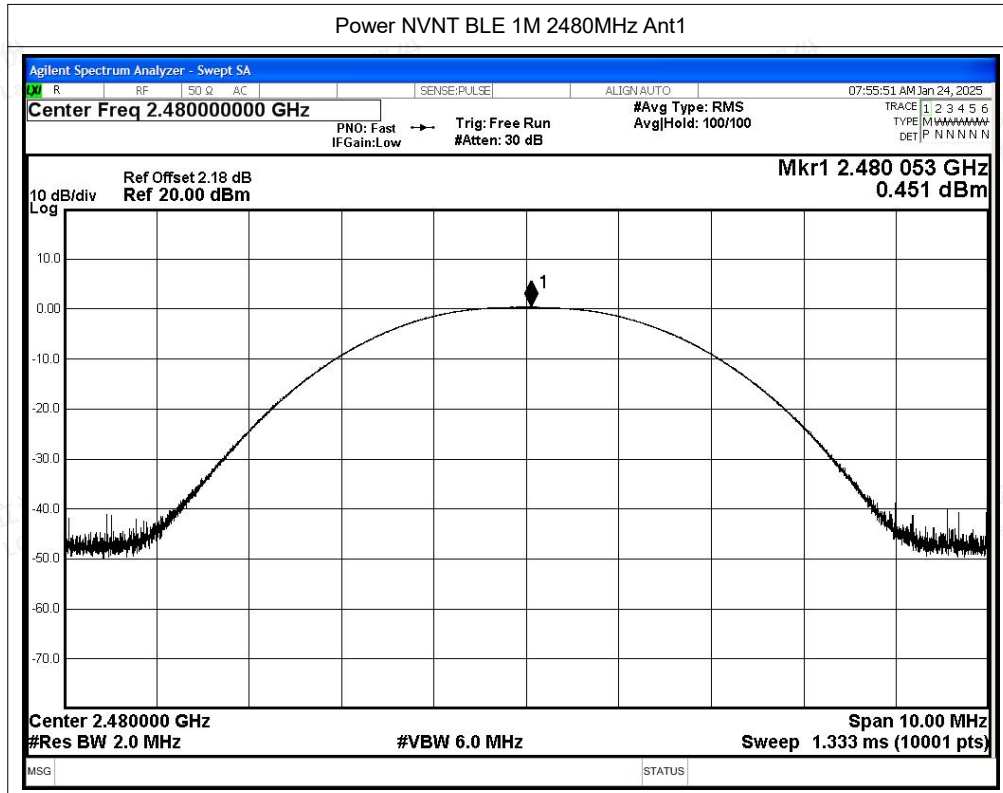


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### A.3 Maximum Power Spectral Density Level

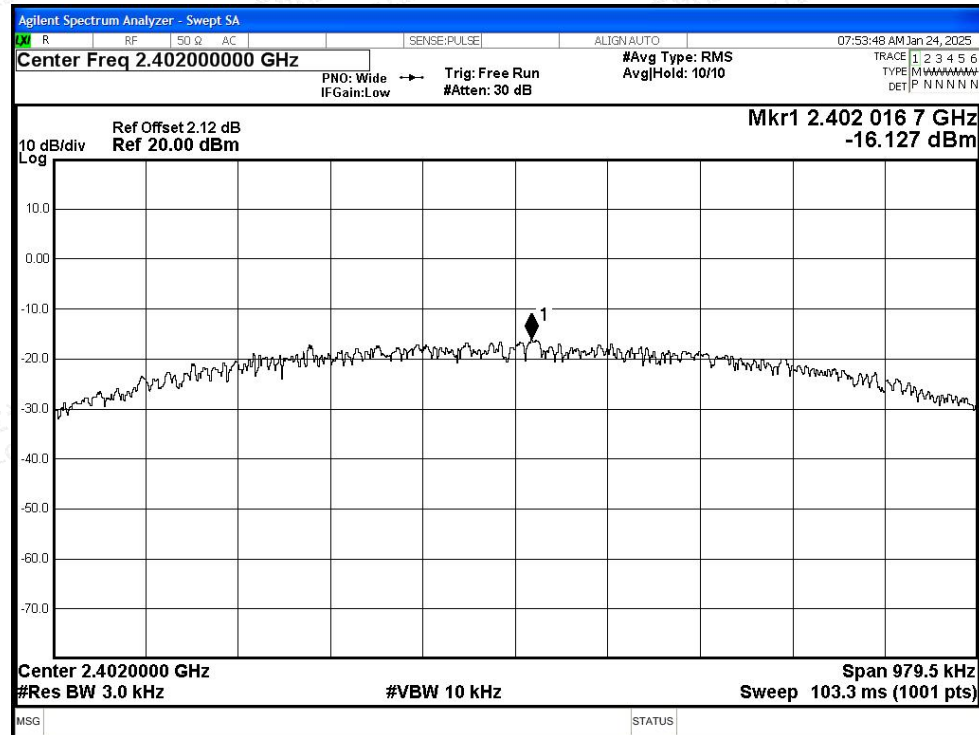
| Condition | Mode   | Frequency (MHz) | Antenna | Conducted PSD (dBm/3kHz) | Limit (dBm/3kHz) | Verdict |
|-----------|--------|-----------------|---------|--------------------------|------------------|---------|
| NVNT      | BLE 1M | 2402            | Ant1    | -16.13                   | 8                | Pass    |
| NVNT      | BLE 1M | 2440            | Ant1    | -16.29                   | 8                | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | -16                      | 8                | Pass    |



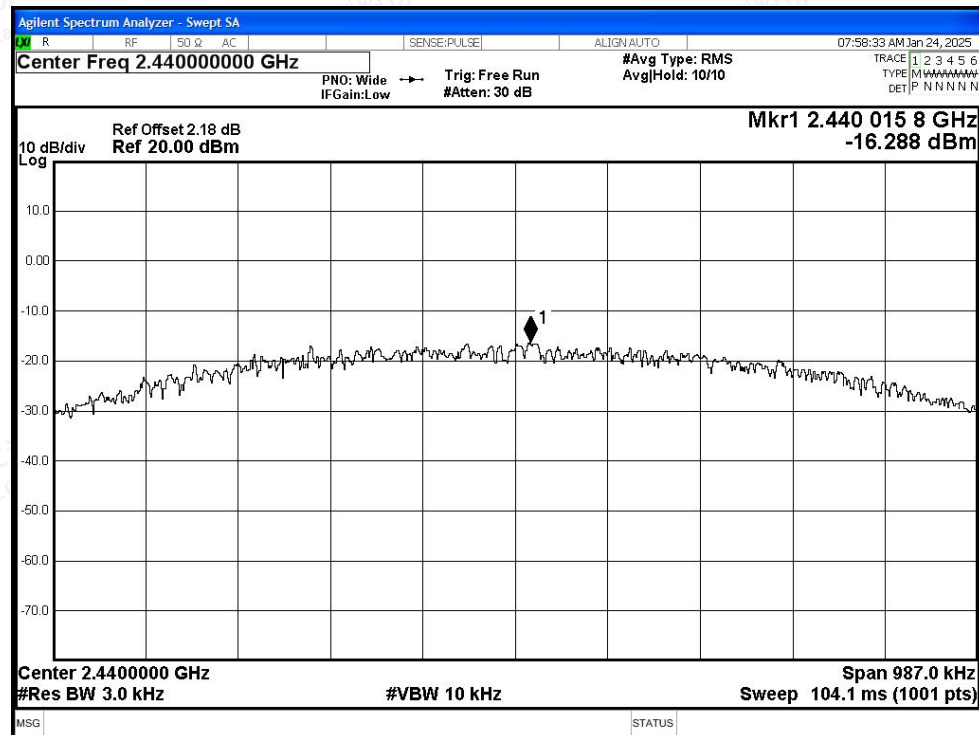


## Test Graphs

## PSD NVNT BLE 1M 2402MHz Ant1



## PSD NVNT BLE 1M 2440MHz Ant1

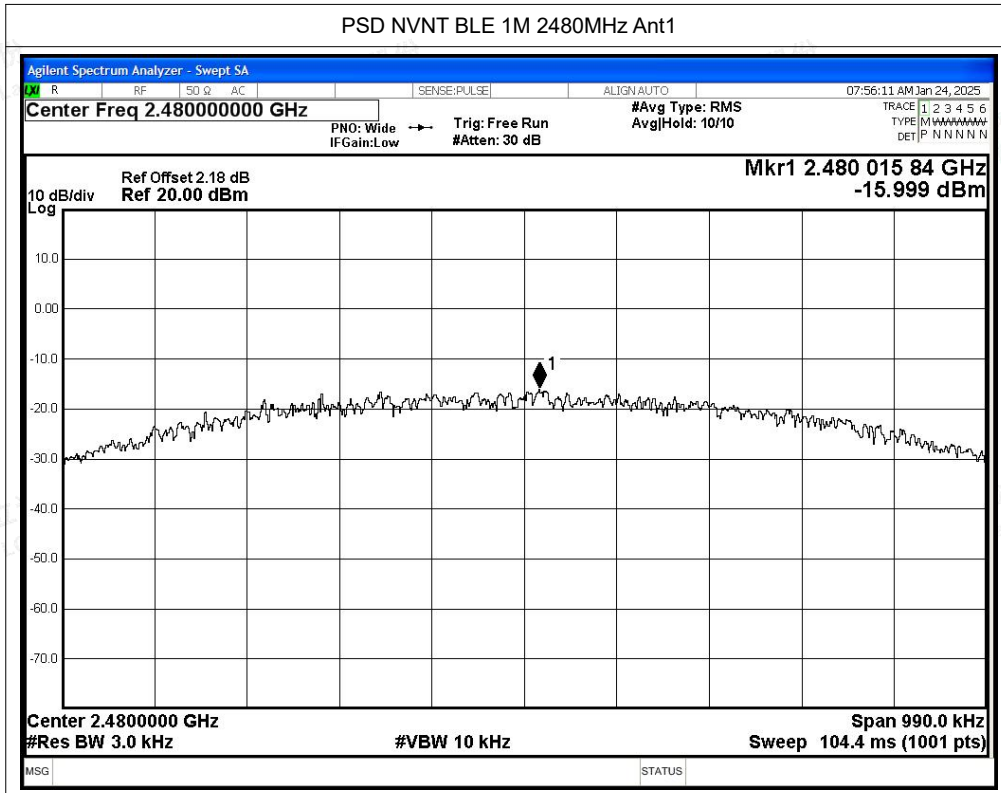


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## A.4 Band Edge

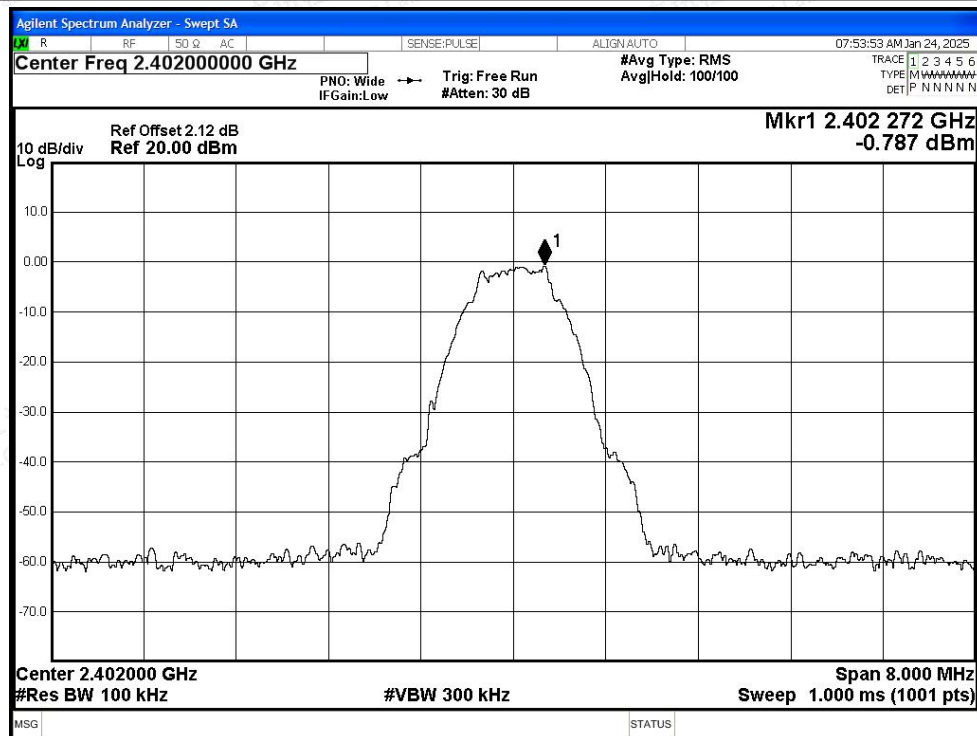
| Condition | Mode   | Frequency (MHz) | Antenna | Max Value (dBc) | Limit (dBc) | Verdict |
|-----------|--------|-----------------|---------|-----------------|-------------|---------|
| NVNT      | BLE 1M | 2402            | Ant1    | -55.11          | -20         | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | -55.11          | -20         | Pass    |



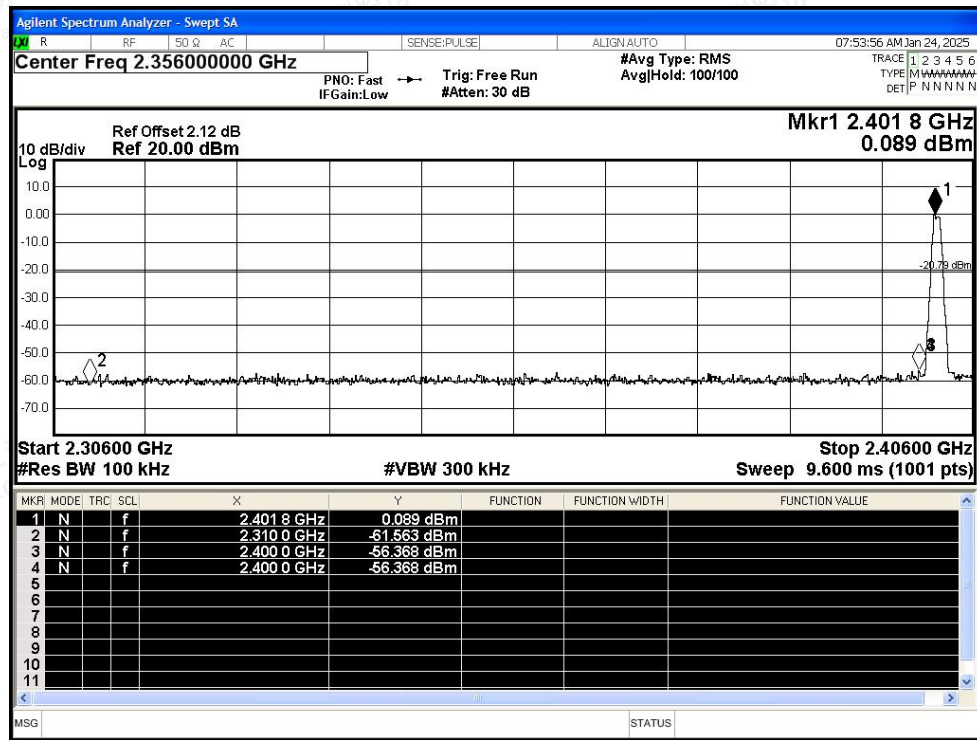


## Test Graphs

## Band Edge NVNT BLE 1M 2402MHz Ant1 Ref



## Band Edge NVNT BLE 1M 2402MHz Ant1 Emission



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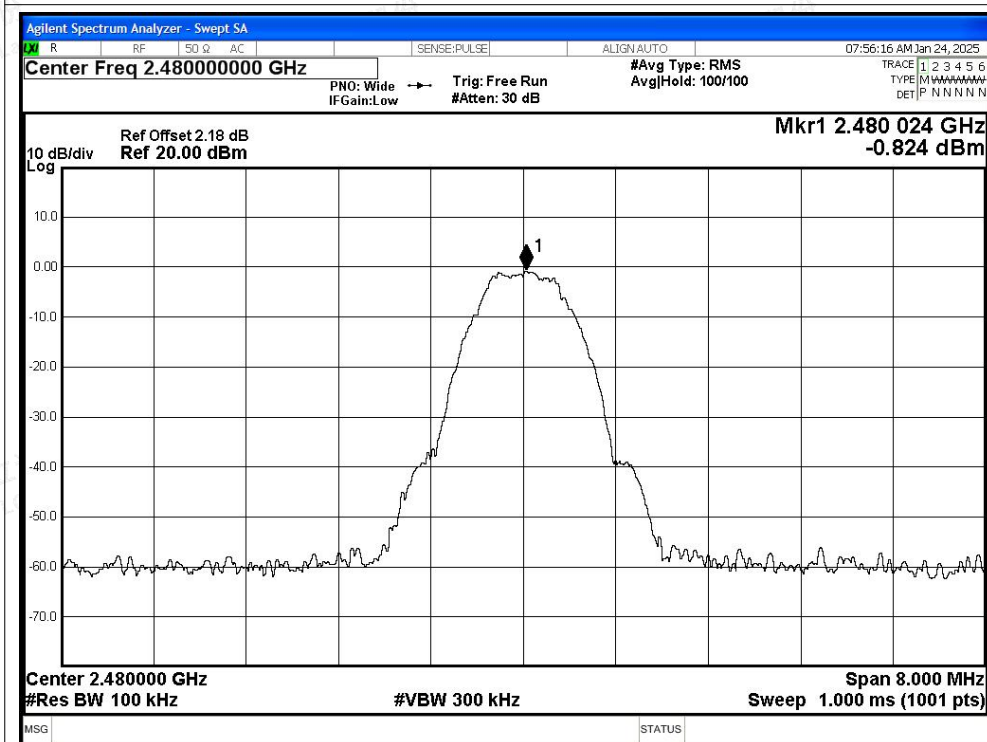
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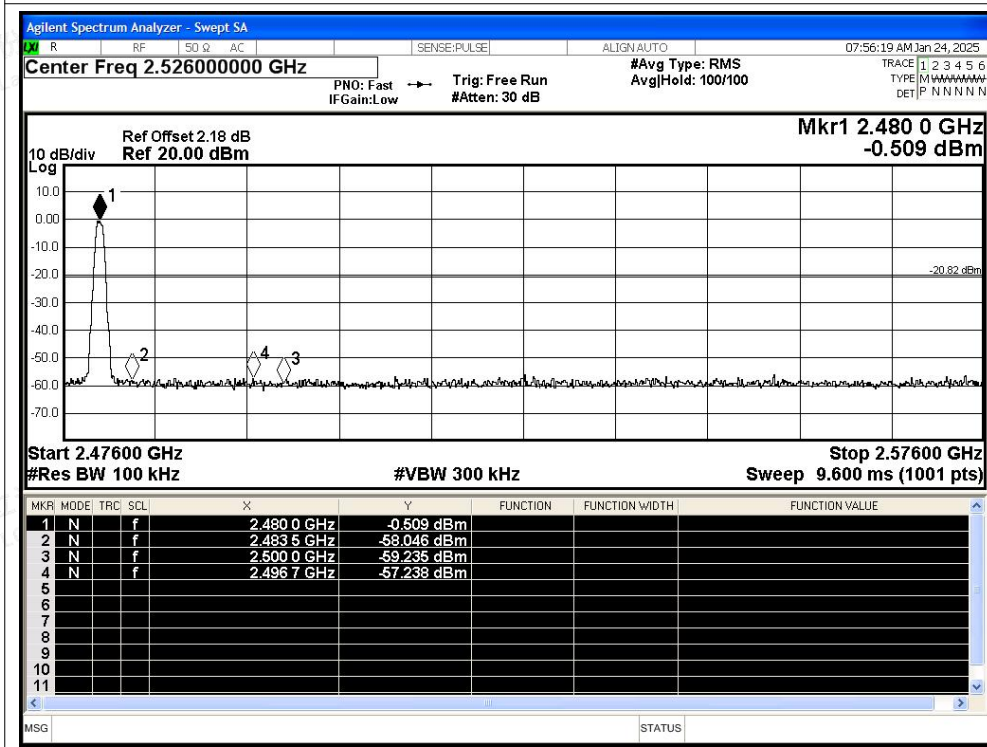
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## Band Edge NVNT BLE 1M 2480MHz Ant1 Ref



## Band Edge NVNT BLE 1M 2480MHz Ant1 Emission



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## A.5 Conducted RF Spurious Emission

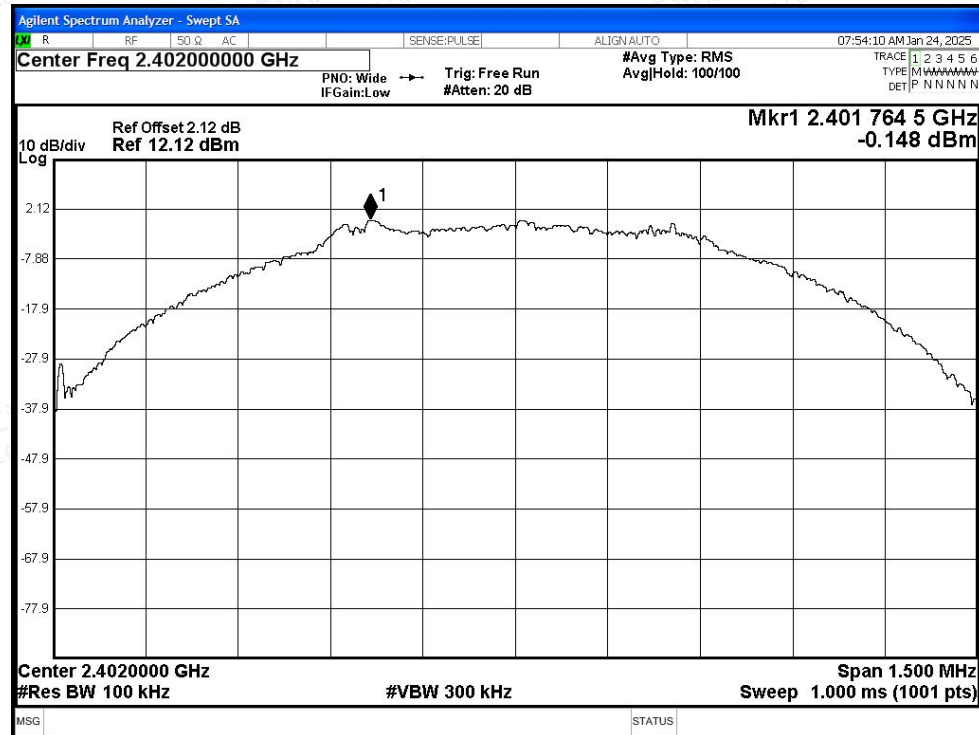
| Condition | Mode   | Frequency (MHz) | Antenna | Max Value (dBc) | Limit (dBc) | Verdict |
|-----------|--------|-----------------|---------|-----------------|-------------|---------|
| NVNT      | BLE 1M | 2402            | Ant1    | -55.77          | -20         | Pass    |
| NVNT      | BLE 1M | 2440            | Ant1    | -55.39          | -20         | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | -55.36          | -20         | Pass    |



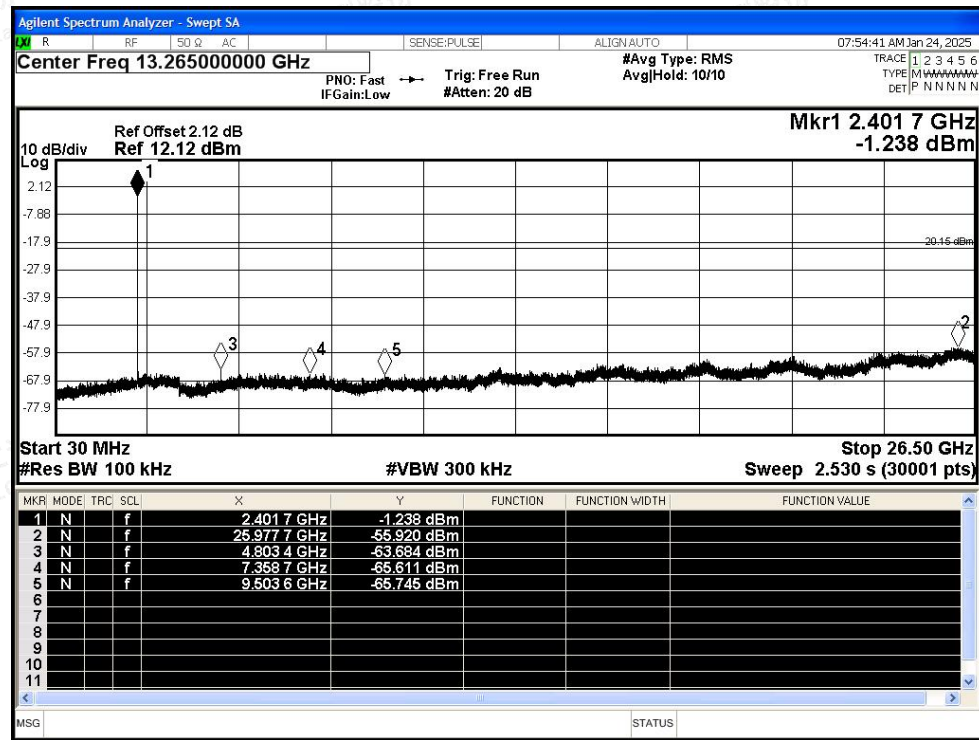


## Test Graphs

## Tx. Spurious NVNT BLE 1M 2402MHz Ant1 Ref



## Tx. Spurious NVNT BLE 1M 2402MHz Ant1 Emission



Shenzhen LCS Compliance Testing Laboratory Ltd.

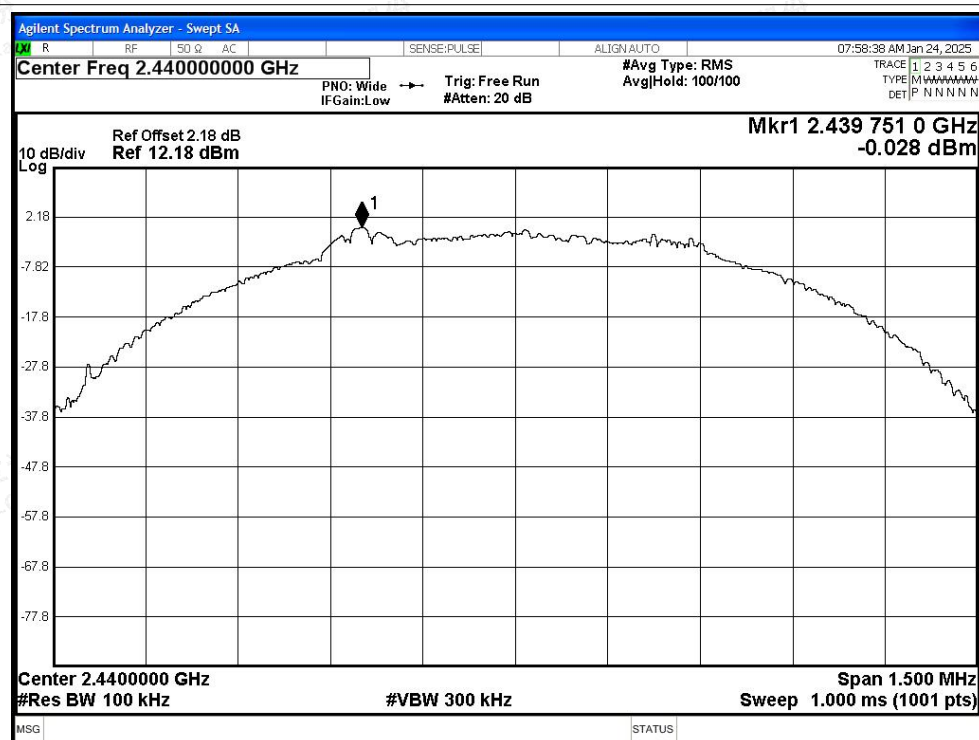
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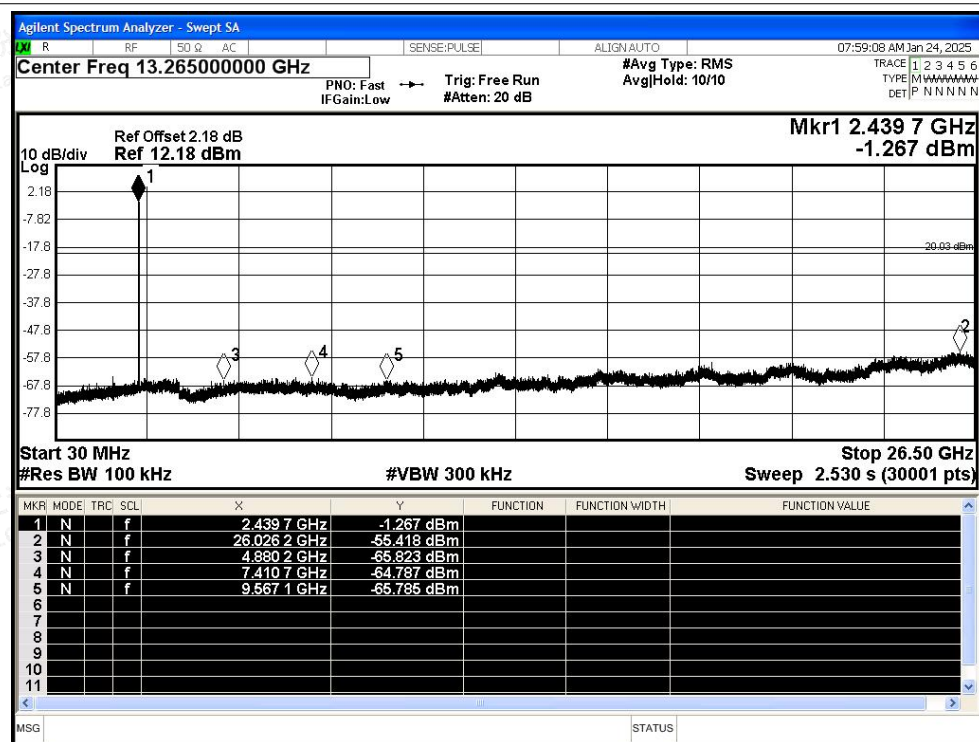
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## Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Ref



## Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Emission



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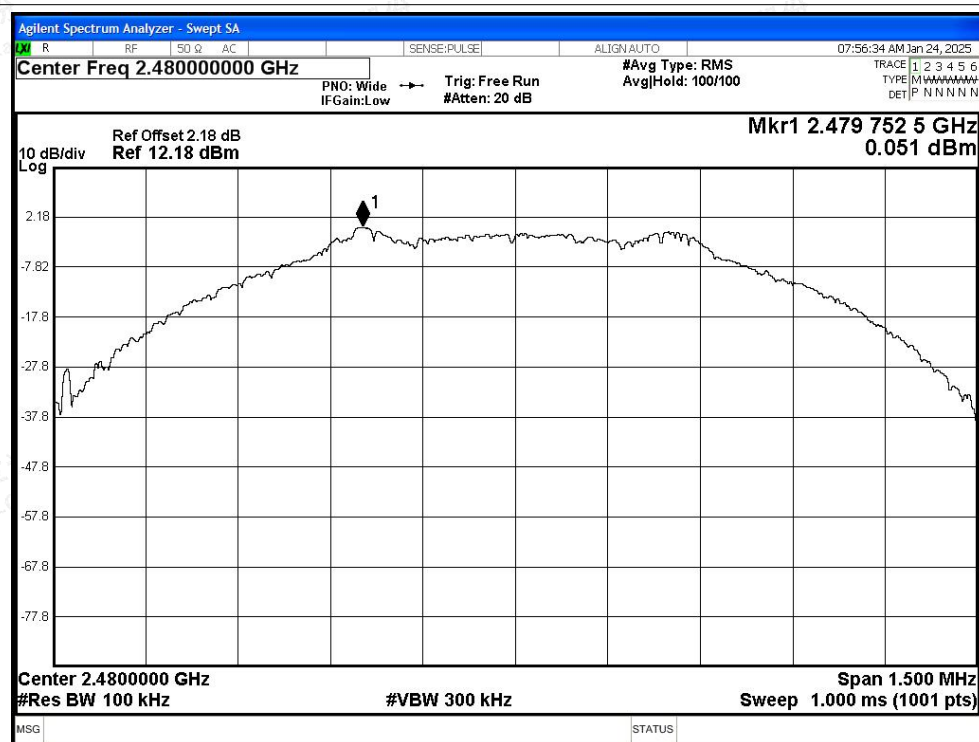
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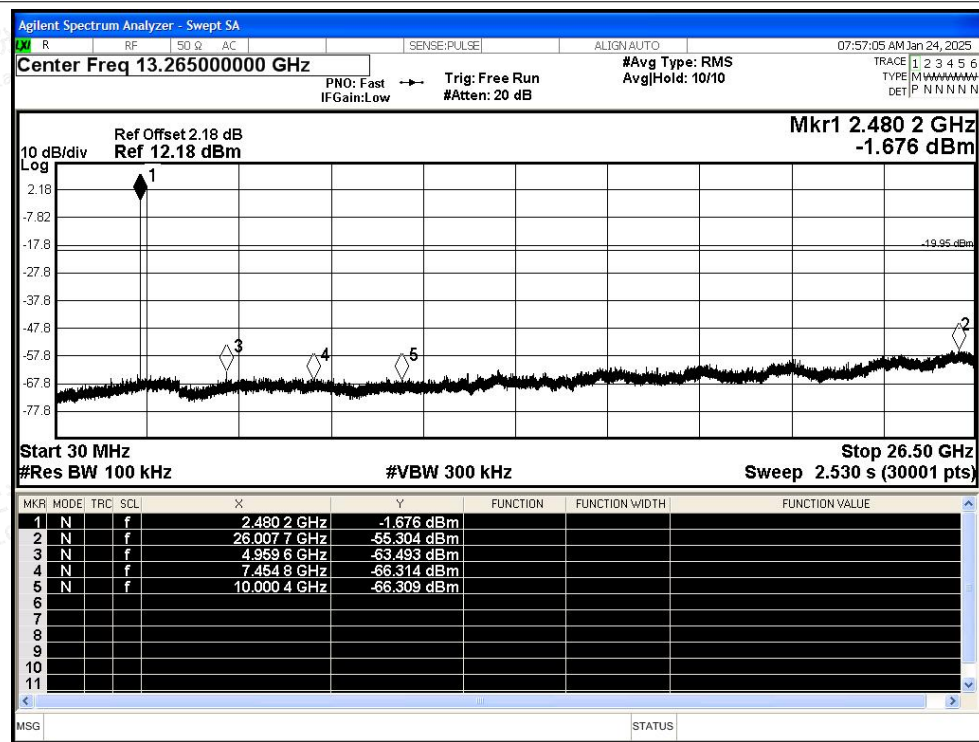
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## Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Ref



## Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Emission



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## A.6 Duty Cycle

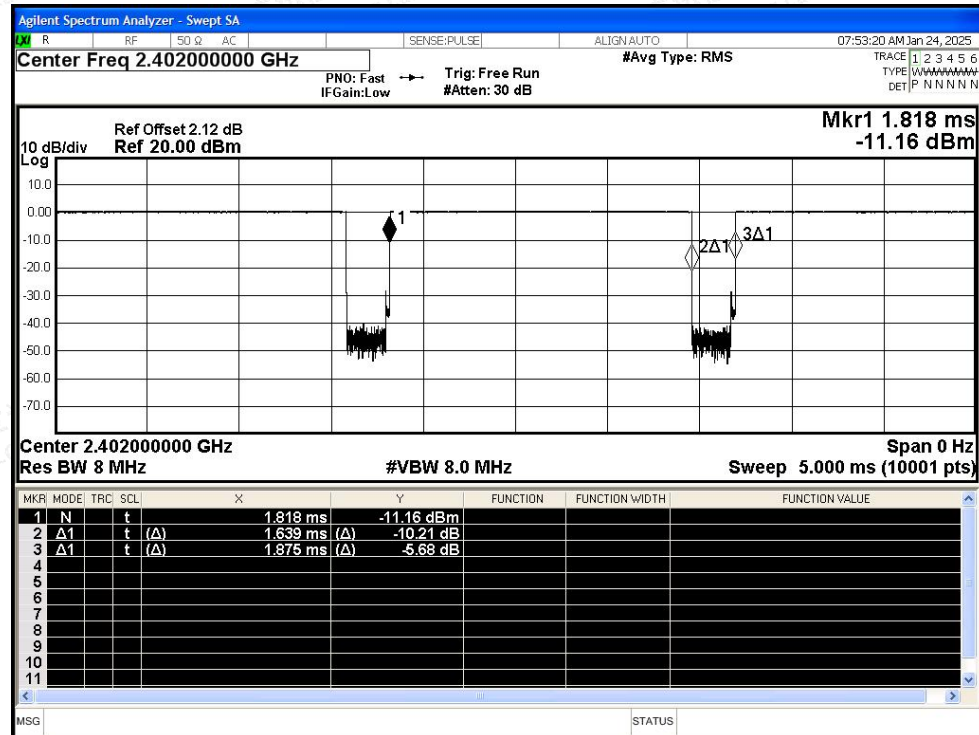
| Condition | Mode   | Frequency (MHz) | Antenna | Duty Cycle (%) | Correction Factor (dB) | 1/T (kHz) |
|-----------|--------|-----------------|---------|----------------|------------------------|-----------|
| NVNT      | BLE 1M | 2402            | Ant1    | 87.39          | 0.59                   | 0.61      |
| NVNT      | BLE 1M | 2440            | Ant1    | 87.39          | 0.59                   | 0.61      |
| NVNT      | BLE 1M | 2480            | Ant1    | 87.39          | 0.59                   | 0.61      |



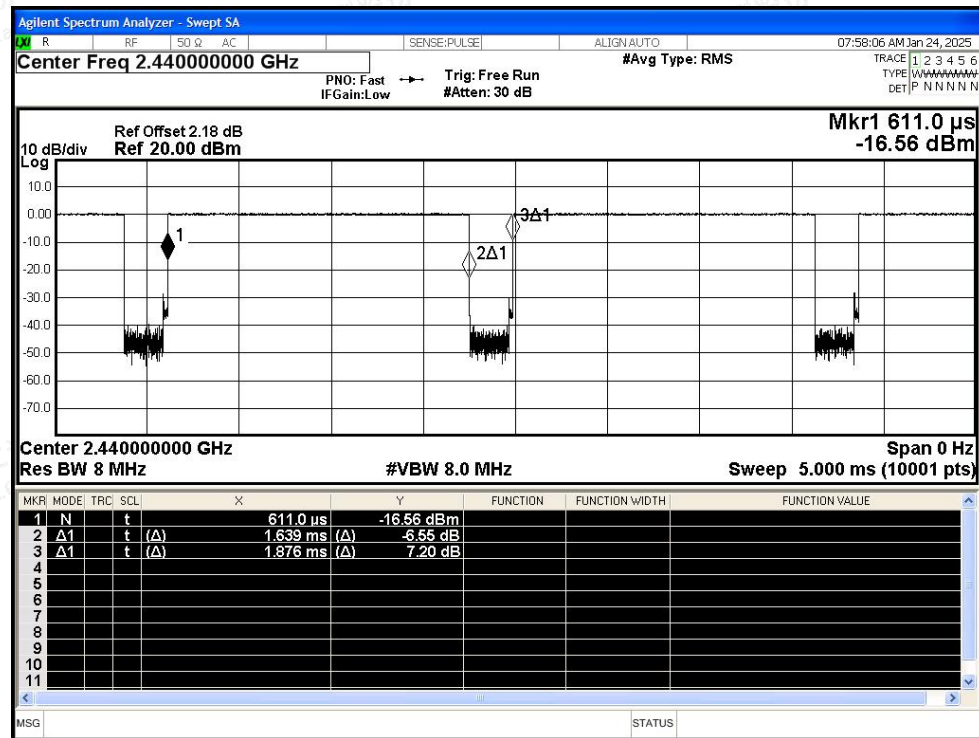


## Test Graphs

## Duty Cycle NVNT BLE 1M 2402MHz Ant1



## Duty Cycle NVNT BLE 1M 2440MHz Ant1

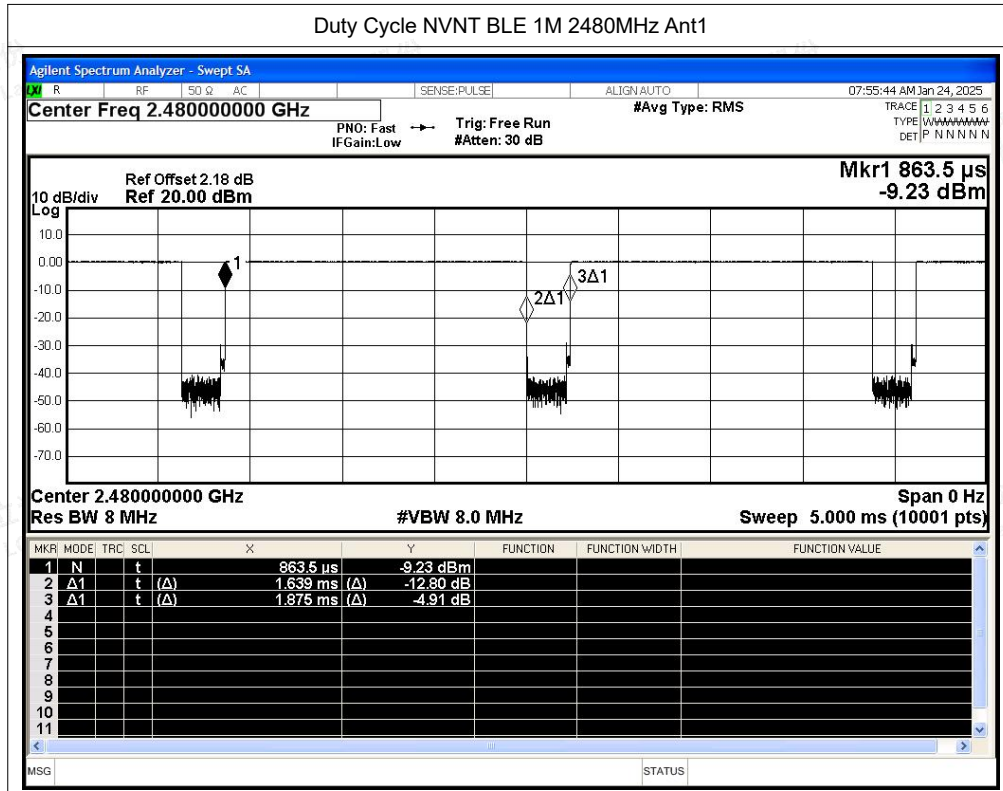


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## A.7 Restrict Band

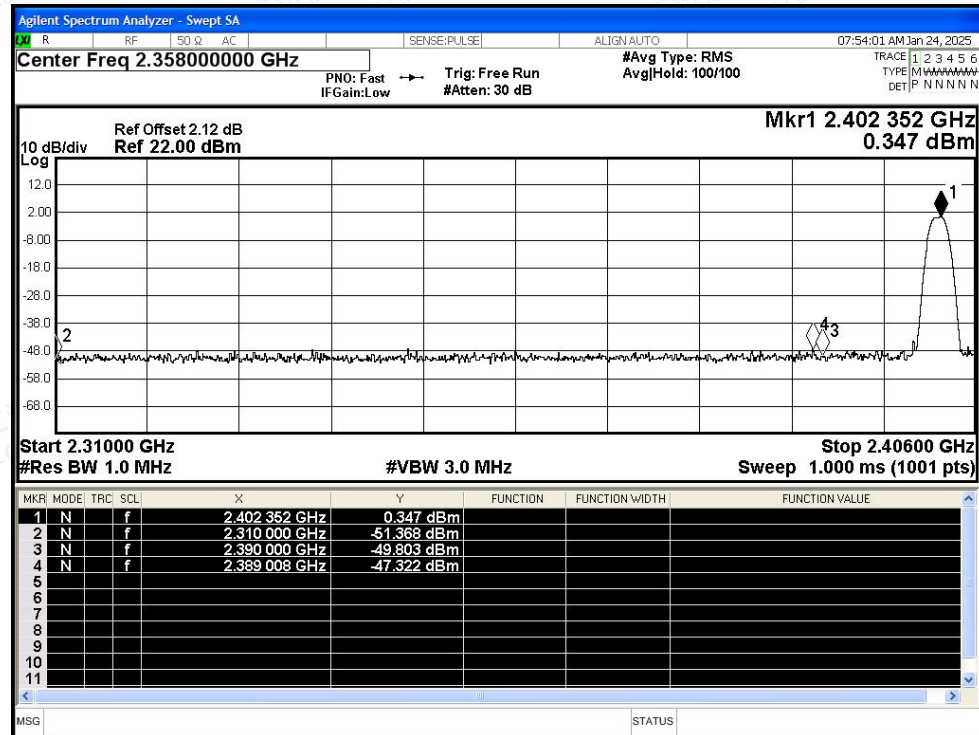
| Condition | Mode   | Frequency (MHz) | Antenna | Spur Freq (MHz) | Power (dBm) | Gain (dBi) | Duty Factor (dB) | E (dBuV/m) | Detector | Limit (dBuV/m) | Verdict |
|-----------|--------|-----------------|---------|-----------------|-------------|------------|------------------|------------|----------|----------------|---------|
| NVNT      | BLE 1M | 2402            | Ant1    | 2310            | -51.37      | 2          | -                | 45.89      | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2402            | Ant1    | 2310            | -58.88      | 2          | 0.59             | 38.97      | Average  | 54             | Pass    |
| NVNT      | BLE 1M | 2402            | Ant1    | 2389.008        | -47.32      | 2          | -                | 49.94      | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2402            | Ant1    | 2389.392        | -58.03      | 2          | 0.59             | 39.82      | Average  | 54             | Pass    |
| NVNT      | BLE 1M | 2402            | Ant1    | 2390            | -49.8       | 2          | -                | 47.46      | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2402            | Ant1    | 2390            | -58.36      | 2          | 0.59             | 39.49      | Average  | 54             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2483.5          | -49.43      | 2          | -                | 47.83      | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2483.5          | -57.71      | 2          | 0.59             | 40.14      | Average  | 54             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2484.424        | -44.3       | 2          | -                | 52.96      | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2483.608        | -57.33      | 2          | 0.59             | 40.52      | Average  | 54             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2500            | -50.43      | 2          | -                | 46.83      | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2500            | -58.09      | 2          | 0.59             | 39.76      | Average  | 54             | Pass    |



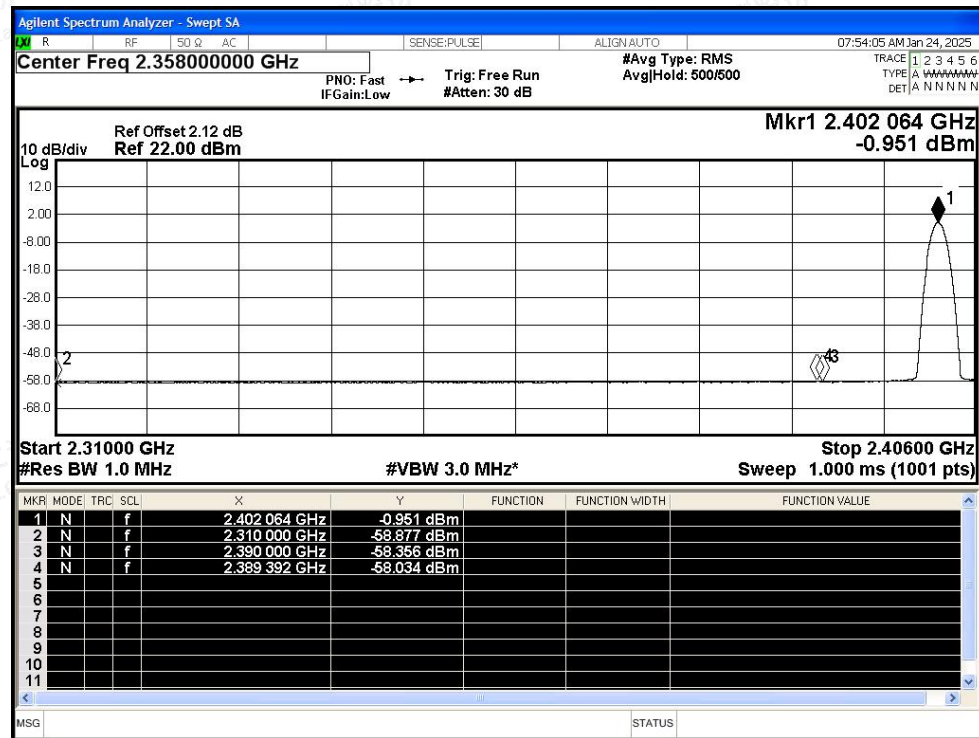


## Test Graphs

## Restrict Band NVNT BLE 1M 2402MHz Ant1 Peak



## Restrict Band NVNT BLE 1M 2402MHz Ant1 Average



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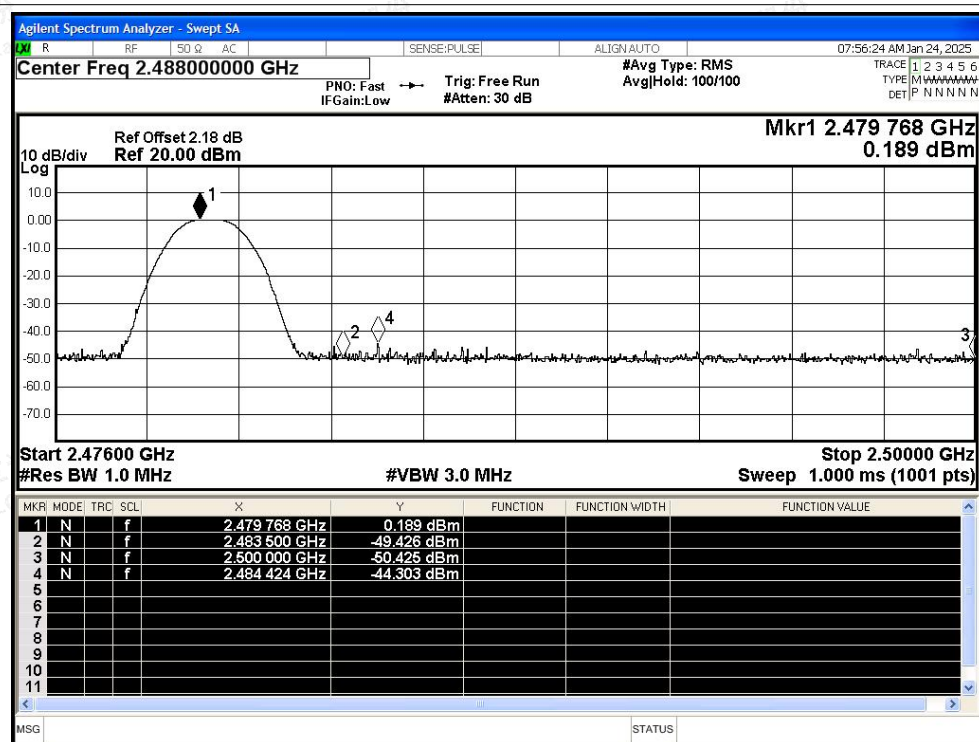
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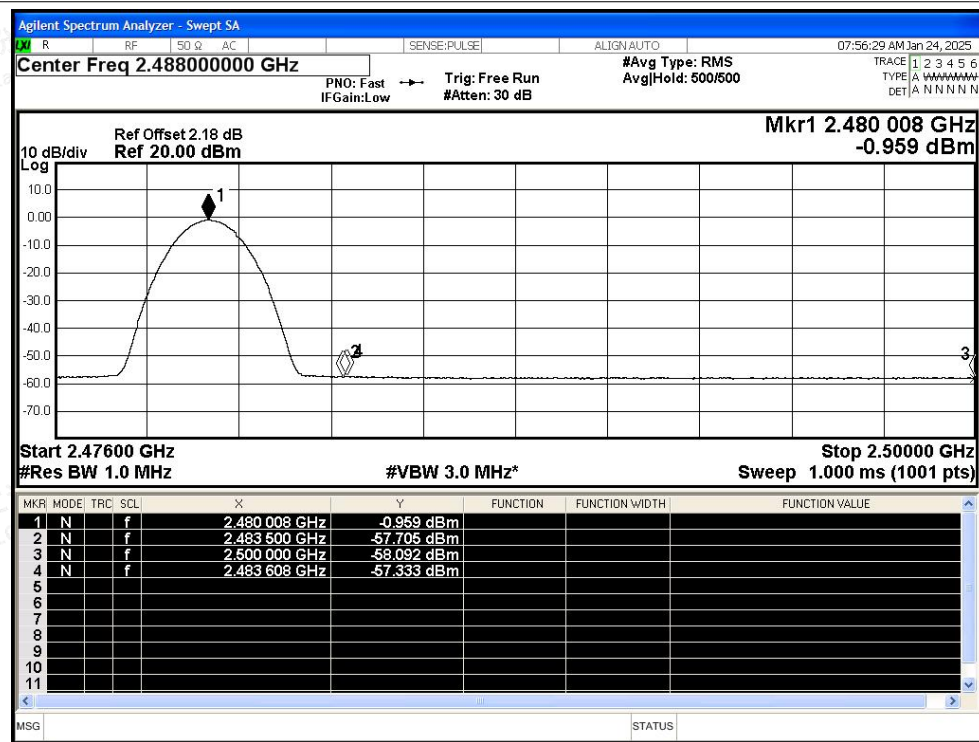
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## Restrict Band NVNT BLE 1M 2480MHz Ant1 Peak



## Restrict Band NVNT BLE 1M 2480MHz Ant1 Average



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