



## Appendix A

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

Product Name: LED Decorative lights

Test Model: SW-LSL-02-400

#### Environmental Conditions

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



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## A.1 -6dB Bandwidth

| Condition | Mode   | Frequency (MHz) | Antenna | -6 dB Bandwidth (MHz) | Limit -6 dB Bandwidth (MHz) | Verdict |
|-----------|--------|-----------------|---------|-----------------------|-----------------------------|---------|
| NVNT      | BLE 1M | 2402            | Ant1    | 0.651                 | $\geq 0.5$                  | Pass    |
| NVNT      | BLE 1M | 2440            | Ant1    | 0.648                 | $\geq 0.5$                  | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 0.66                  | $\geq 0.5$                  | Pass    |



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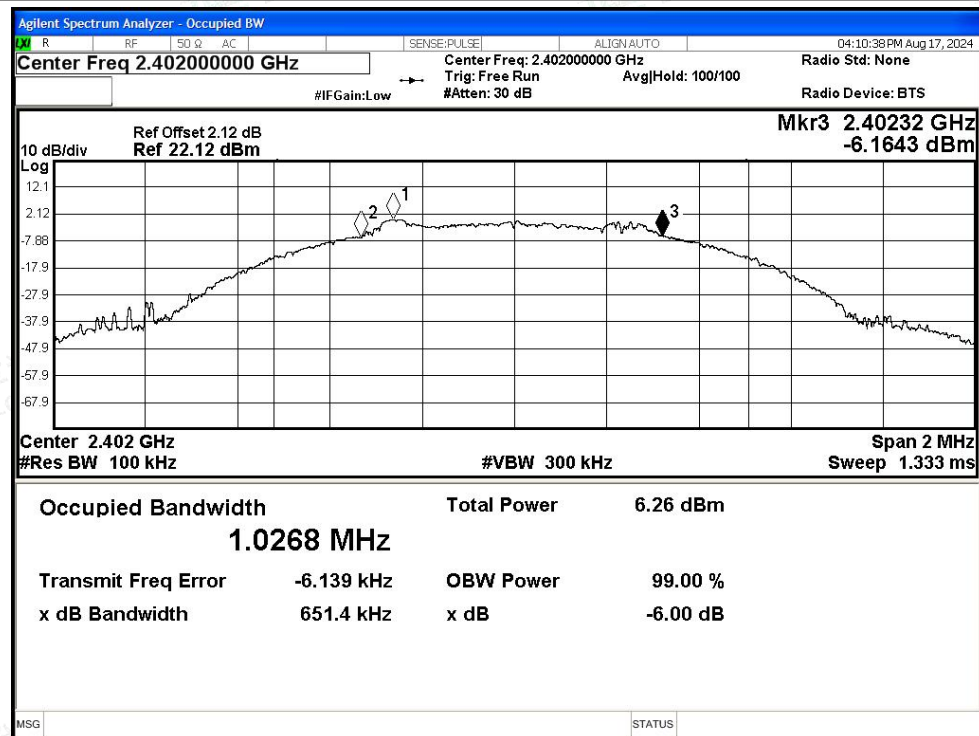
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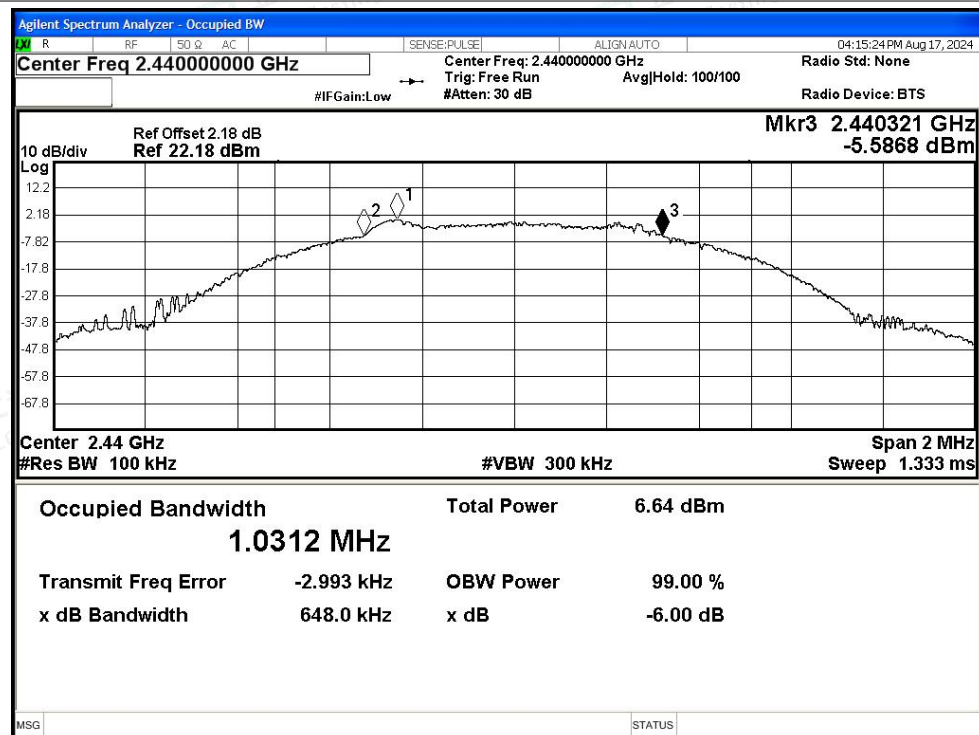


## Test Graphs

-6dB Bandwidth NVNT BLE 1M 2402MHz Ant1



-6dB Bandwidth NVNT BLE 1M 2440MHz Ant1

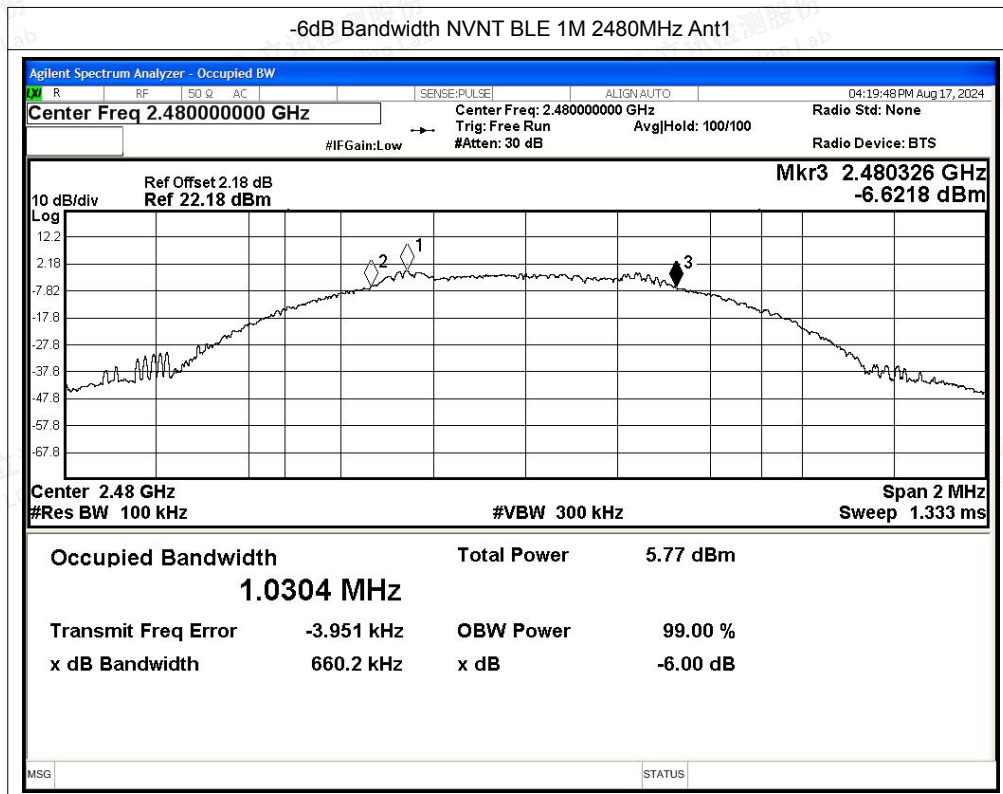


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## A.2 Maximum peak Conducted Output Power

| Condition | Mode   | Frequency (MHz) | Antenna | Conducted Power (dBm) | Limit (dBm) | Verdict |
|-----------|--------|-----------------|---------|-----------------------|-------------|---------|
| NVNT      | BLE 1M | 2402            | Ant1    | 0.59                  | 30          | Pass    |
| NVNT      | BLE 1M | 2440            | Ant1    | 0.95                  | 30          | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 0.2                   | 30          | Pass    |



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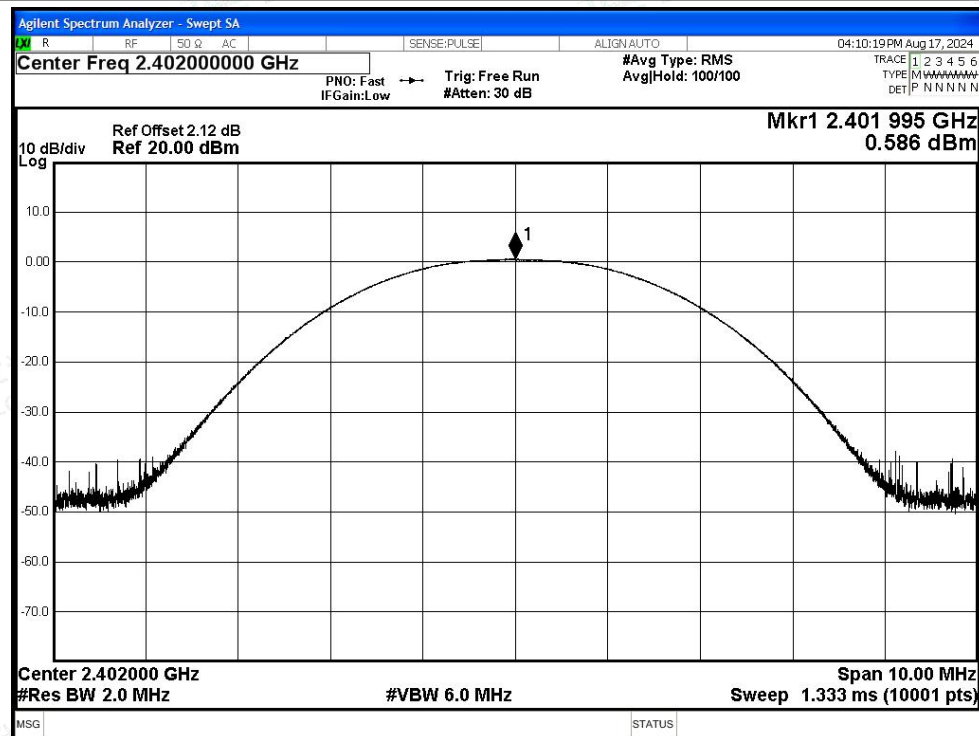
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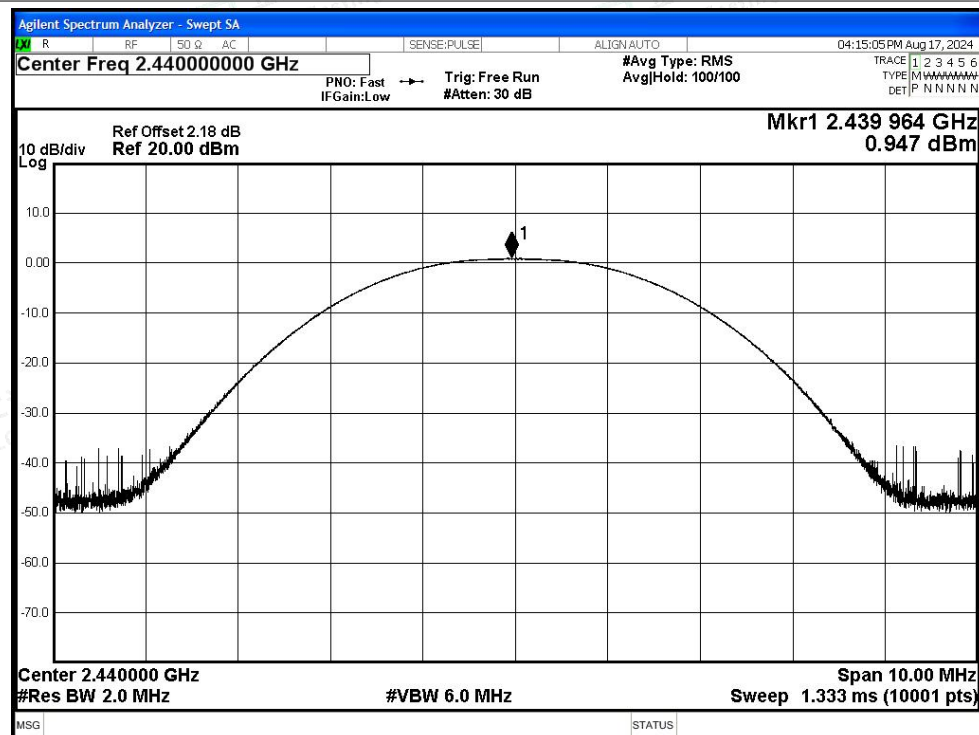


## Test Graphs

Power NVNT BLE 1M 2402MHz Ant1



Power NVNT BLE 1M 2440MHz Ant1

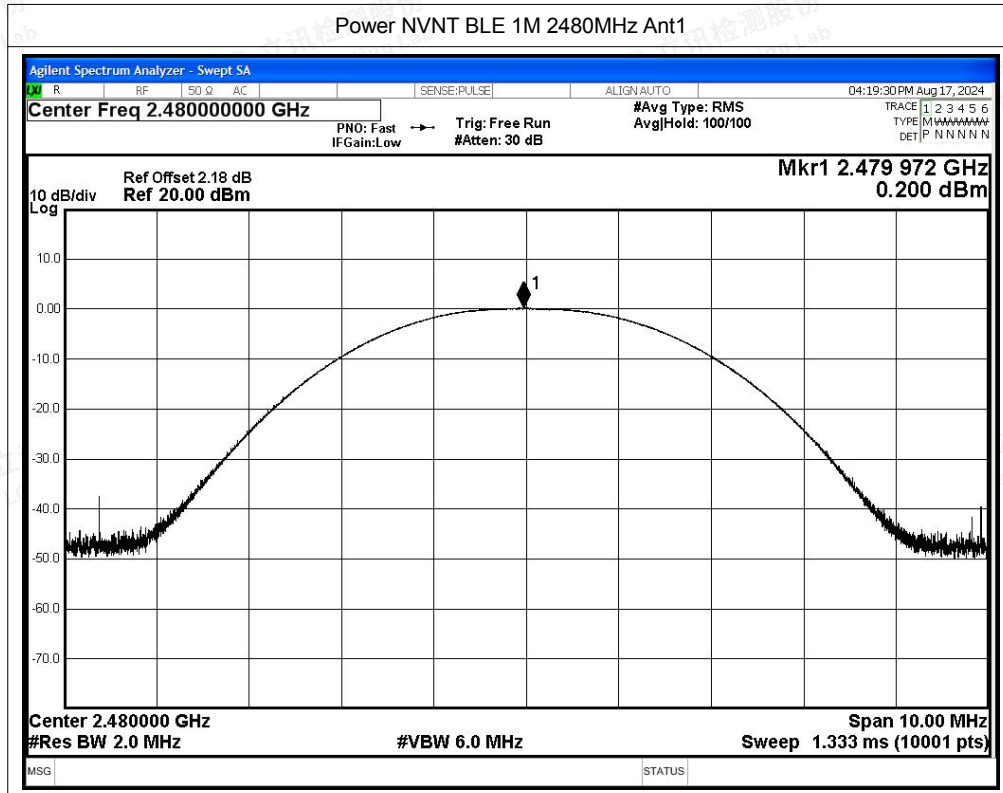


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### A.3 Maximum Power Spectral Density Level

| Condition | Mode   | Frequency (MHz) | Antenna | Conducted PSD (dBm/3kHz) | Limit (dBm/3kHz) | Verdict |
|-----------|--------|-----------------|---------|--------------------------|------------------|---------|
| NVNT      | BLE 1M | 2402            | Ant1    | -16.19                   | 8                | Pass    |
| NVNT      | BLE 1M | 2440            | Ant1    | -15.79                   | 8                | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | -16.84                   | 8                | Pass    |



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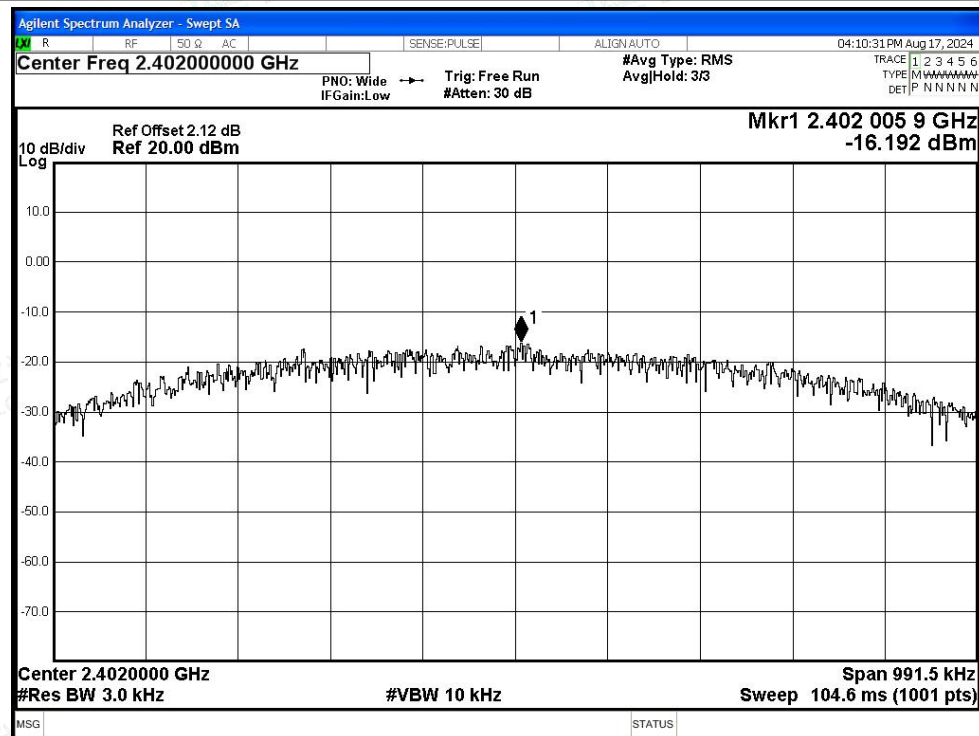
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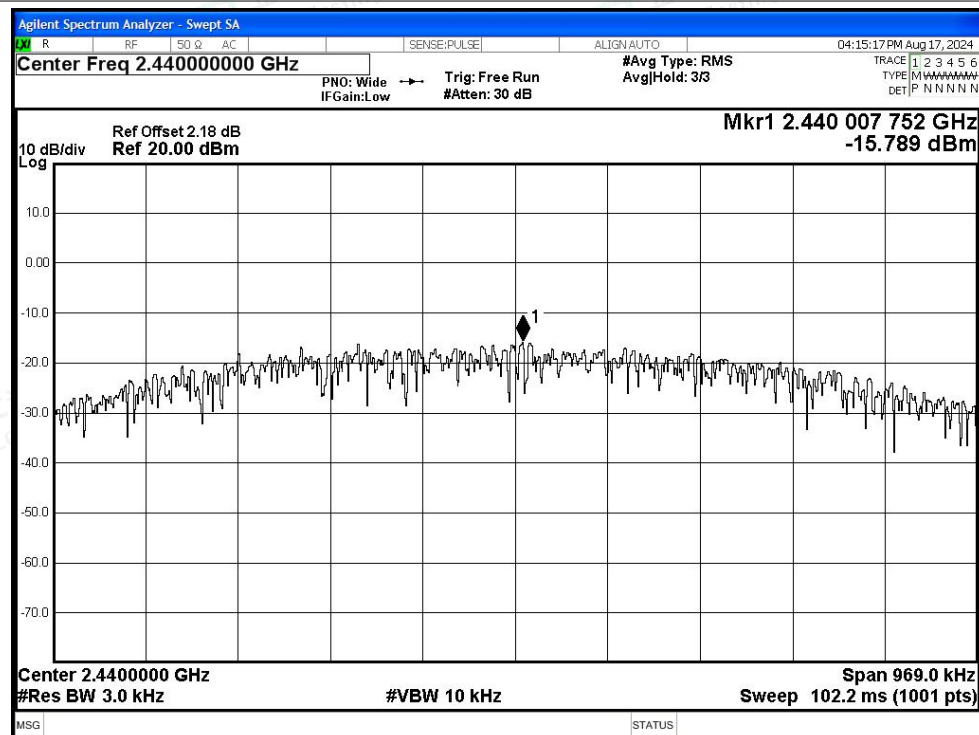


## Test Graphs

PSD NVNT BLE 1M 2402MHz Ant1



PSD NVNT BLE 1M 2440MHz Ant1

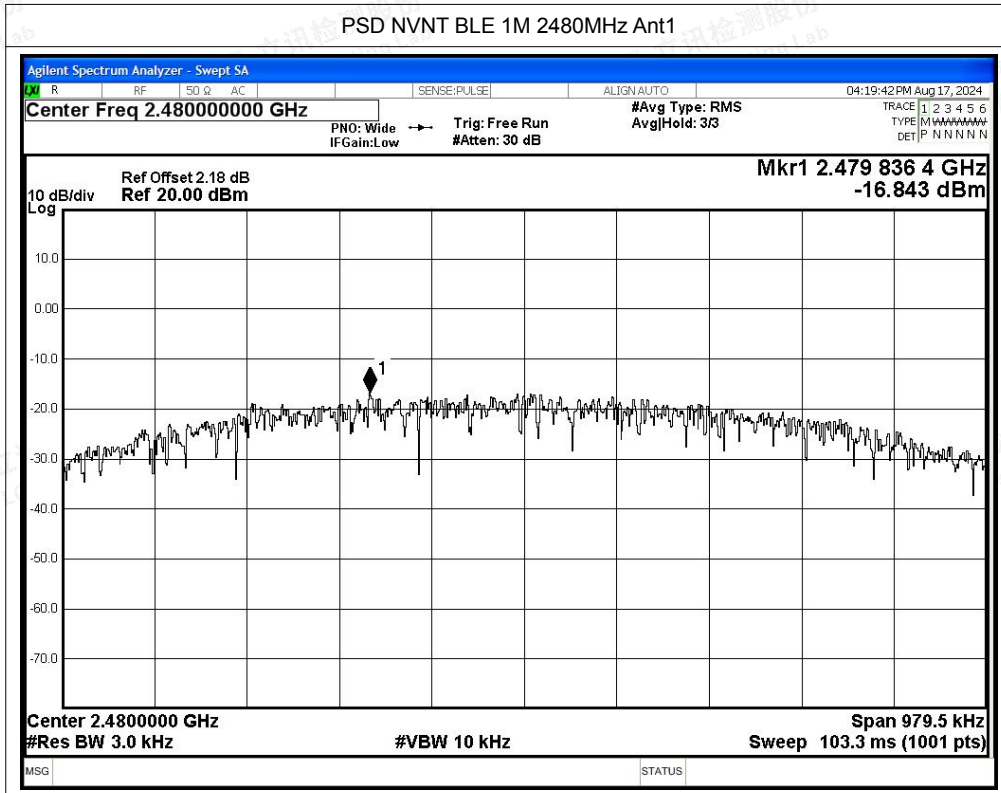


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## A.4 Band Edge

| Condition | Mode   | Frequency (MHz) | Antenna | Max Value (dBc) | Limit (dBc) | Verdict |
|-----------|--------|-----------------|---------|-----------------|-------------|---------|
| NVNT      | BLE 1M | 2402            | Ant1    | -56.12          | -20         | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | -56.39          | -20         | Pass    |



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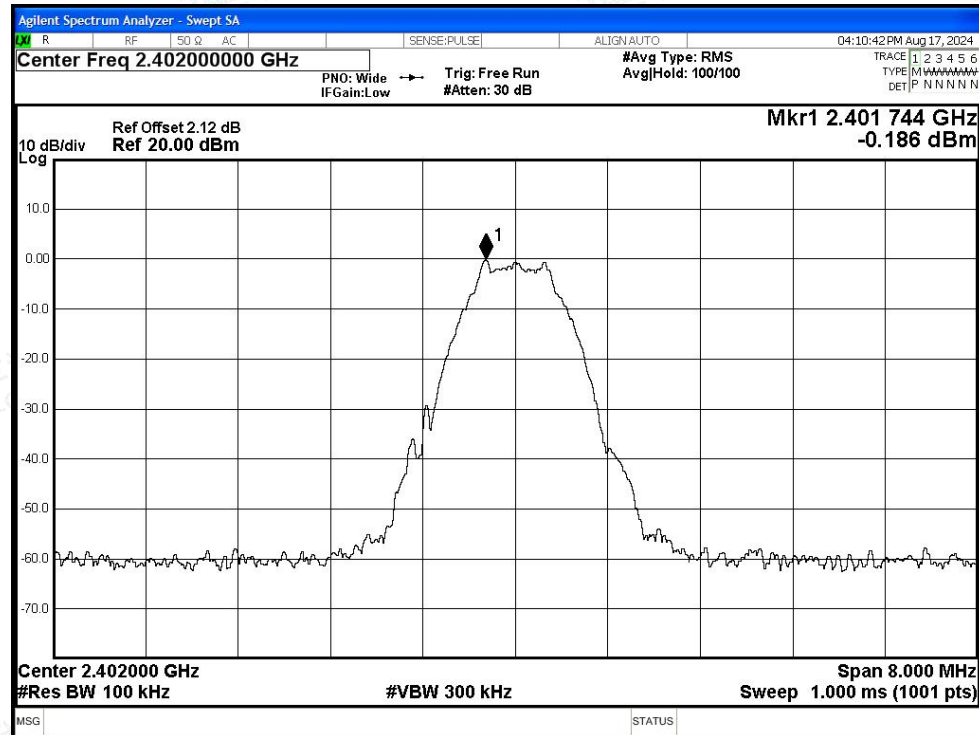
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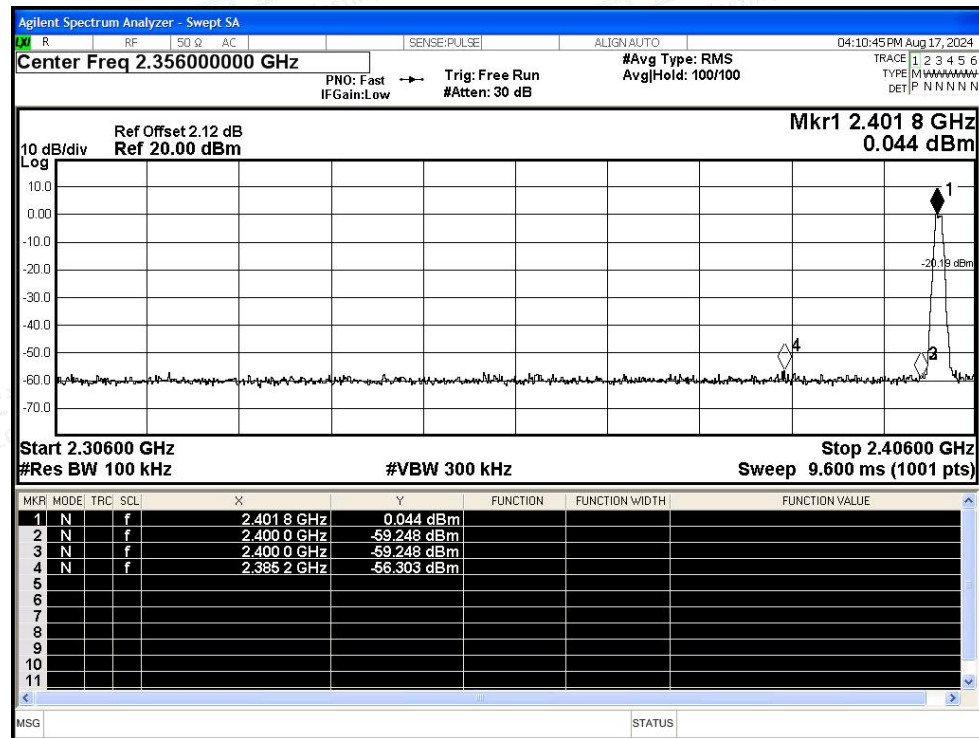


## Test Graphs

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



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



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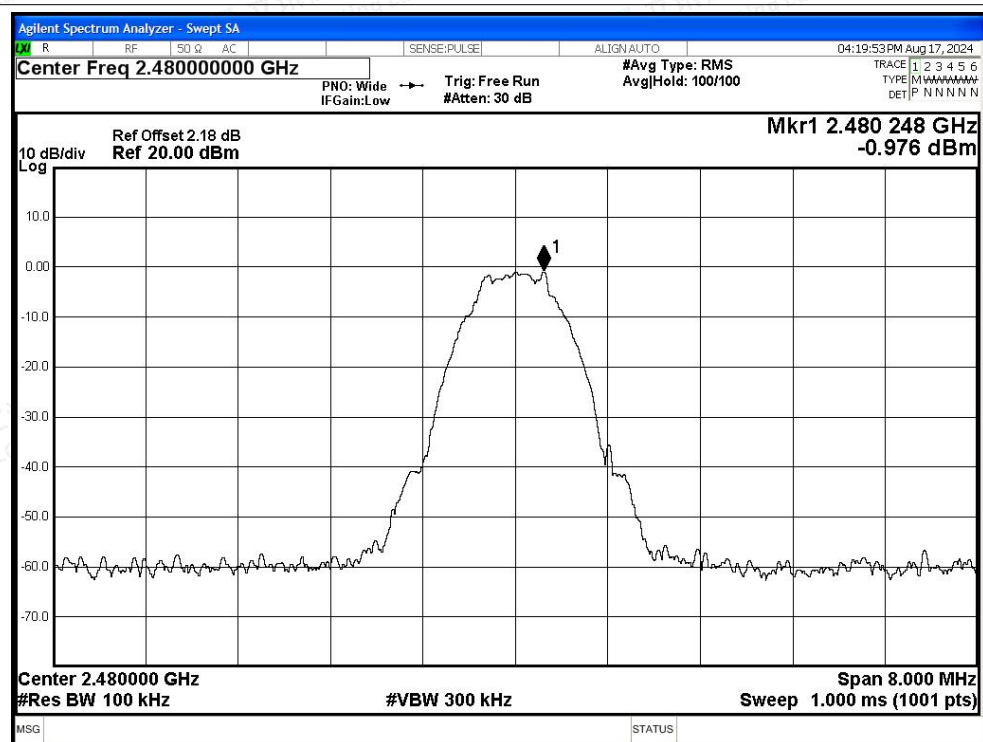
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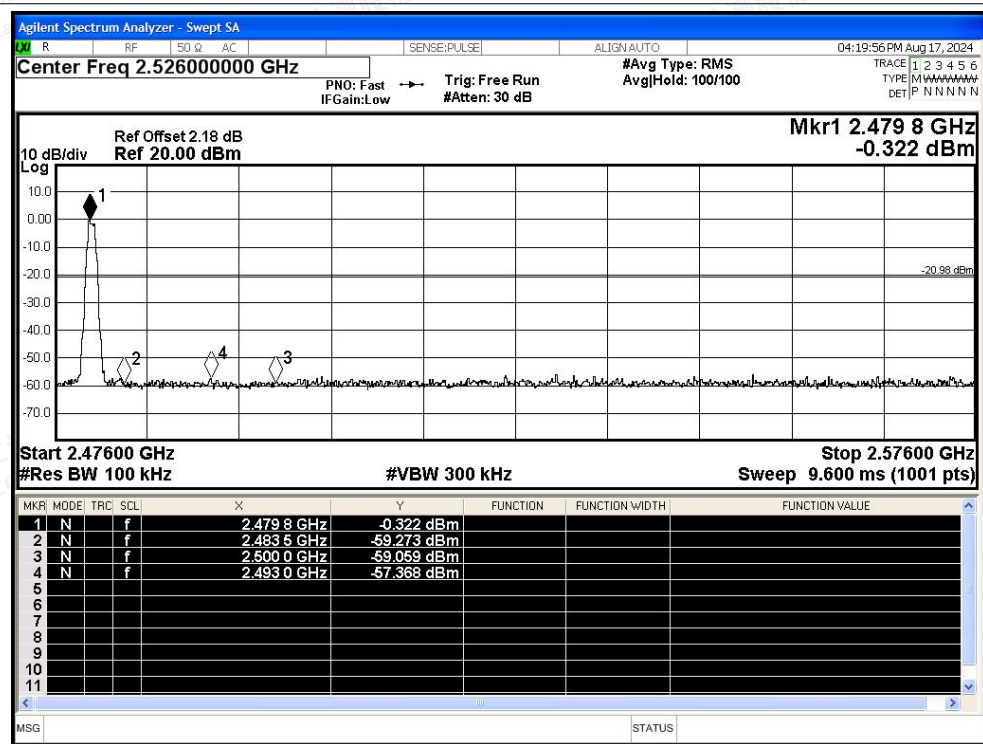
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## Band Edge NVNT BLE 1M 2480MHz Ant1 Ref



## 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    | -55.24          | -20         | Pass    |
| NVNT      | BLE 1M | 2440            | Ant1    | -54.49          | -20         | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | -55.01          | -20         | Pass    |



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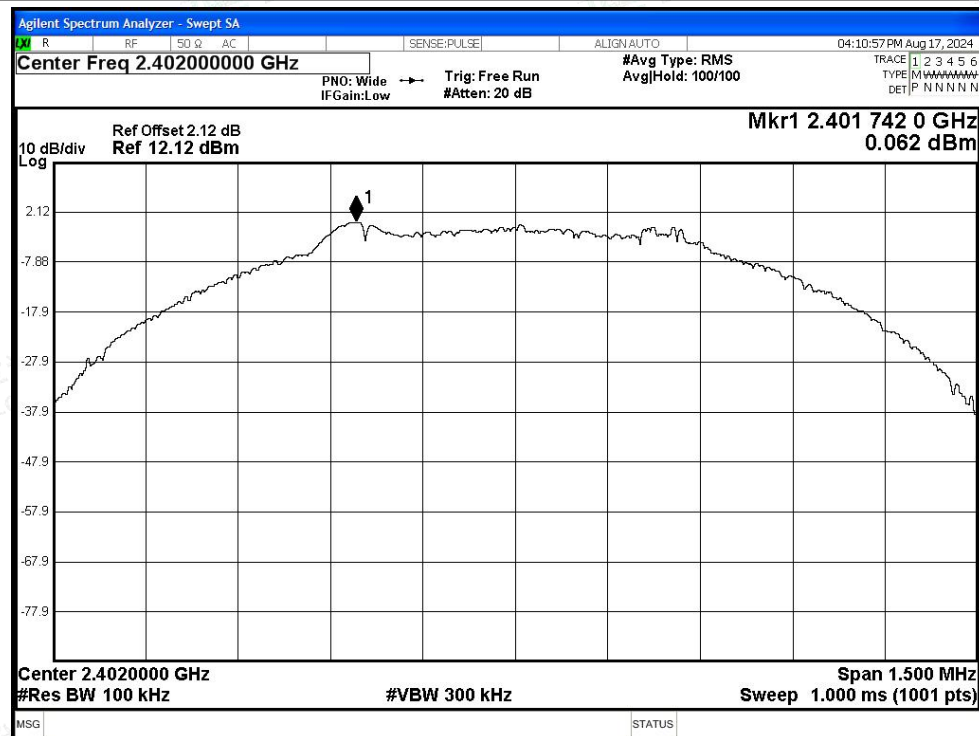
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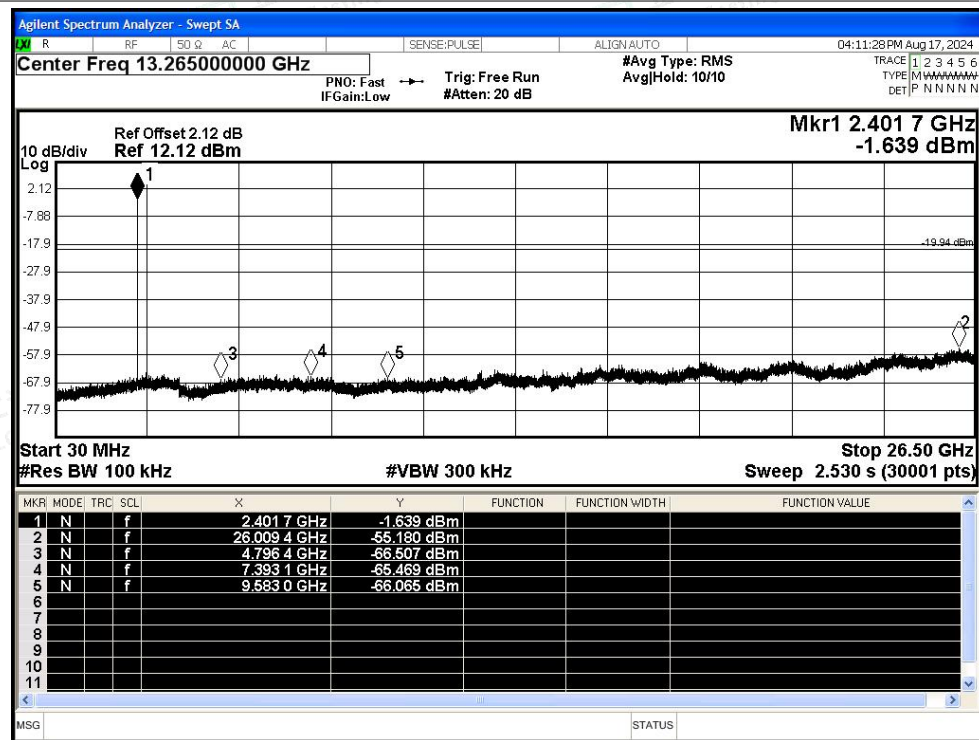


## Test Graphs

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



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



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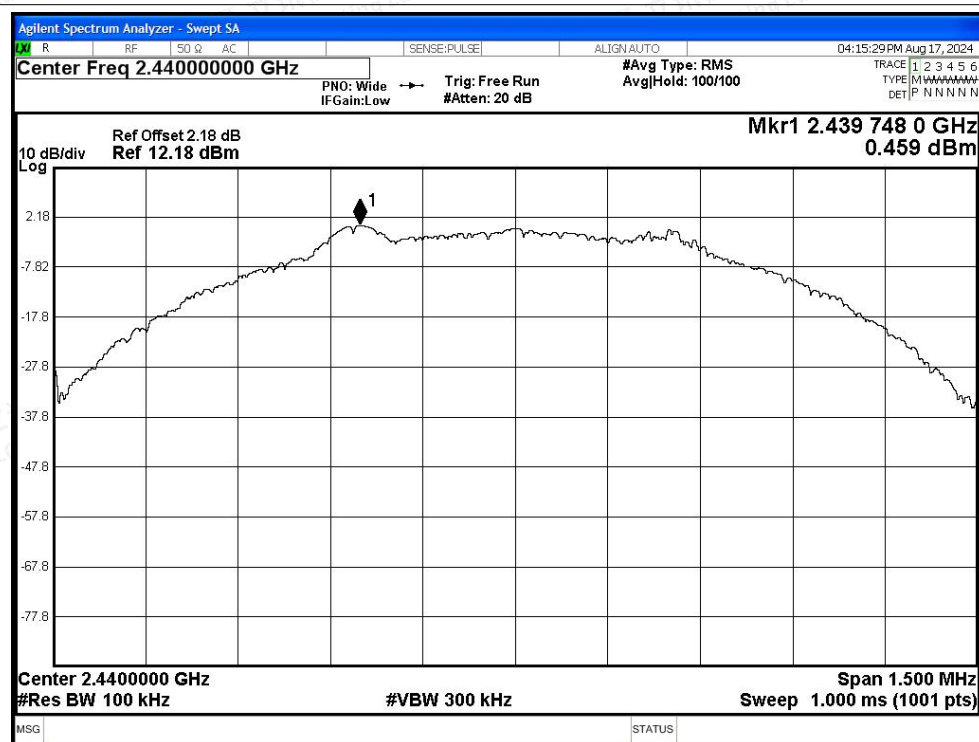
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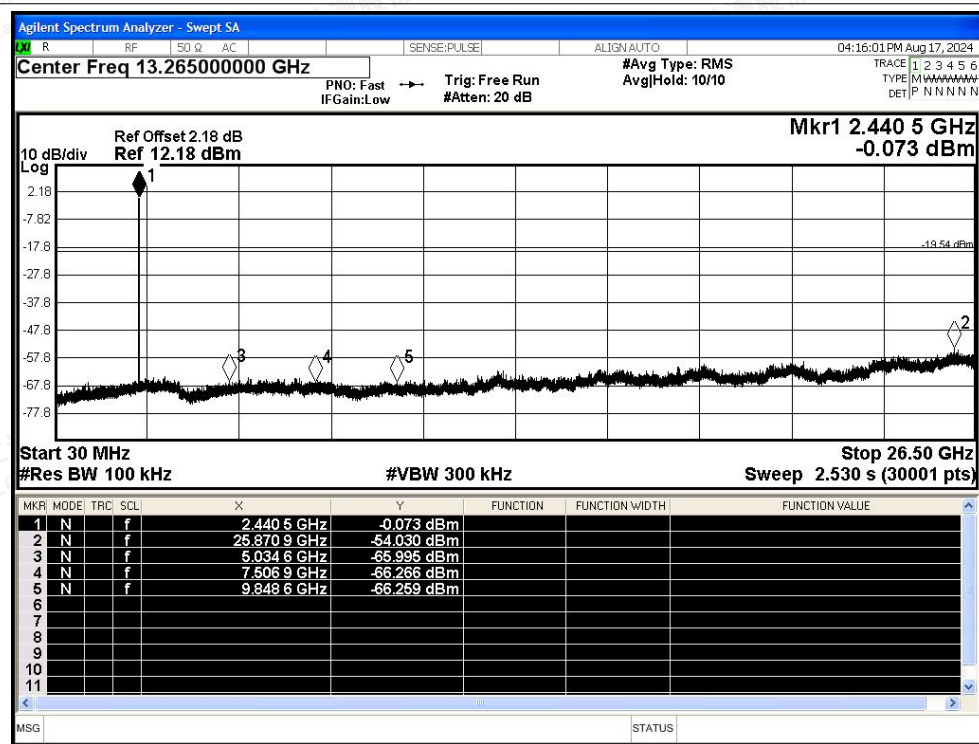
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## Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Ref



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



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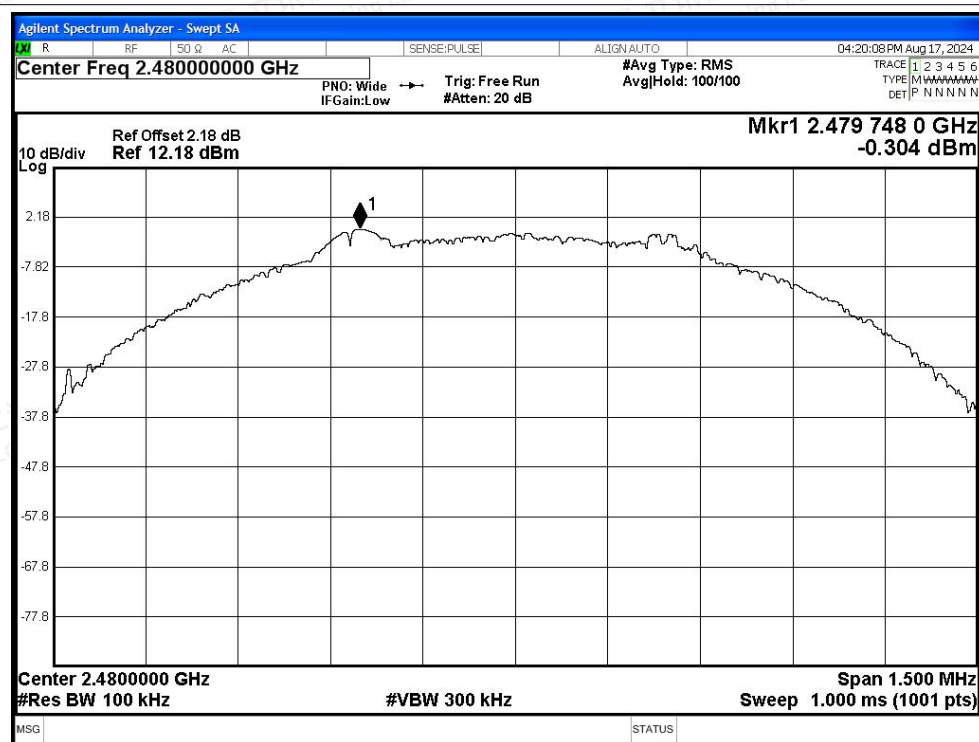
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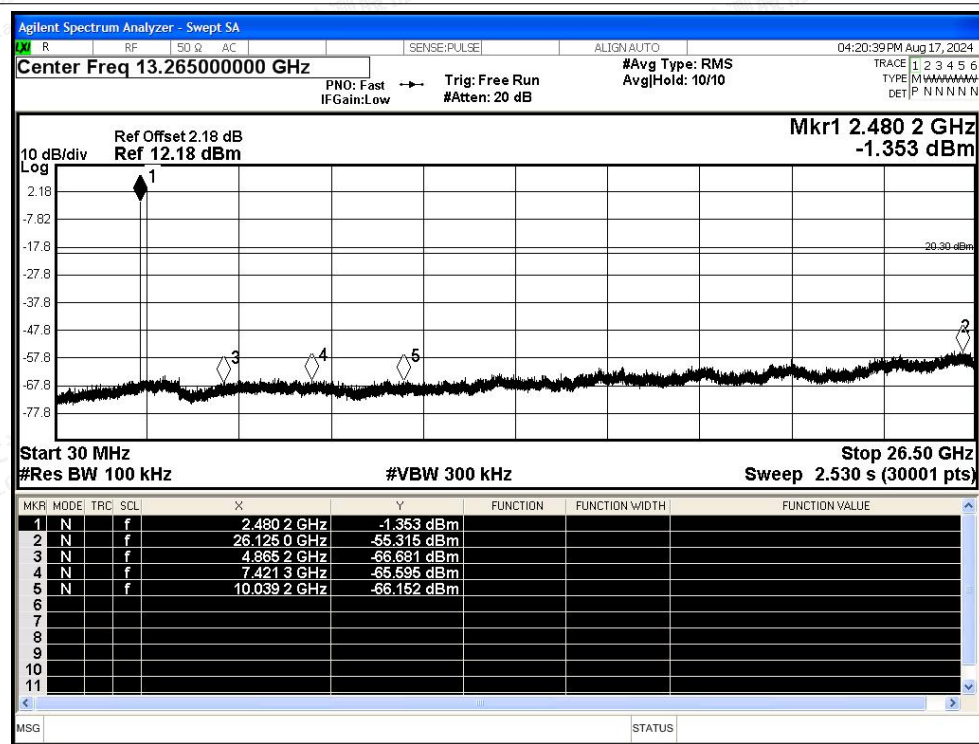




## Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Ref



## 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    | 87.41          | 0.58                   | 0.61      |
| NVNT      | BLE 1M | 2480            | Ant1    | 87.39          | 0.59                   | 0.61      |



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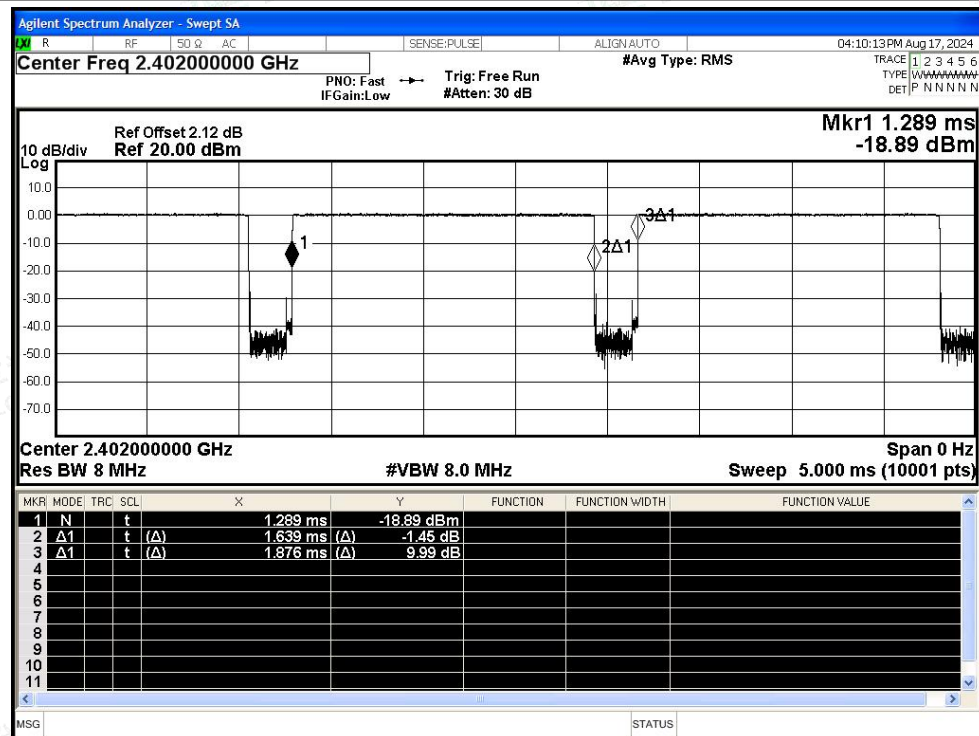
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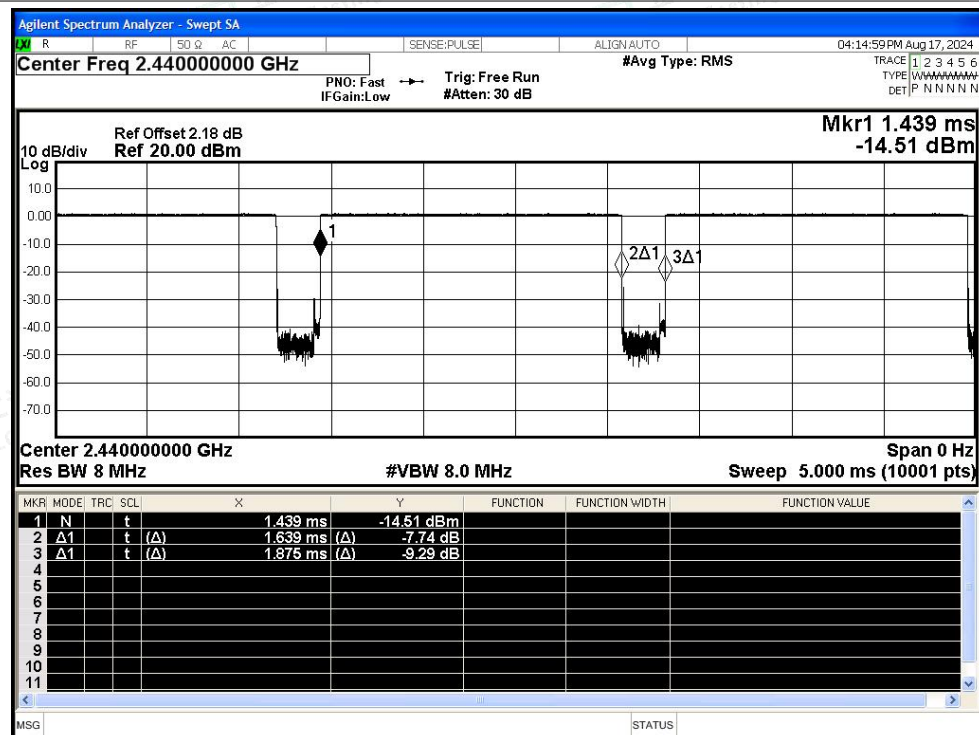


## Test Graphs

## Duty Cycle NVNT BLE 1M 2402MHz Ant1



## Duty Cycle NVNT BLE 1M 2440MHz Ant1

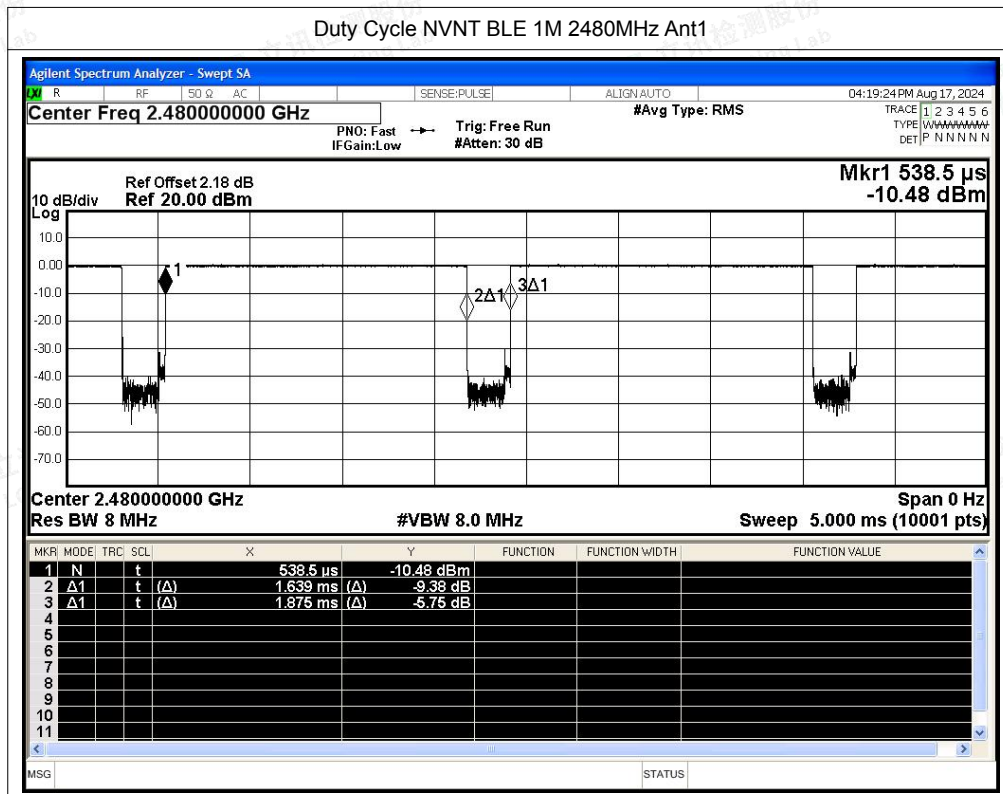


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## A.7 Restrict Band

| 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         | 2.0        | -                | 46.26      | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2402            | Ant1    | 2310            | -58.5       | 2.0        | 0.59             | 39.35      | Average  | 54             | Pass    |
| NVNT      | BLE 1M | 2402            | Ant1    | 2318.352        | -46.69      | 2.0        | -                | 50.57      | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2402            | Ant1    | 2383.152        | -57.68      | 2.0        | 0.59             | 40.17      | Average  | 54             | Pass    |
| NVNT      | BLE 1M | 2402            | Ant1    | 2390            | -50.79      | 2.0        | -                | 46.47      | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2402            | Ant1    | 2390            | -58.44      | 2.0        | 0.59             | 39.41      | Average  | 54             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2483.5          | -50.58      | 2.0        | -                | 46.68      | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2483.5          | -57.59      | 2.0        | 0.59             | 40.26      | Average  | 54             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2486.272        | -46.9       | 2.0        | -                | 50.36      | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2485.552        | -57         | 2.0        | 0.59             | 40.85      | Average  | 54             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2500            | -49.99      | 2.0        | -                | 47.27      | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2500            | -58.39      | 2.0        | 0.59             | 39.46      | Average  | 54             | Pass    |



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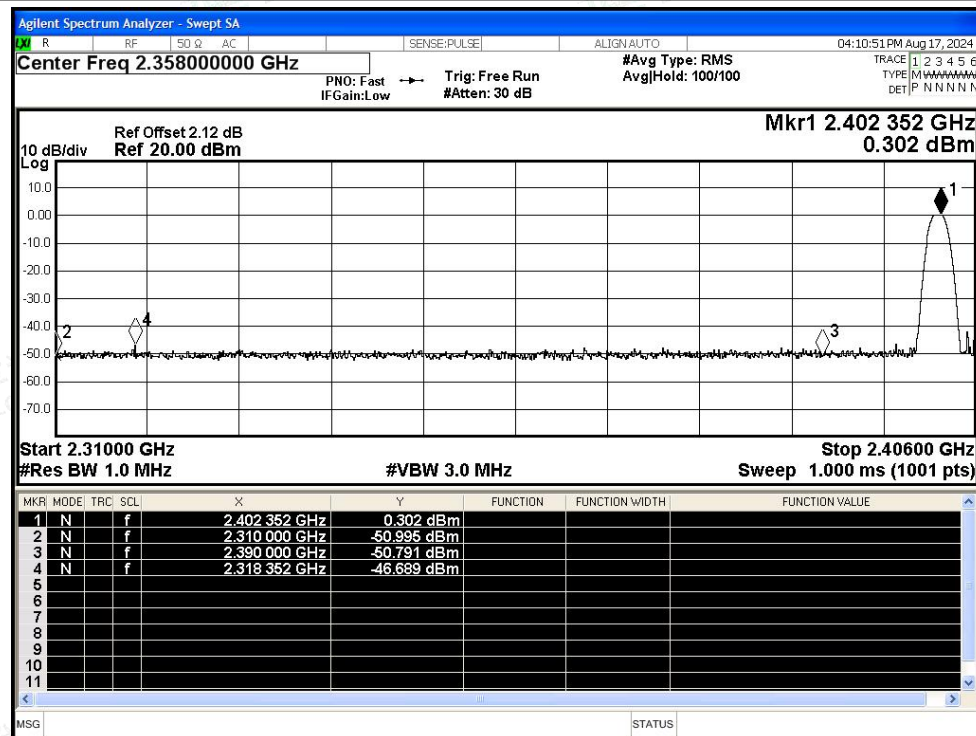
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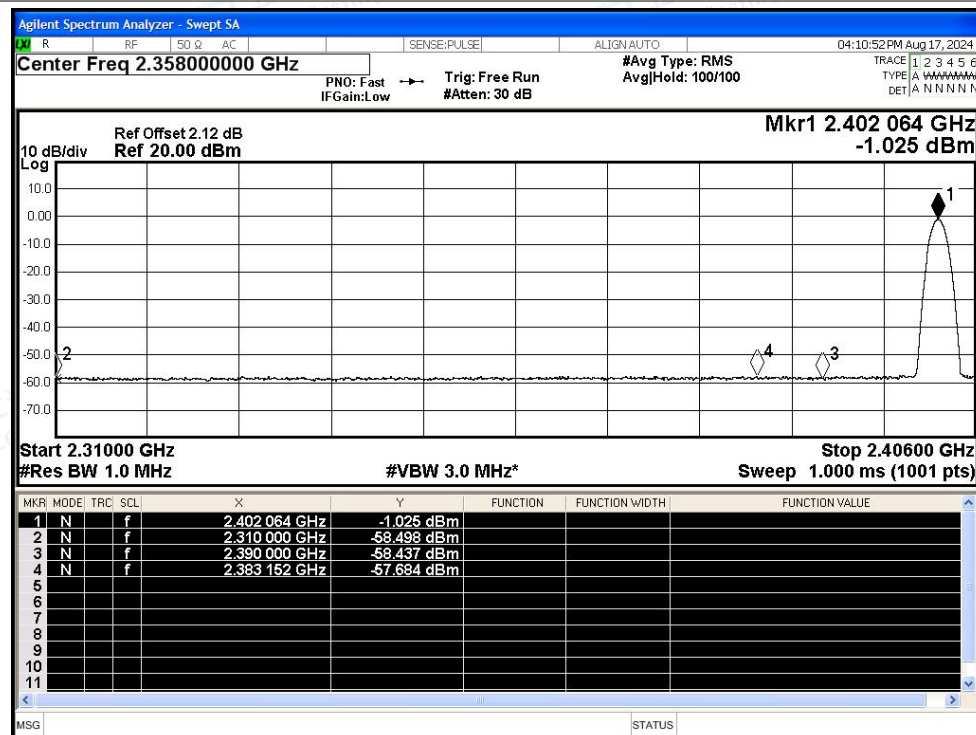


## Test Graphs

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



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



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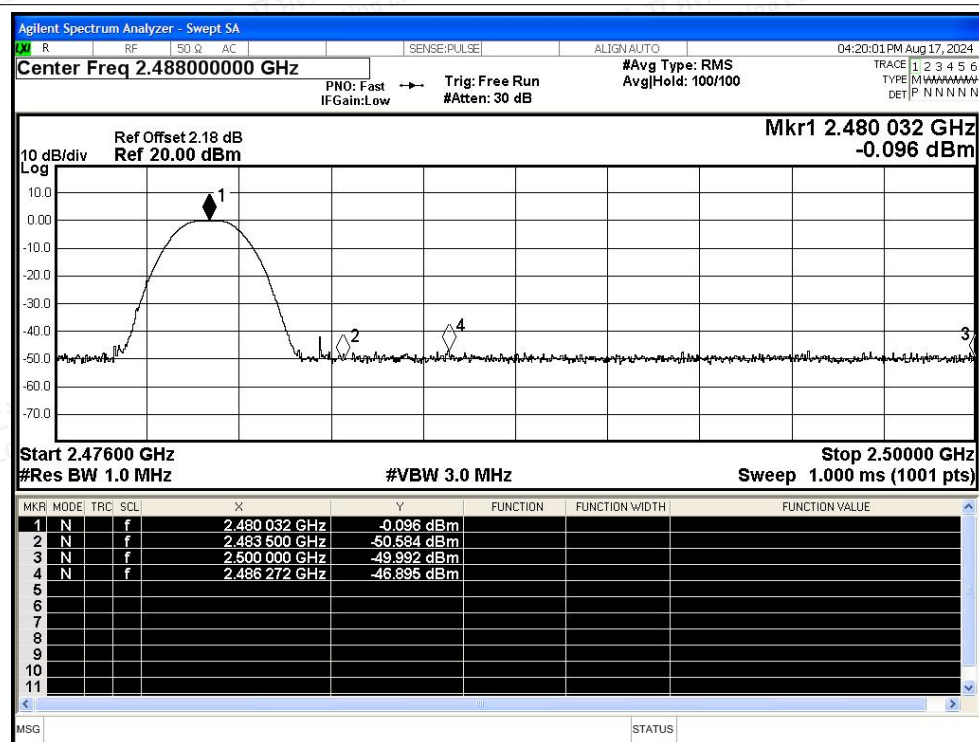
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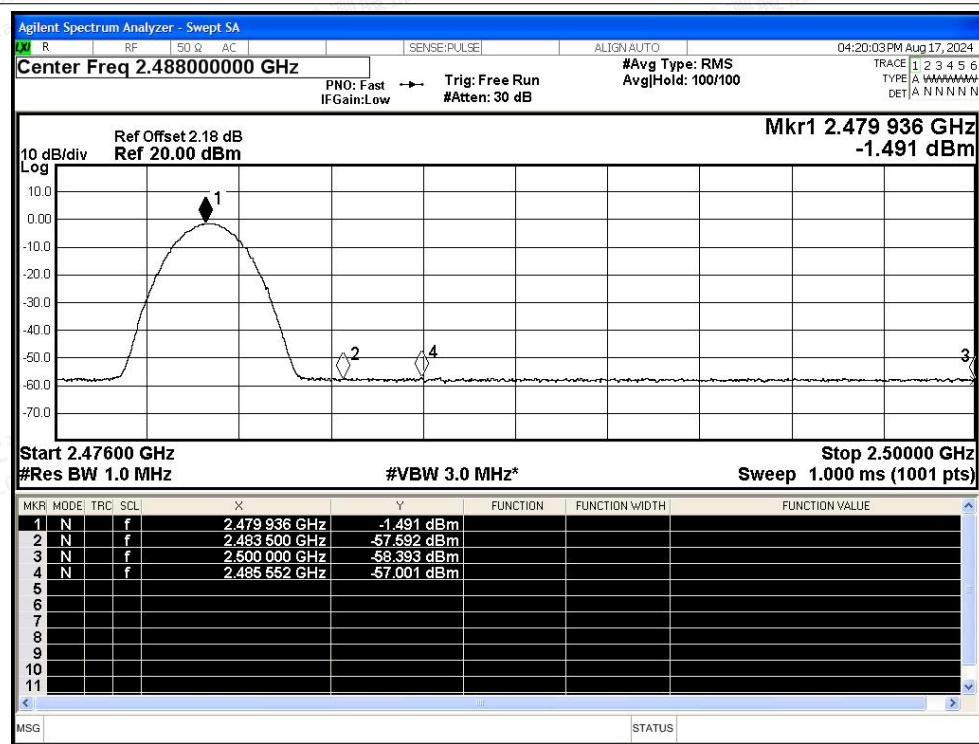




## Restrict Band NVNT BLE 1M 2480MHz Ant1 Peak



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



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