



## Appendix A

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

Product Name: Wireless controller

Test Model: YH-6183

#### Environmental Conditions

|                    |                               |
|--------------------|-------------------------------|
| Temperature:       | 23.1° C                       |
| Relative Humidity: | 52.3%                         |
| ATM Pressure:      | 100.0 kPa                     |
| Test Engineer:     | <i>Jay Luo</i><br>Jay Luo     |
| Supervised by:     | <i>Nick Peng</i><br>Nick Peng |





## A.1 -6dB Bandwidth

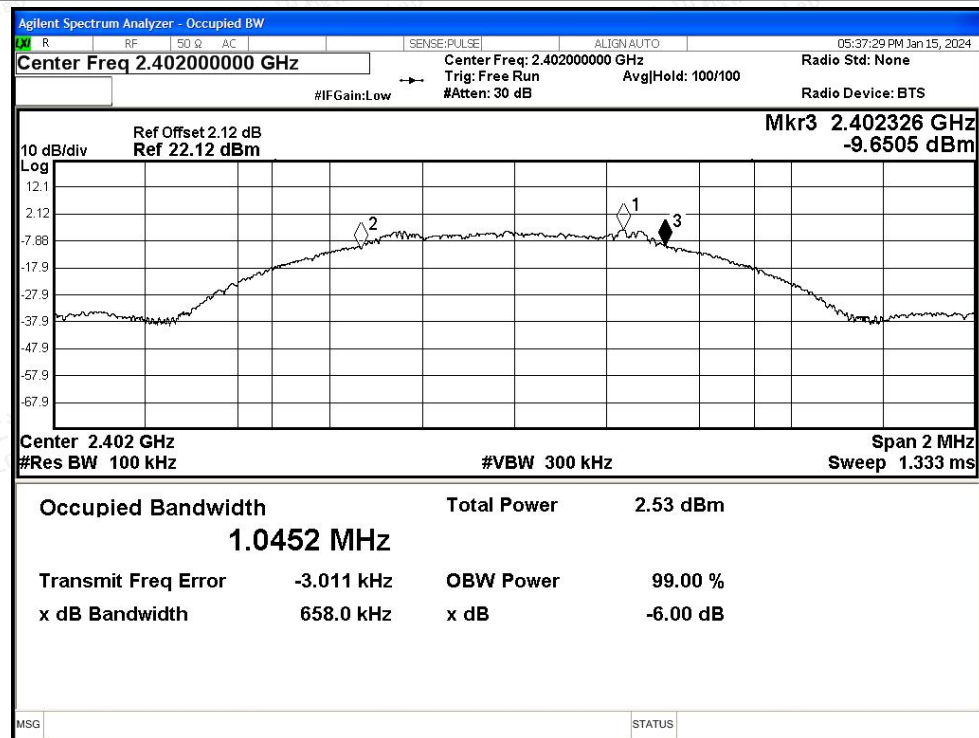
| Condition | Mode   | Frequency (MHz) | Antenna | -6 dB Bandwidth (MHz) | Limit -6 dB Bandwidth (MHz) | Verdict |
|-----------|--------|-----------------|---------|-----------------------|-----------------------------|---------|
| NVNT      | BLE 1M | 2402            | Ant1    | 0.658                 | $\geq 0.5$                  | Pass    |
| NVNT      | BLE 1M | 2440            | Ant1    | 0.667                 | $\geq 0.5$                  | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 0.661                 | $\geq 0.5$                  | Pass    |



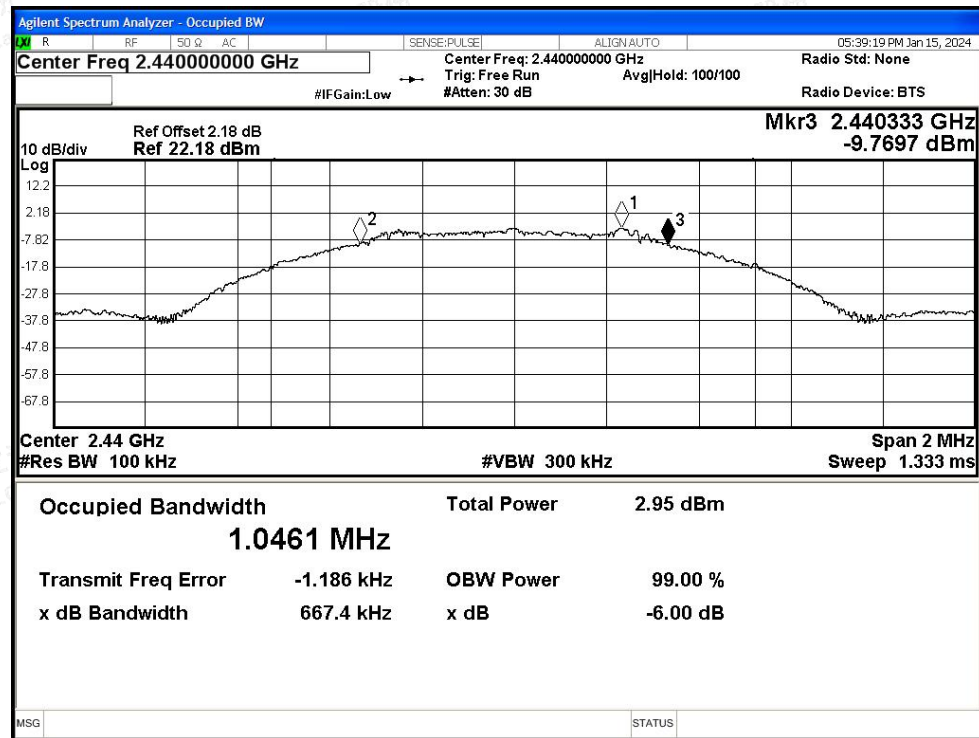


## Test Graphs

-6dB Bandwidth NVNT BLE 1M 2402MHz Ant1



-6dB Bandwidth NVNT BLE 1M 2440MHz Ant1

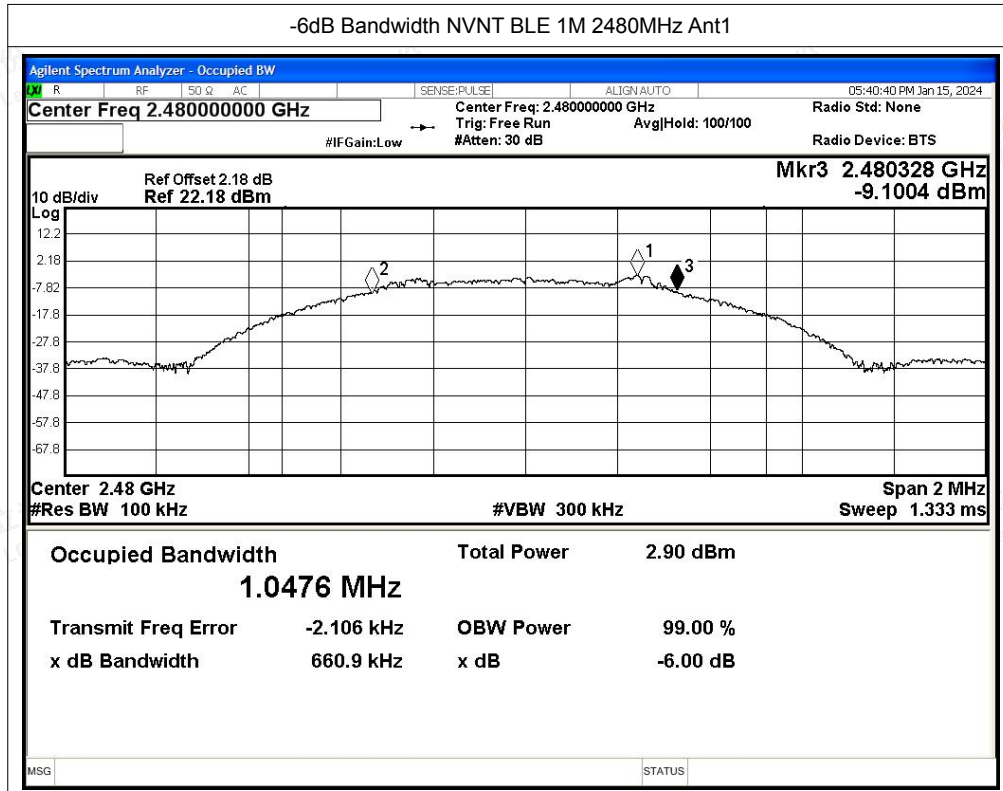


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## A.2 Maximum Conducted Output Power

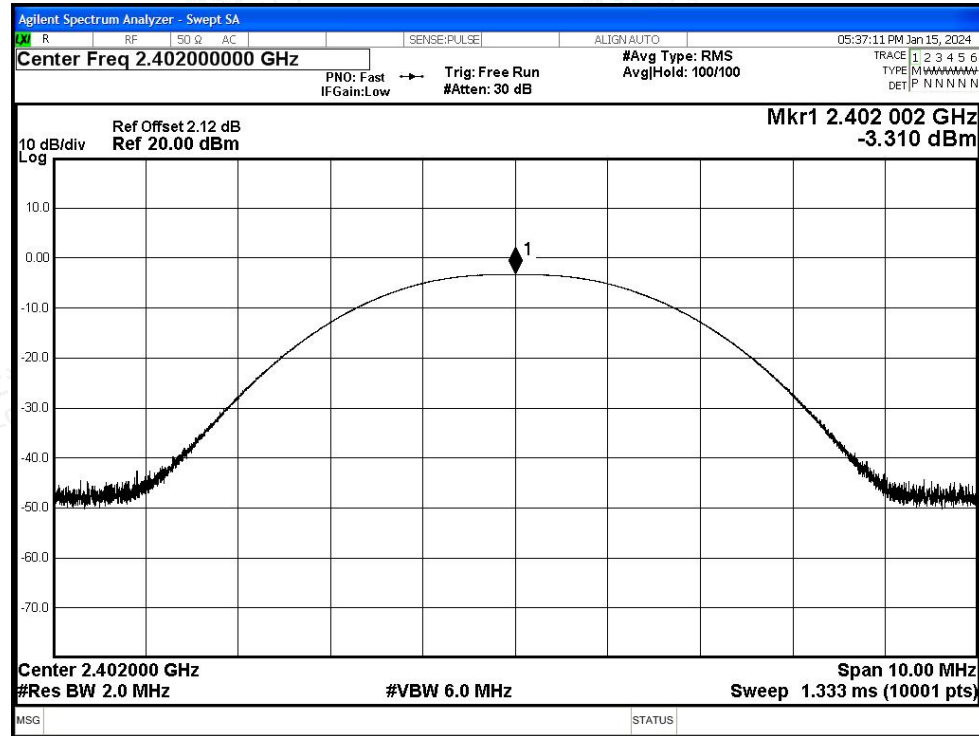
| Condition | Mode   | Frequency (MHz) | Antenna | Total Power (dBm) | Limit (dBm) | Verdict |
|-----------|--------|-----------------|---------|-------------------|-------------|---------|
| NVNT      | BLE 1M | 2402            | Ant1    | -3.31             | 30          | Pass    |
| NVNT      | BLE 1M | 2440            | Ant1    | -2.92             | 30          | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | -3.03             | 30          | Pass    |



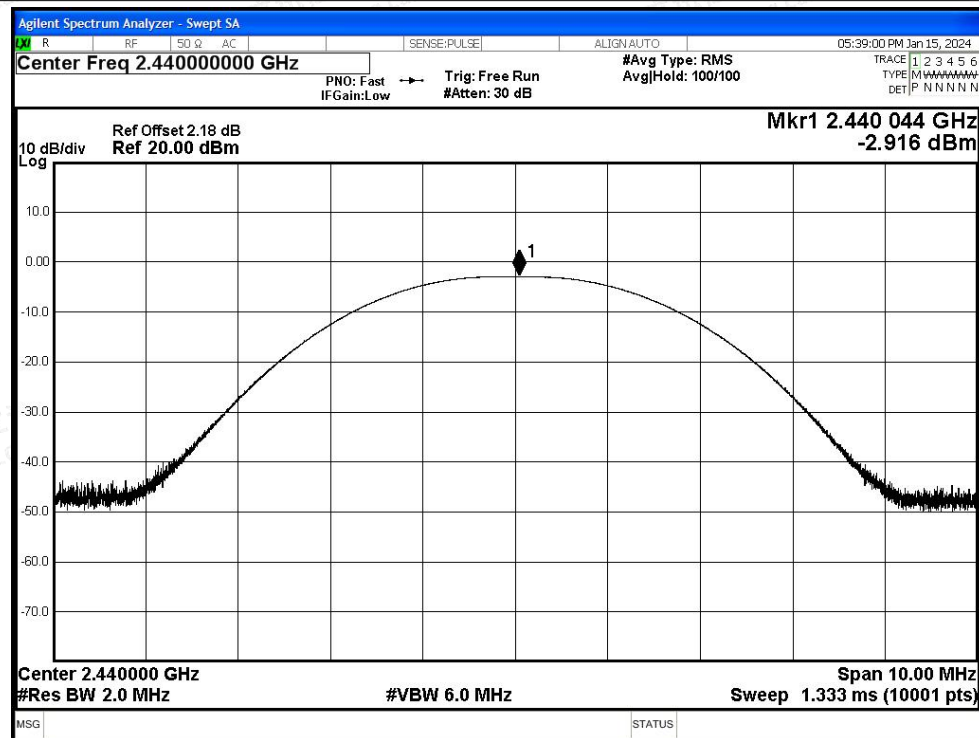


## Test Graphs

Power NVNT BLE 1M 2402MHz Ant1



Power NVNT BLE 1M 2440MHz Ant1

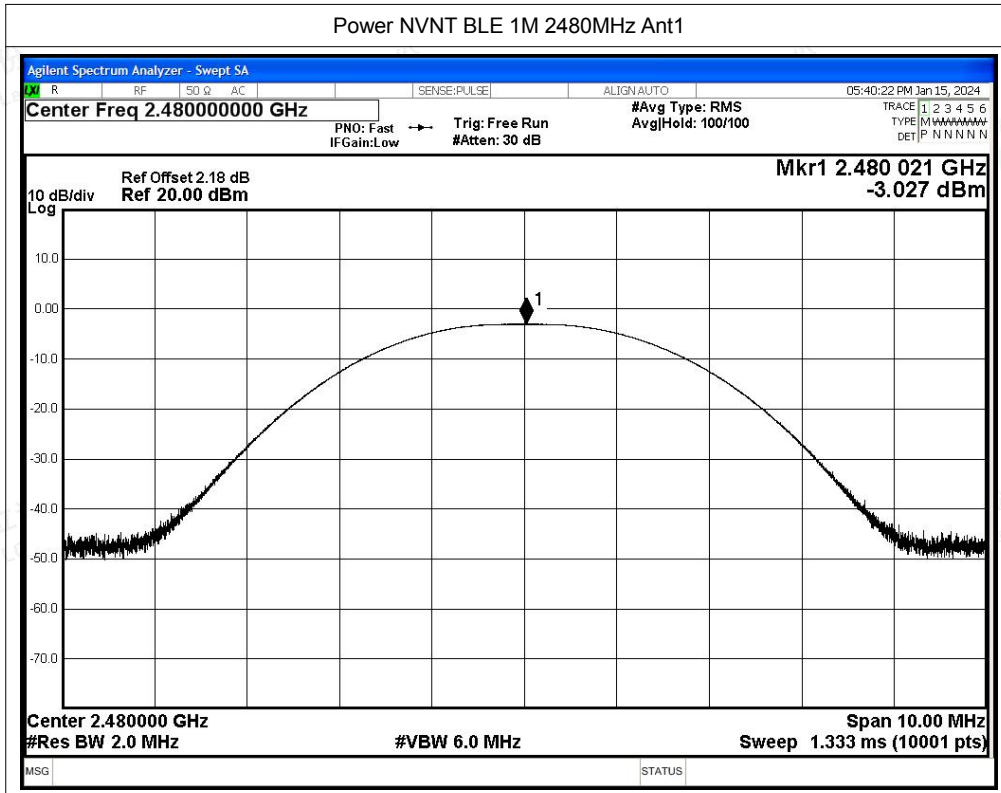


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### A.3 Maximum Power Spectral Density Level

| Condition | Mode   | Frequency (MHz) | Antenna | Total PSD (dBm/3kHz) | Limit (dBm/3kHz) | Verdict |
|-----------|--------|-----------------|---------|----------------------|------------------|---------|
| NVNT      | BLE 1M | 2402            | Ant1    | -19.88               | 8                | Pass    |
| NVNT      | BLE 1M | 2440            | Ant1    | -19.52               | 8                | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | -19.29               | 8                | Pass    |

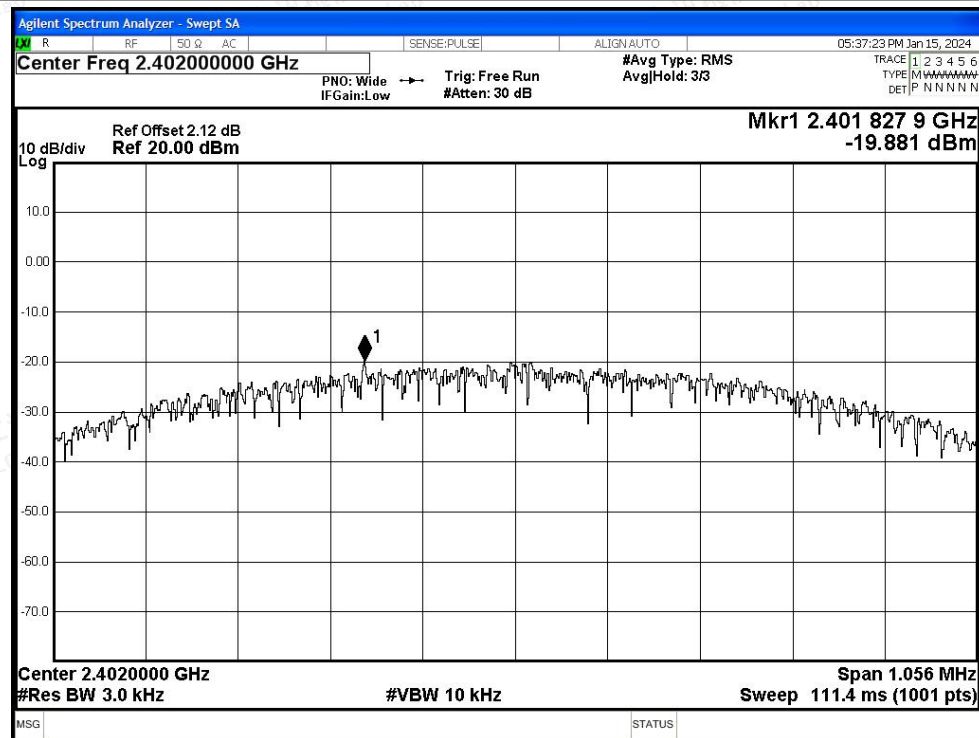




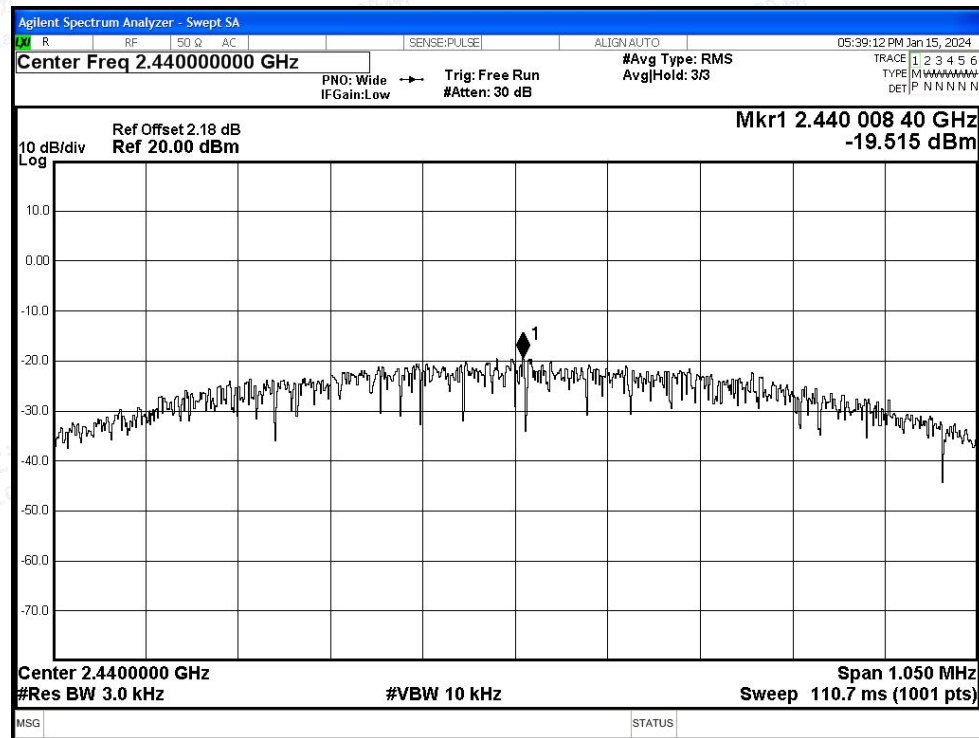


## Test Graphs

PSD NVNT BLE 1M 2402MHz Ant1



PSD NVNT BLE 1M 2440MHz Ant1

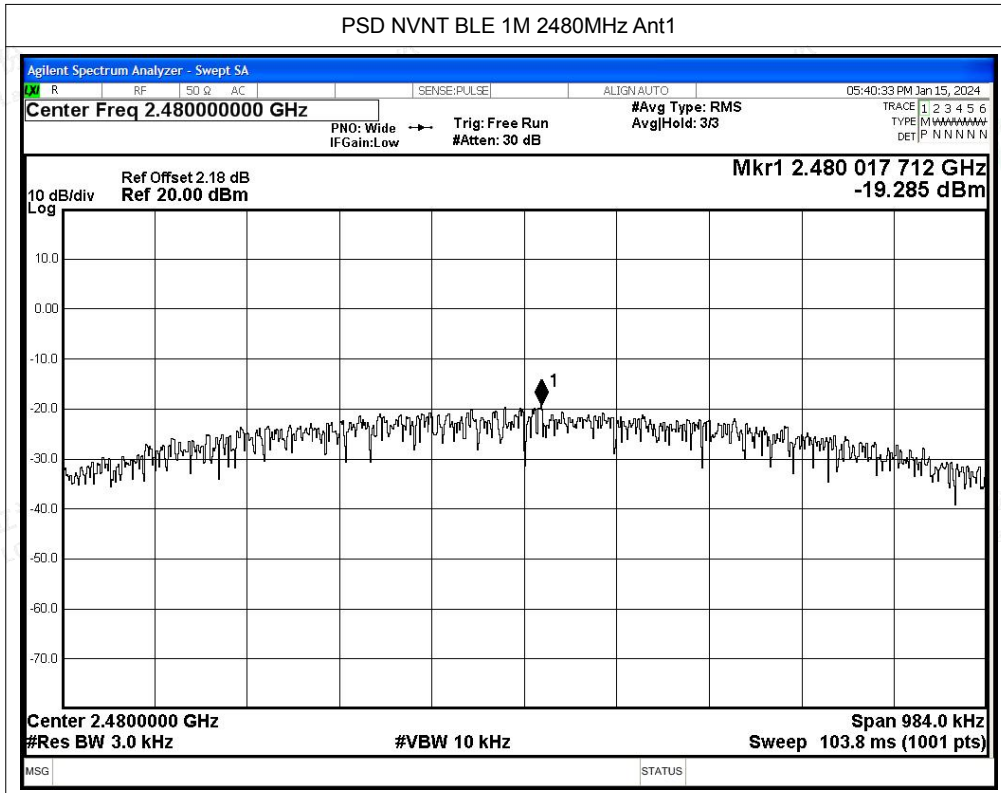


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## A.4 Band Edge

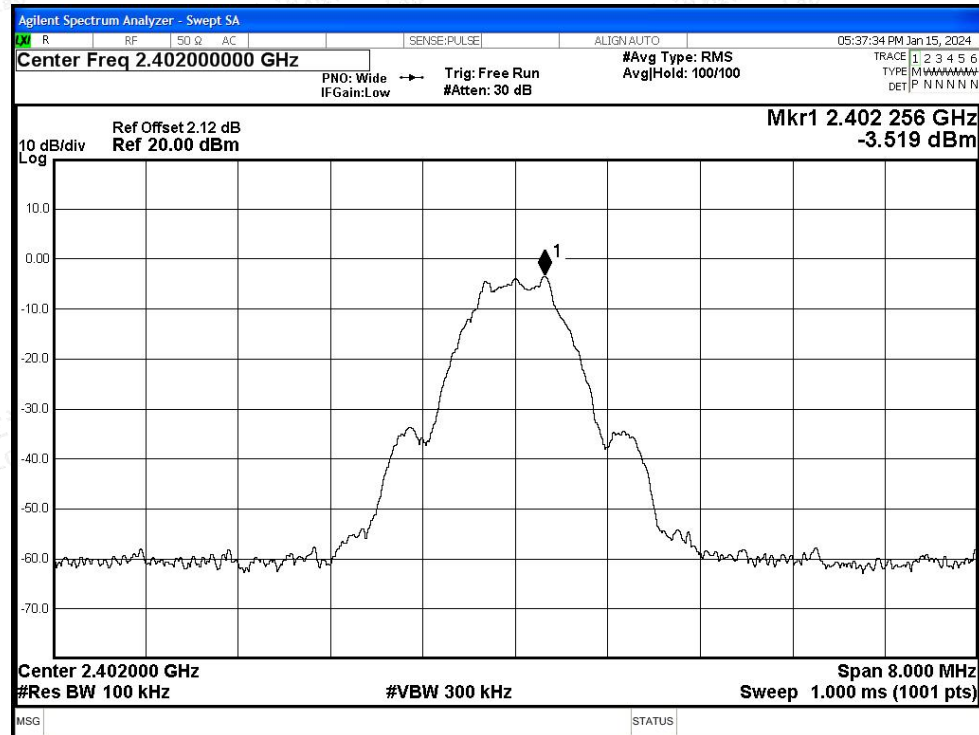
| Condition | Mode   | Frequency (MHz) | Antenna | Max Value (dBc) | Limit (dBc) | Verdict |
|-----------|--------|-----------------|---------|-----------------|-------------|---------|
| NVNT      | BLE 1M | 2402            | Ant1    | -53.35          | -20         | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | -53.25          | -20         | Pass    |



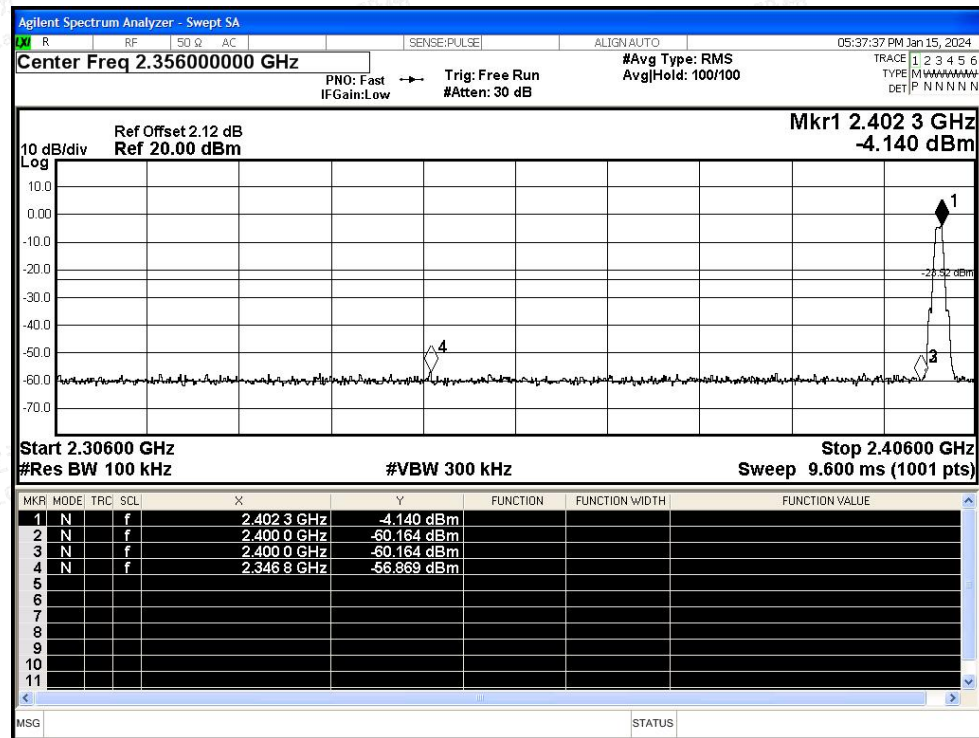


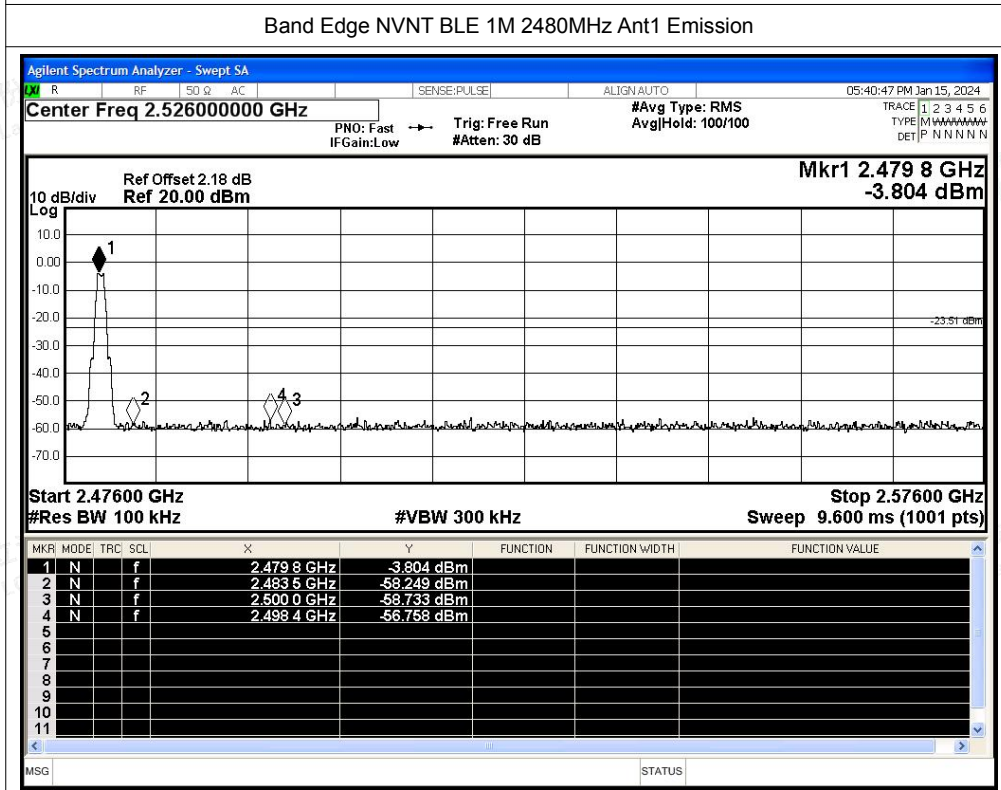
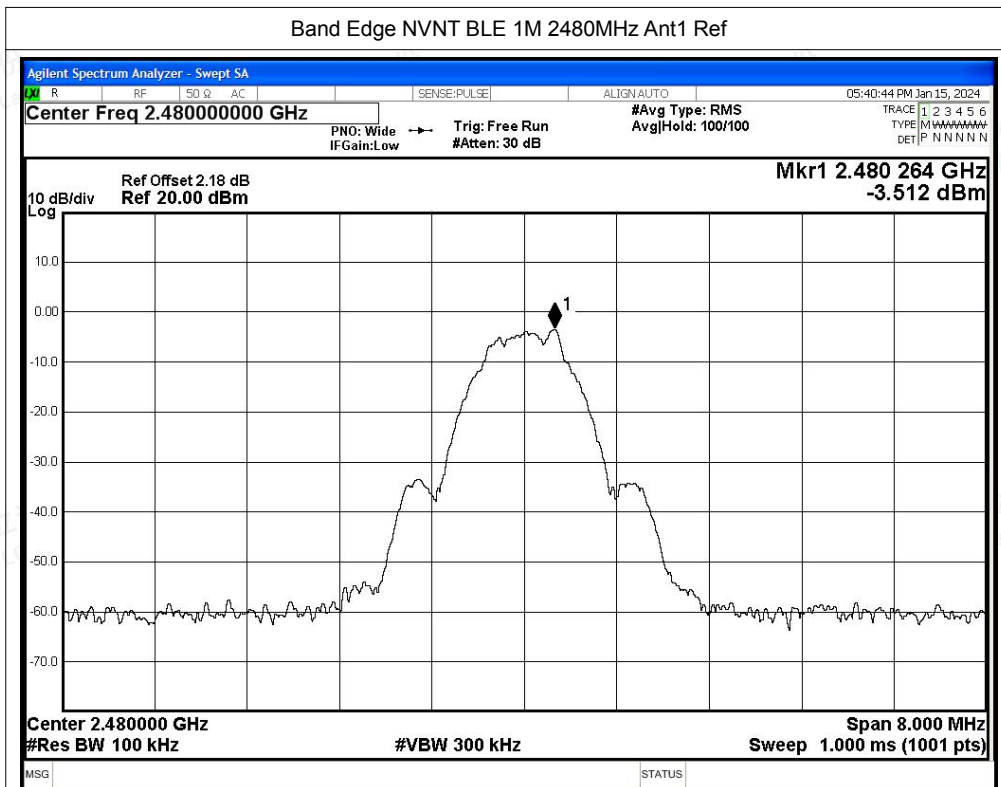
Test Graphs

Band Edge NVNT BLE 1M 2402MHz Ant1 Ref



Band Edge NVNT BLE 1M 2402MHz Ant1 Emission







### A.5 Conducted RF Spurious Emission

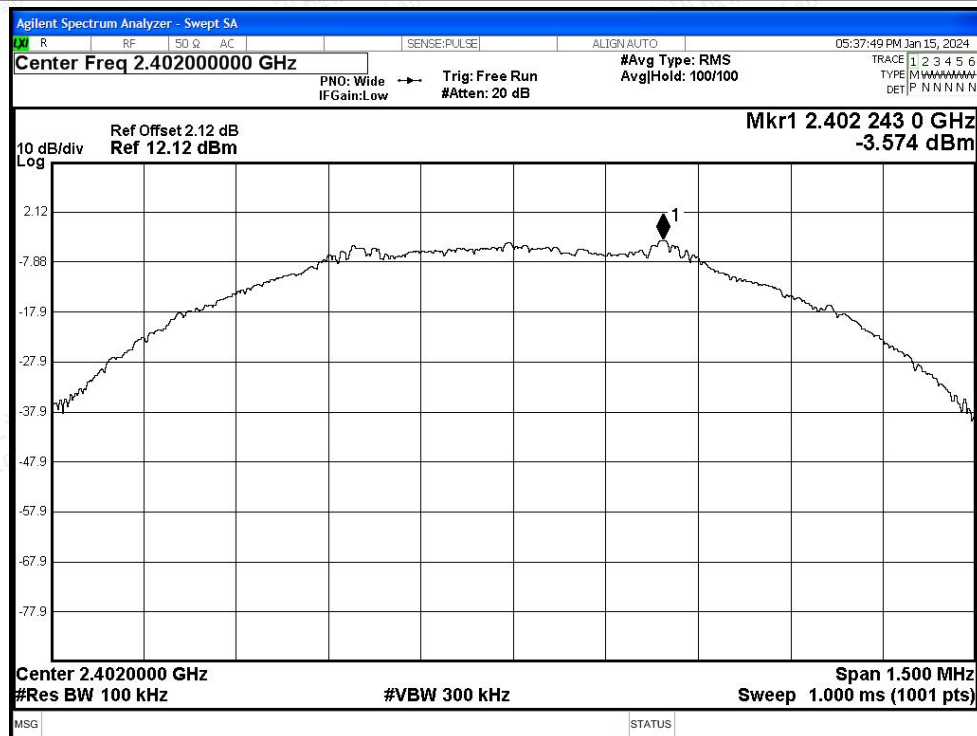
| Condition | Mode   | Frequency (MHz) | Antenna | Max Value (dBc) | Limit (dBc) | Verdict |
|-----------|--------|-----------------|---------|-----------------|-------------|---------|
| NVNT      | BLE 1M | 2402            | Ant1    | -51.18          | -20         | Pass    |
| NVNT      | BLE 1M | 2440            | Ant1    | -51.79          | -20         | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | -51.02          | -20         | Pass    |



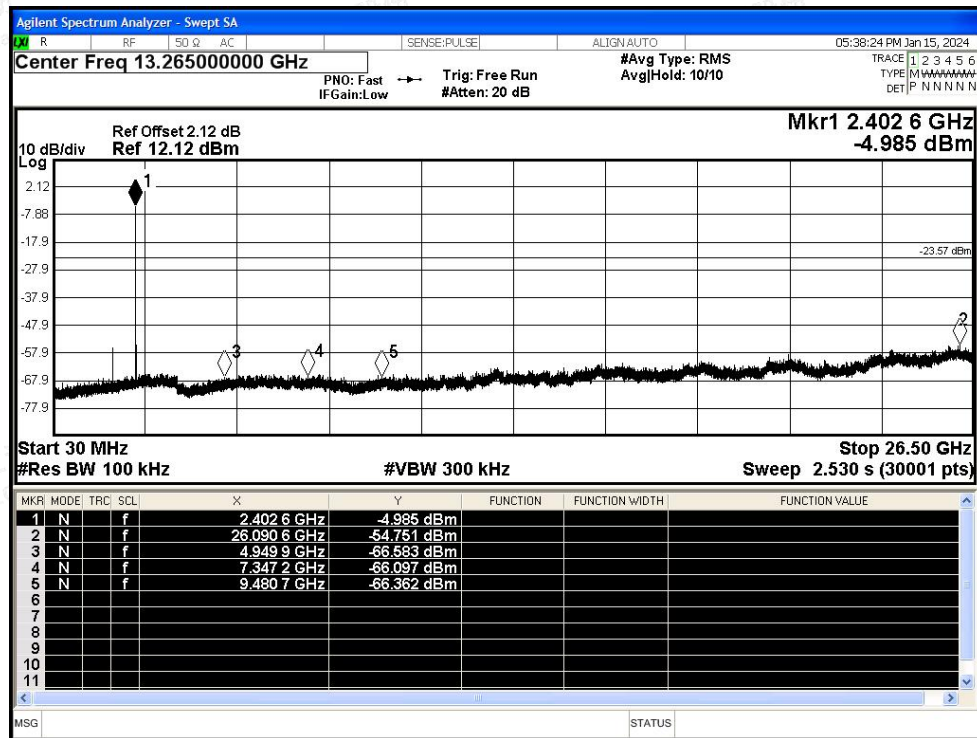


Test Graphs

Tx. Spurious NVNT BLE 1M 2402MHz Ant1 Ref



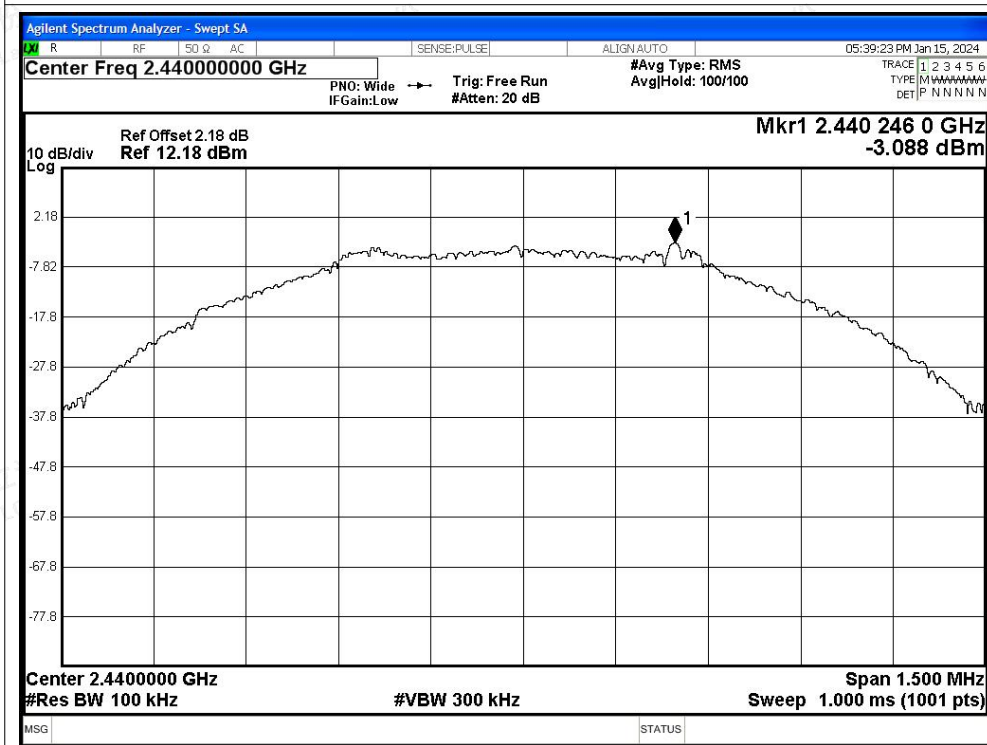
Tx. Spurious NVNT BLE 1M 2402MHz Ant1 Emission



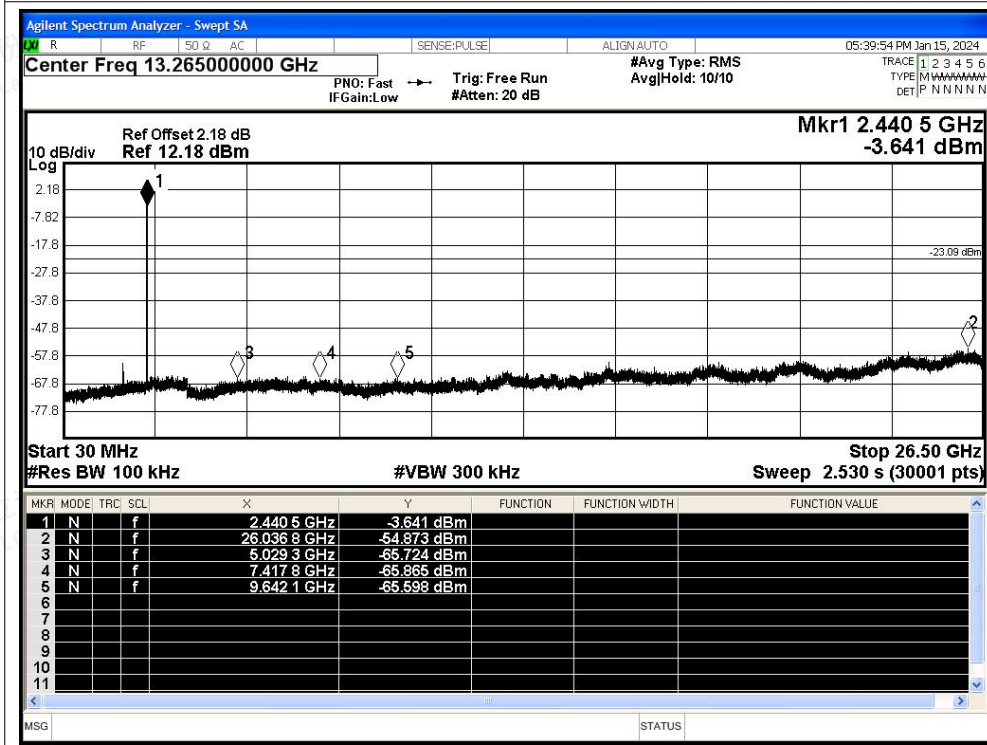




Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Ref



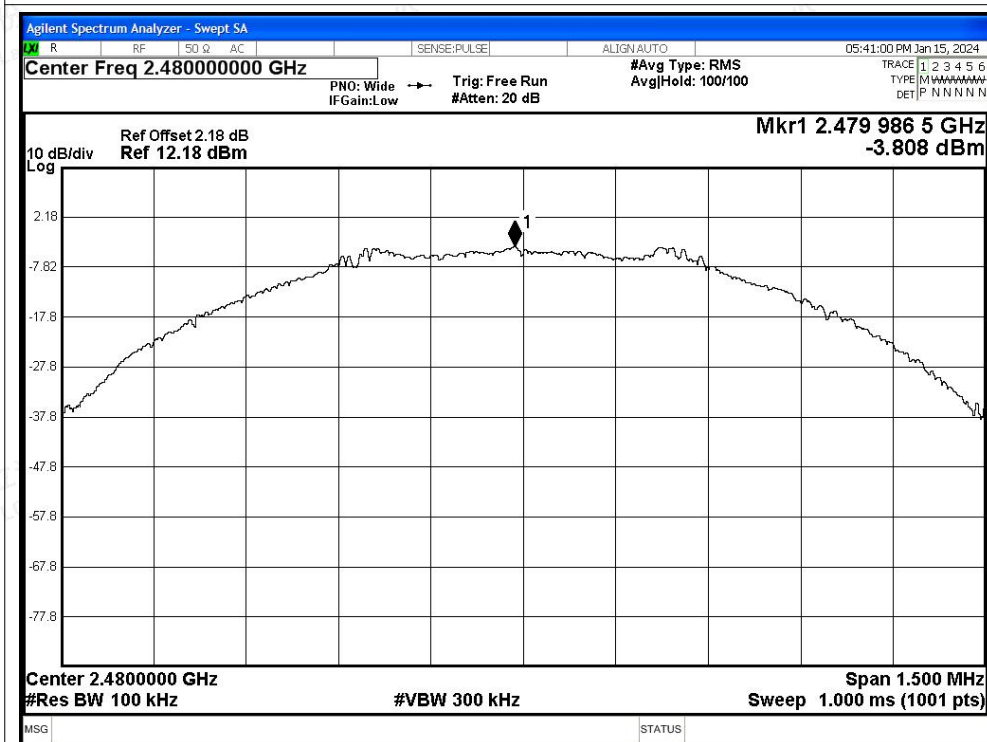
Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Emission



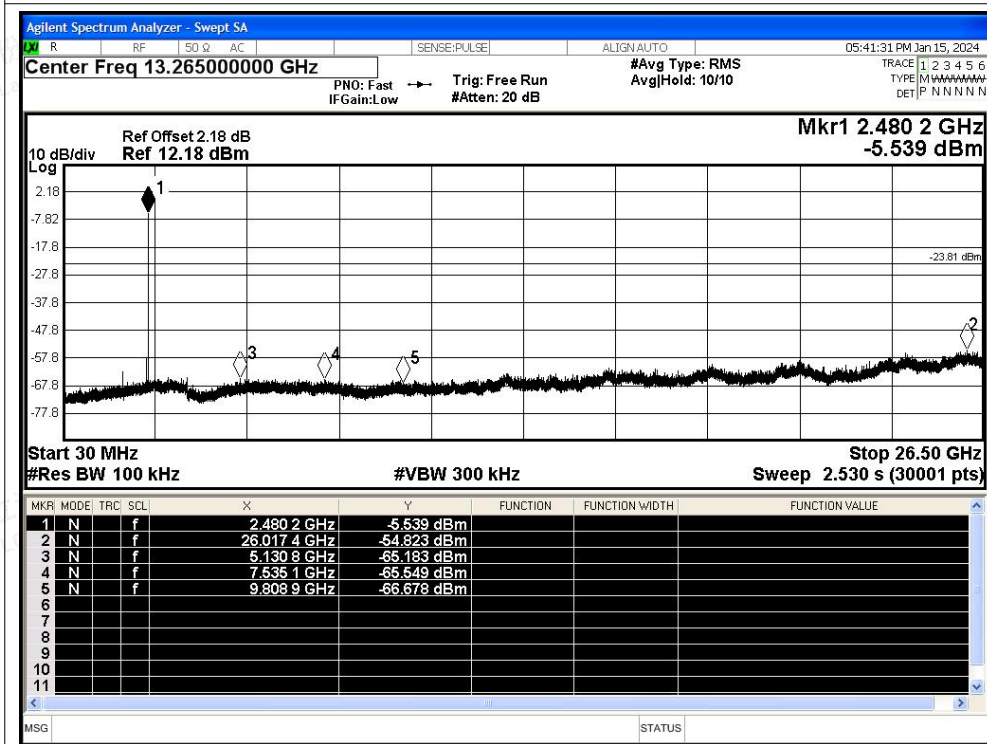




Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Ref



Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Emission





## A.6 Duty Cycle

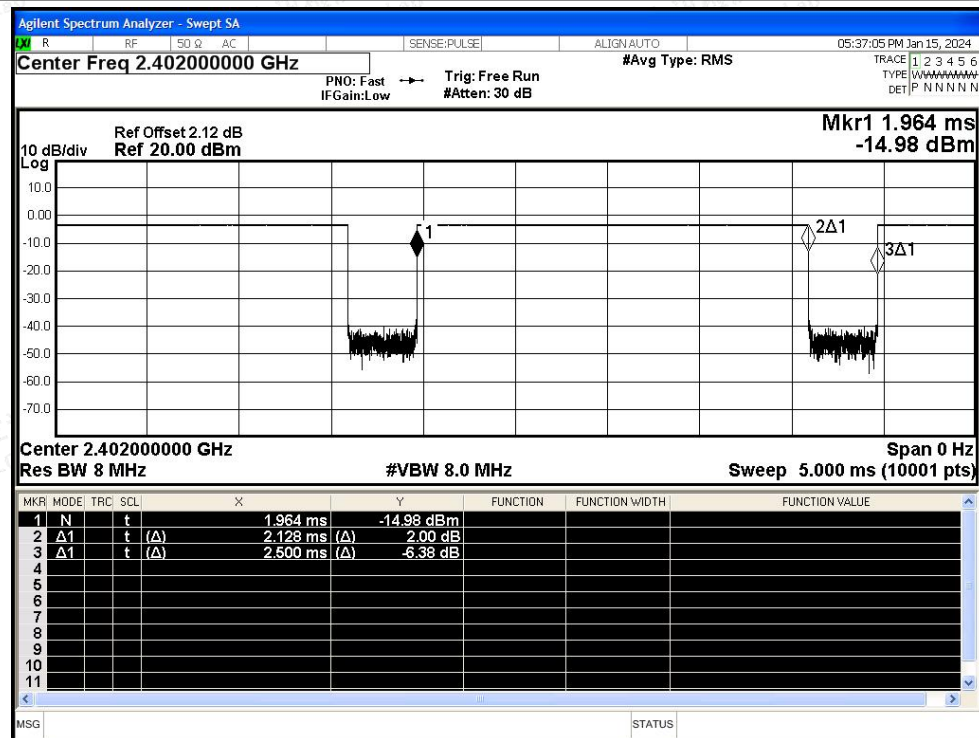
| Condition | Mode   | Frequency (MHz) | Antenna | Duty Cycle (%) | Correction Factor (dB) | 1/T (kHz) |
|-----------|--------|-----------------|---------|----------------|------------------------|-----------|
| NVNT      | BLE 1M | 2402            | Ant1    | 85.1           | 0.7                    | 0.47      |
| NVNT      | BLE 1M | 2440            | Ant1    | 85.1           | 0.7                    | 0.47      |
| NVNT      | BLE 1M | 2480            | Ant1    | 85.1           | 0.7                    | 0.47      |



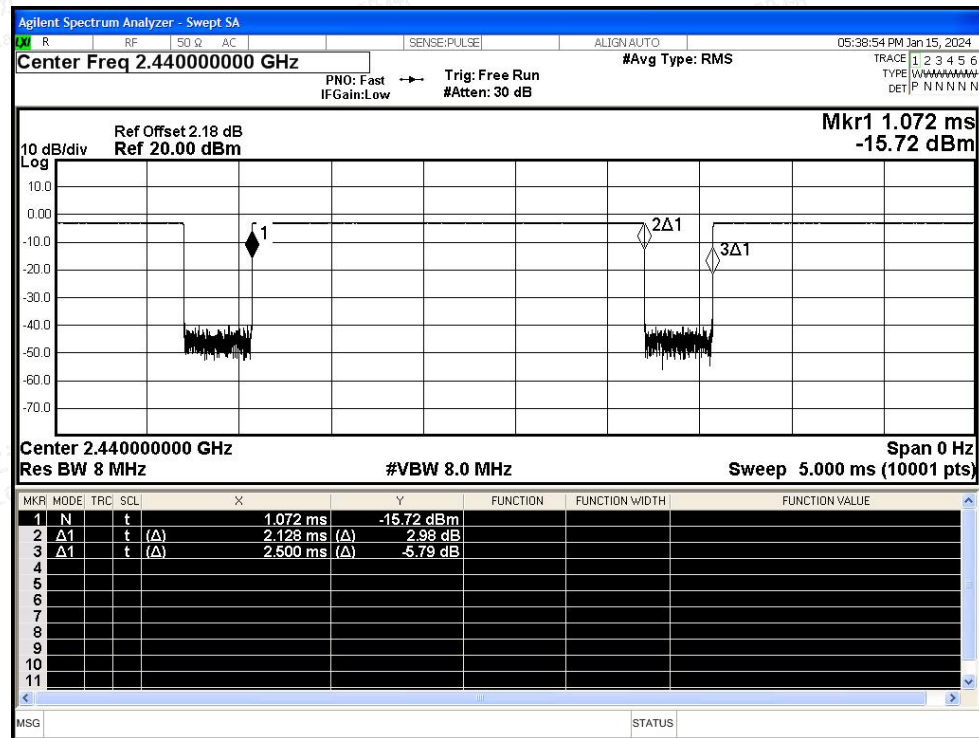


## Test Graphs

## Duty Cycle NVNT BLE 1M 2402MHz Ant1



## Duty Cycle NVNT BLE 1M 2440MHz Ant1

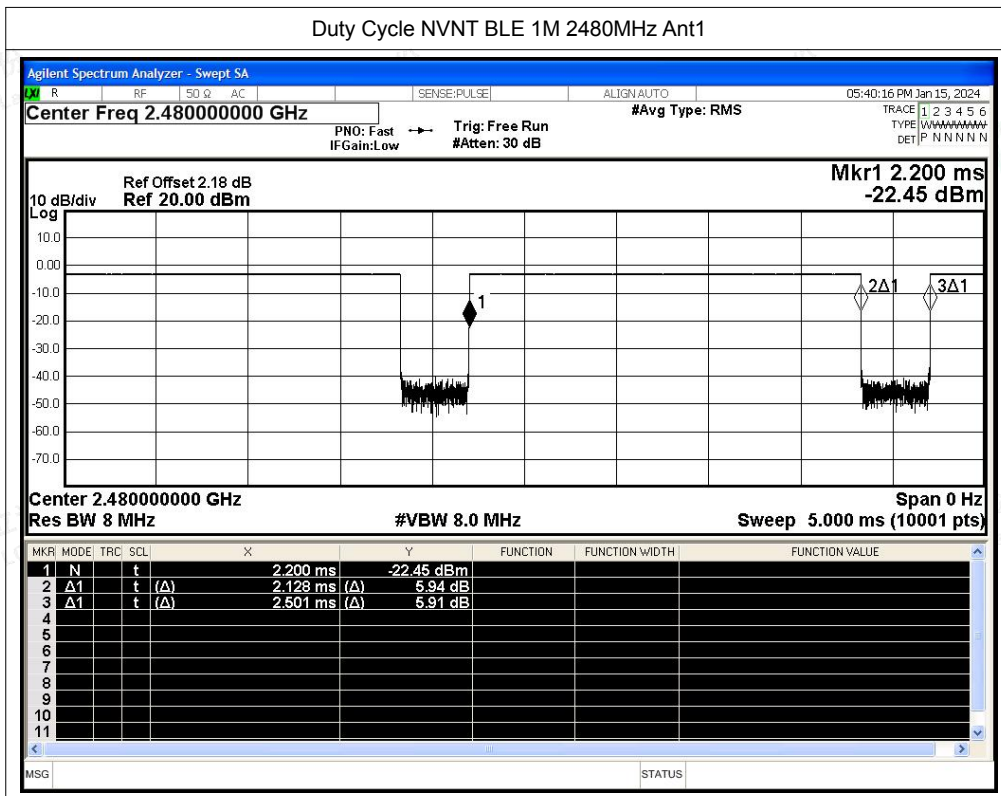


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## A.7 Restrict Band

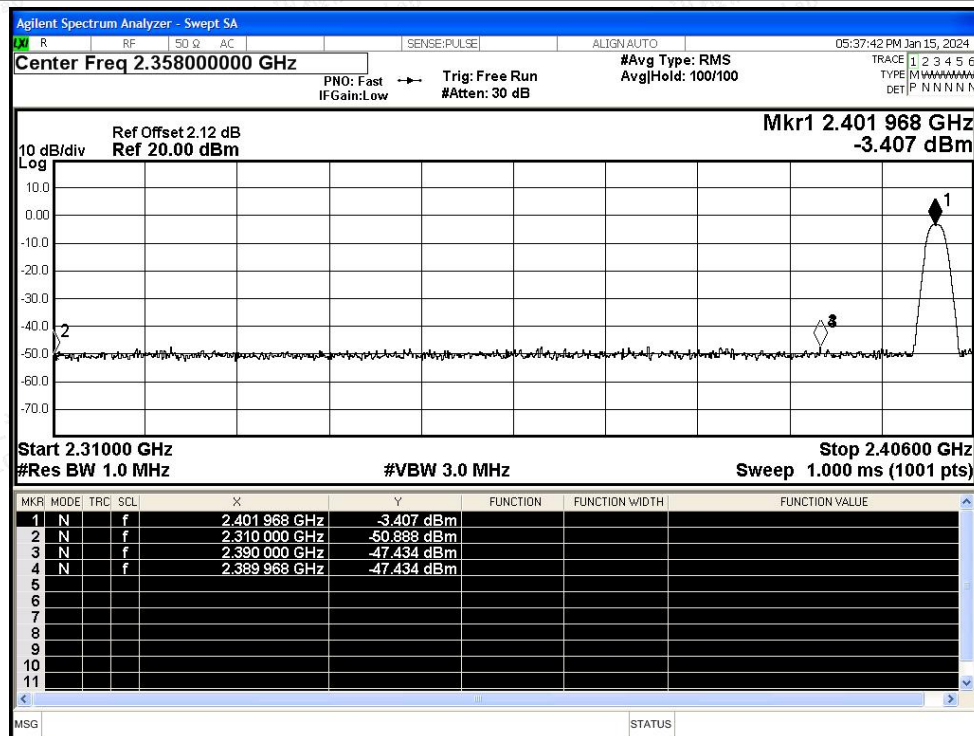
| Condition | Mode   | Frequency<br>(MHz) | Antenna | Spur<br>Freq<br>(MHz) | Power<br>(dBm) | Gain<br>(dBi) | Duty<br>Factor<br>(dB) | E<br>(dBuV/m) | Detector | Limit<br>(dBuV/m) | Verdict |
|-----------|--------|--------------------|---------|-----------------------|----------------|---------------|------------------------|---------------|----------|-------------------|---------|
| NVNT      | BLE 1M | 2402               | Ant1    | 2310                  | -50.89         | 2             | -                      | 46.37         | Peak     | 74                | Pass    |
| NVNT      | BLE 1M | 2402               | Ant1    | 2310                  | -58.61         | 2             | 0.7                    | 39.35         | Average  | 54                | Pass    |
| NVNT      | BLE 1M | 2402               | Ant1    | 2389.968              | -47.43         | 2             | -                      | 49.83         | Peak     | 74                | Pass    |
| NVNT      | BLE 1M | 2402               | Ant1    | 2389.104              | -57.58         | 2             | 0.7                    | 40.38         | Average  | 54                | Pass    |
| NVNT      | BLE 1M | 2402               | Ant1    | 2390                  | -47.43         | 2             | -                      | 49.83         | Peak     | 74                | Pass    |
| NVNT      | BLE 1M | 2402               | Ant1    | 2390                  | -58.43         | 2             | 0.7                    | 39.53         | Average  | 54                | Pass    |
| NVNT      | BLE 1M | 2480               | Ant1    | 2483.5                | -49.11         | 2             | -                      | 48.15         | Peak     | 74                | Pass    |
| NVNT      | BLE 1M | 2480               | Ant1    | 2483.5                | -57.96         | 2             | 0.7                    | 40            | Average  | 54                | Pass    |
| NVNT      | BLE 1M | 2480               | Ant1    | 2499.16               | -46.76         | 2             | -                      | 50.5          | Peak     | 74                | Pass    |
| NVNT      | BLE 1M | 2480               | Ant1    | 2493.688              | -57.22         | 2             | 0.7                    | 40.74         | Average  | 54                | Pass    |
| NVNT      | BLE 1M | 2480               | Ant1    | 2500                  | -50.17         | 2             | -                      | 47.09         | Peak     | 74                | Pass    |
| NVNT      | BLE 1M | 2480               | Ant1    | 2500                  | -58.03         | 2             | 0.7                    | 39.93         | Average  | 54                | Pass    |



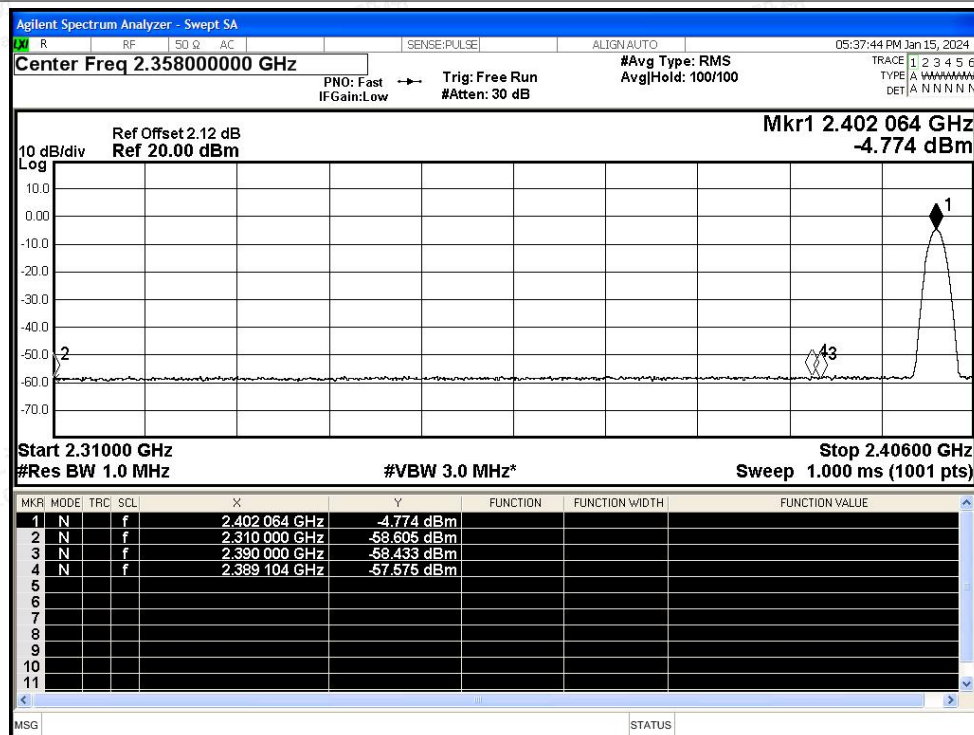


Test Graphs

Restrict Band NVNT BLE 1M 2402MHz Ant1 Peak



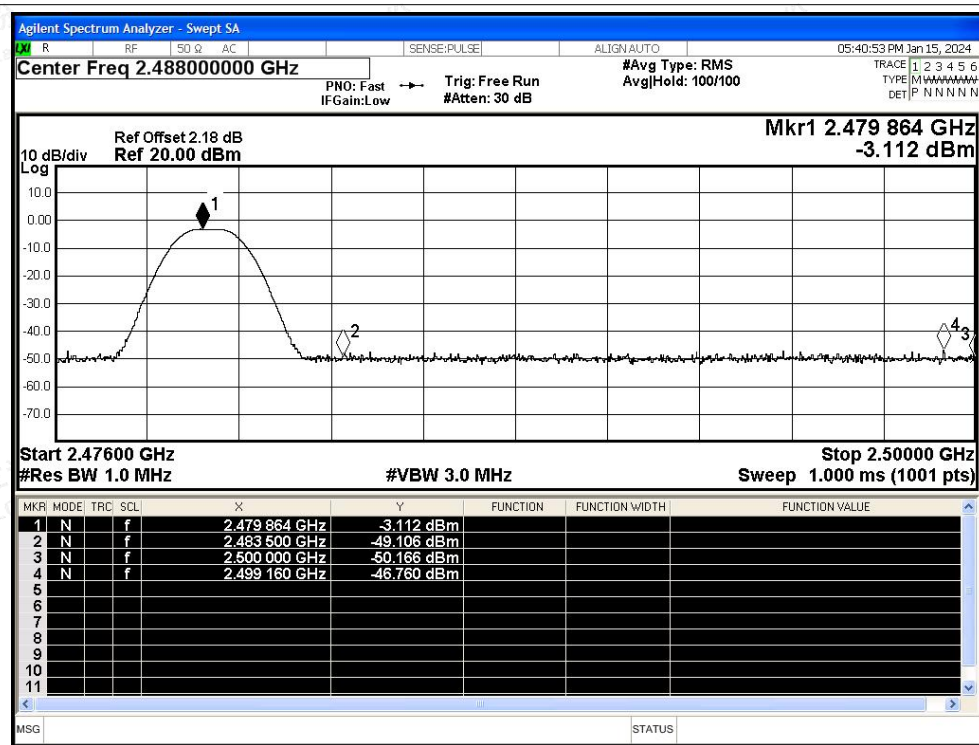
Restrict Band NVNT BLE 1M 2402MHz Ant1 Average



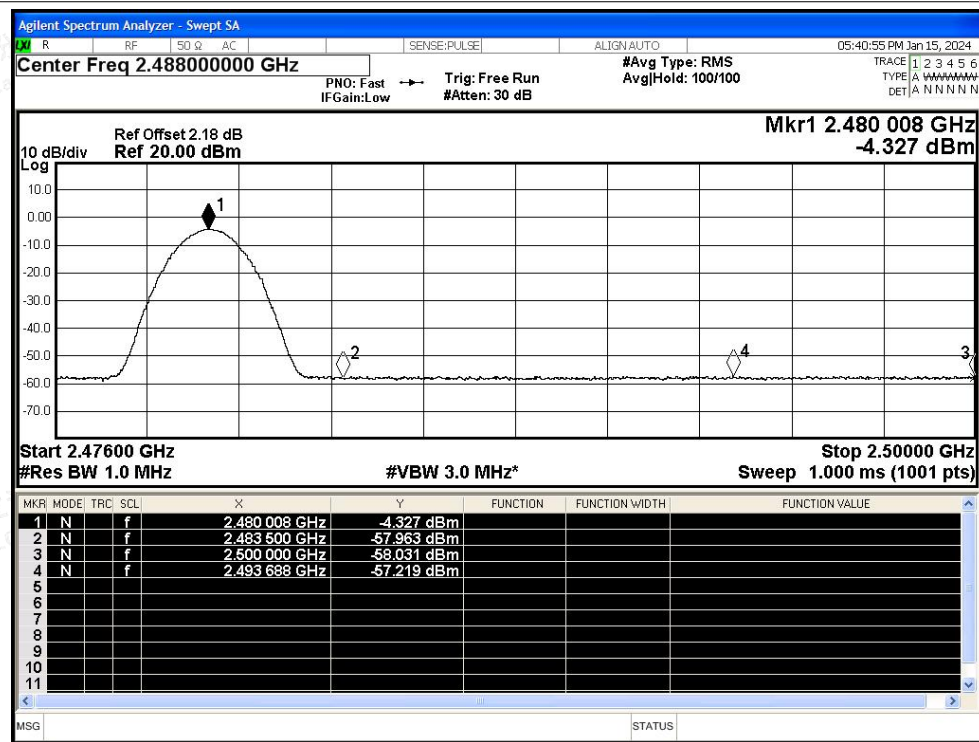




## Restrict Band NVNT BLE 1M 2480MHz Ant1 Peak



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



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