



## Appendix A

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

Product Name: Beacon

Test Model: W8U

#### Environmental Conditions

|                    |           |
|--------------------|-----------|
| Temperature:       | 23.8 ° C  |
| Relative Humidity: | 52.1%     |
| ATM Pressure:      | 100.0 kPa |
| Test Engineer:     | Taylor Hu |
| Supervised by:     | Ling Zhu  |



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## A.1 -6dB Bandwidth

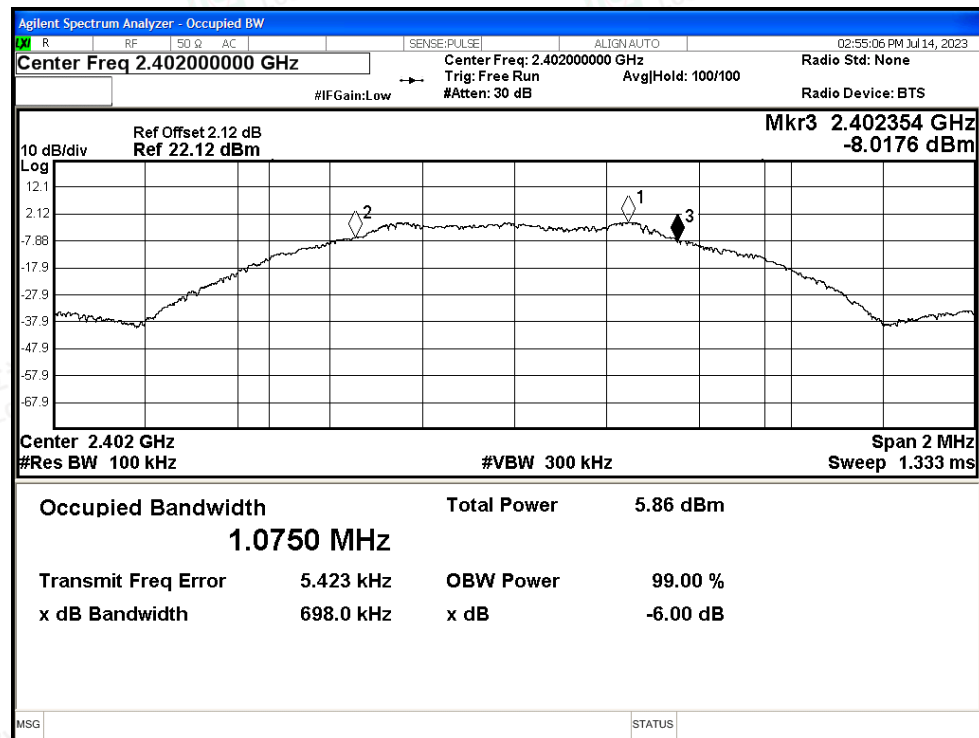
| Condition | Mode   | Frequency (MHz) | Antenna | -6 dB Bandwidth (MHz) | Limit -6 dB Bandwidth (MHz) | Verdict |
|-----------|--------|-----------------|---------|-----------------------|-----------------------------|---------|
| NVNT      | BLE 1M | 2402            | Ant1    | 0.698                 | $\geq 0.5$                  | Pass    |
| NVNT      | BLE 1M | 2440            | Ant1    | 0.709                 | $\geq 0.5$                  | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 0.704                 | $\geq 0.5$                  | Pass    |



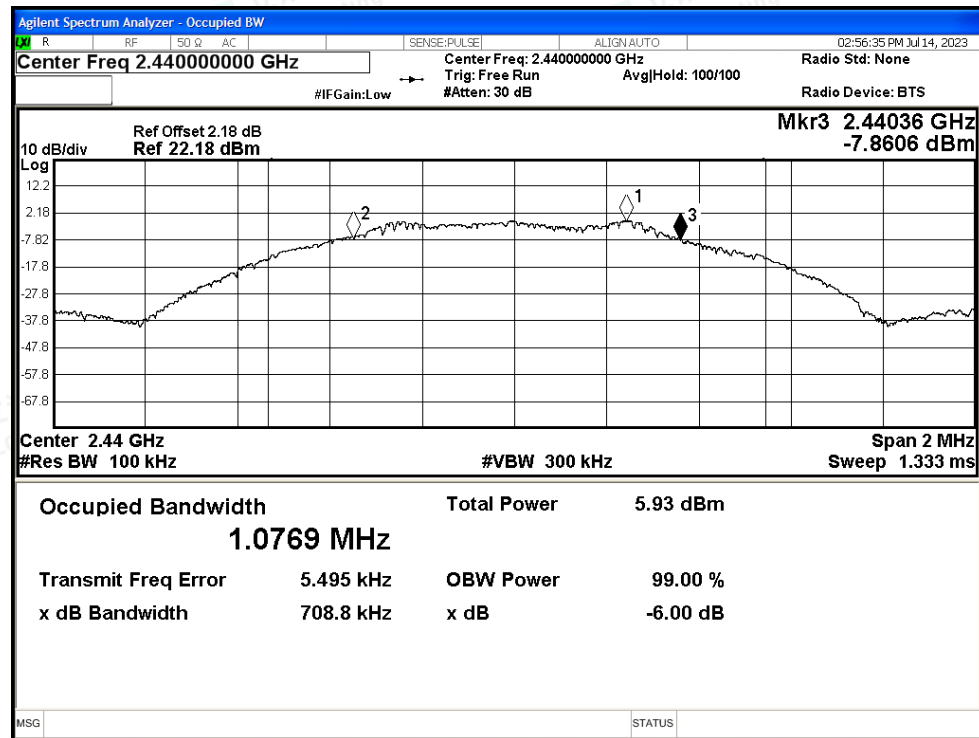


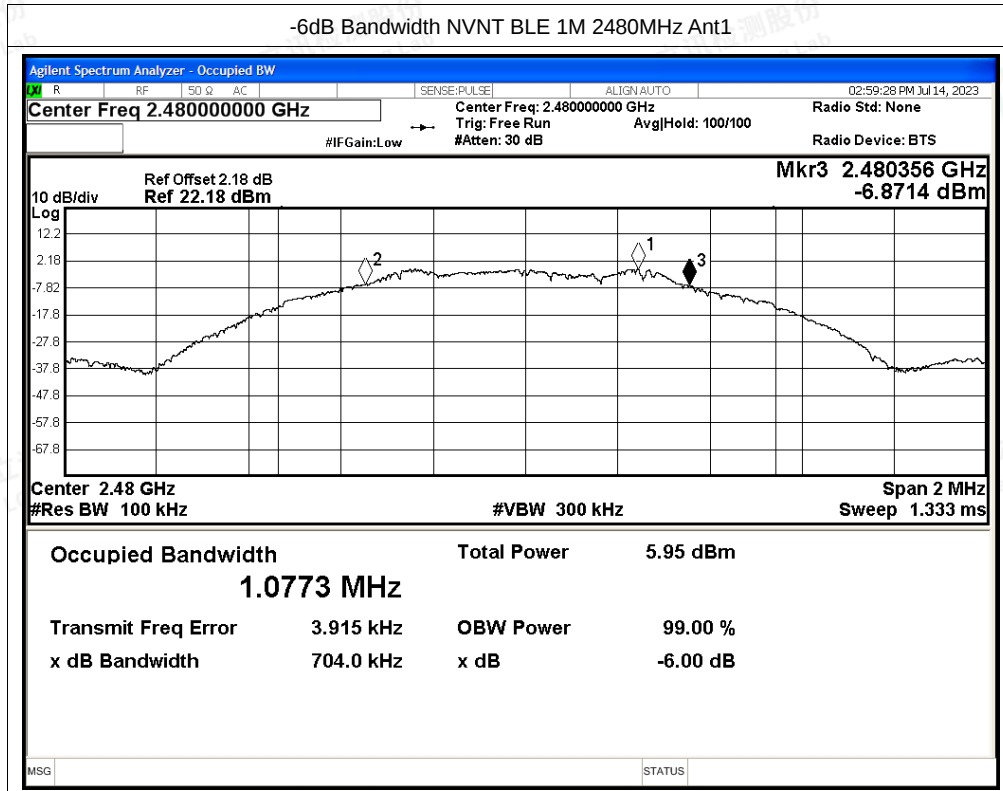
## Test Graphs

-6dB Bandwidth NVNT BLE 1M 2402MHz Ant1



-6dB Bandwidth NVNT BLE 1M 2440MHz Ant1







## A.2 Maximum Conducted Output Power

| Condition | Mode   | Frequency (MHz) | Antenna | Conducted Power (dBm) | Limit (dBm) | Verdict |
|-----------|--------|-----------------|---------|-----------------------|-------------|---------|
| NVNT      | BLE 1M | 2402            | Ant1    | -2.80                 | 30          | Pass    |
| NVNT      | BLE 1M | 2440            | Ant1    | -2.64                 | 30          | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | -2.53                 | 30          | Pass    |

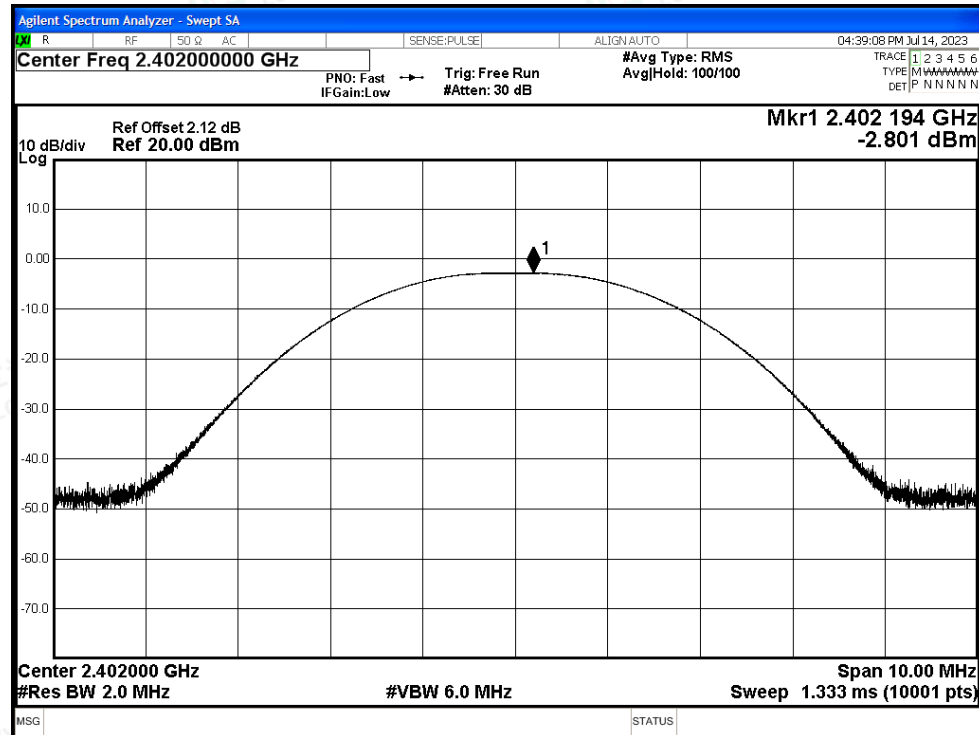


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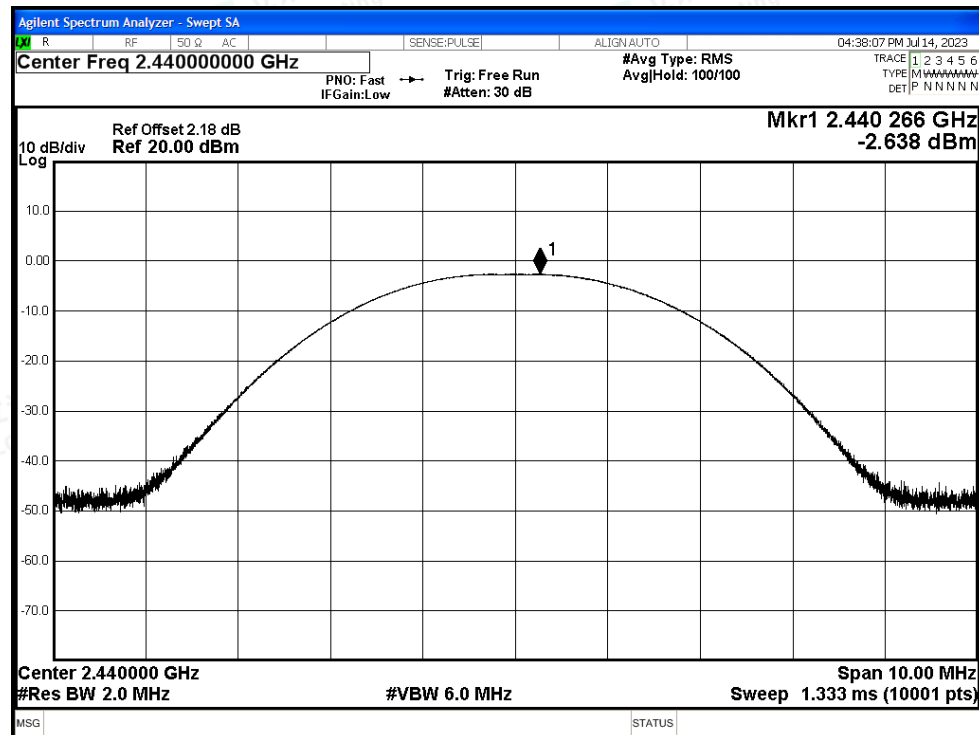


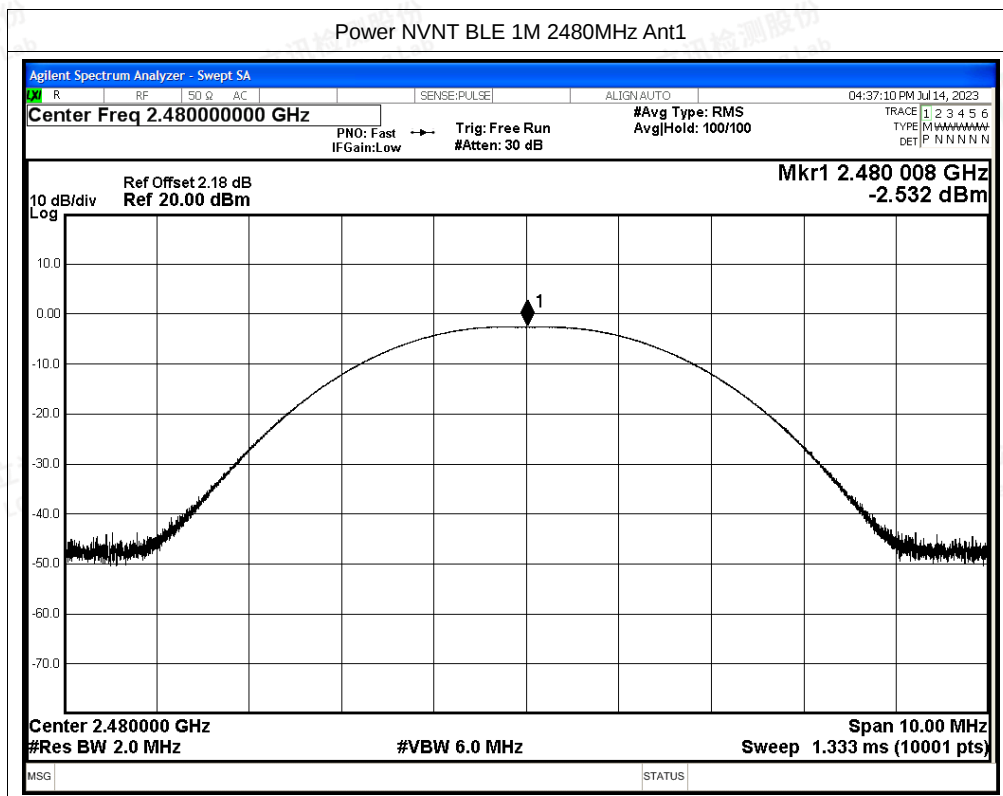
## Test Graphs

Power NVNT BLE 1M 2402MHz Ant1



Power NVNT BLE 1M 2440MHz Ant1







### 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    | -17.92                   | 8                | Pass    |
| NVNT      | BLE 1M | 2440            | Ant1    | -17.79                   | 8                | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | -17.67                   | 8                | Pass    |

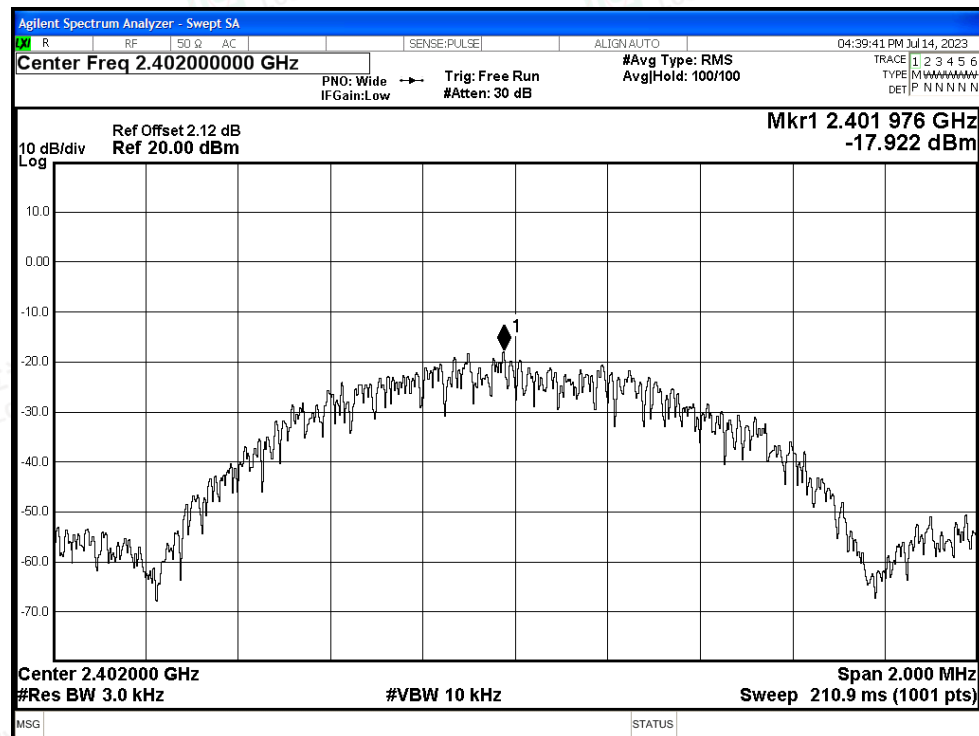


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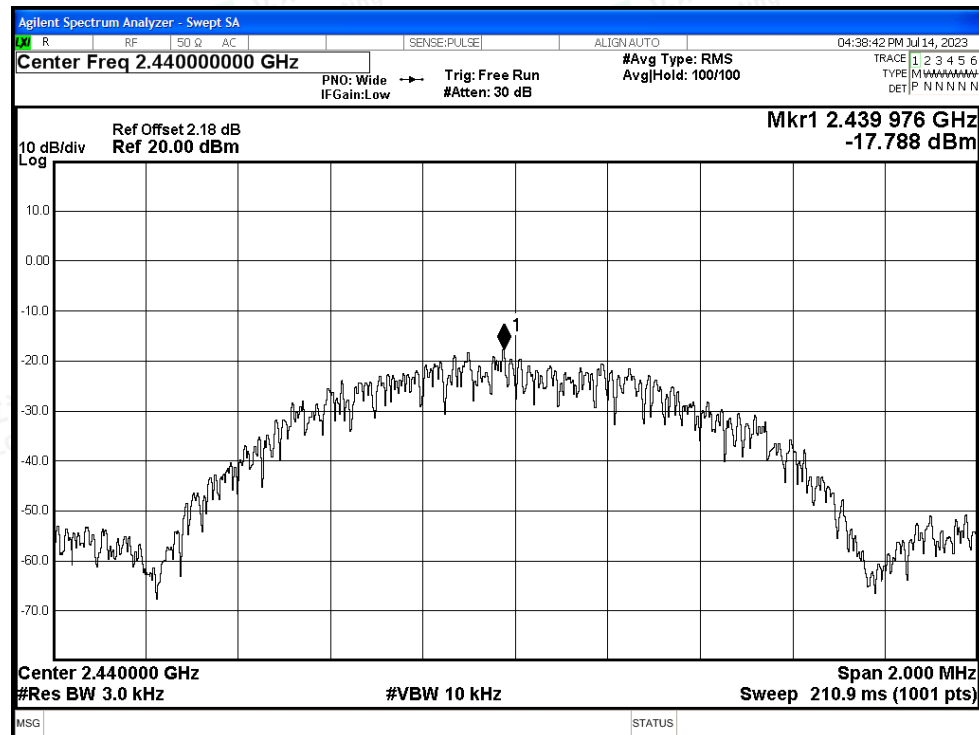


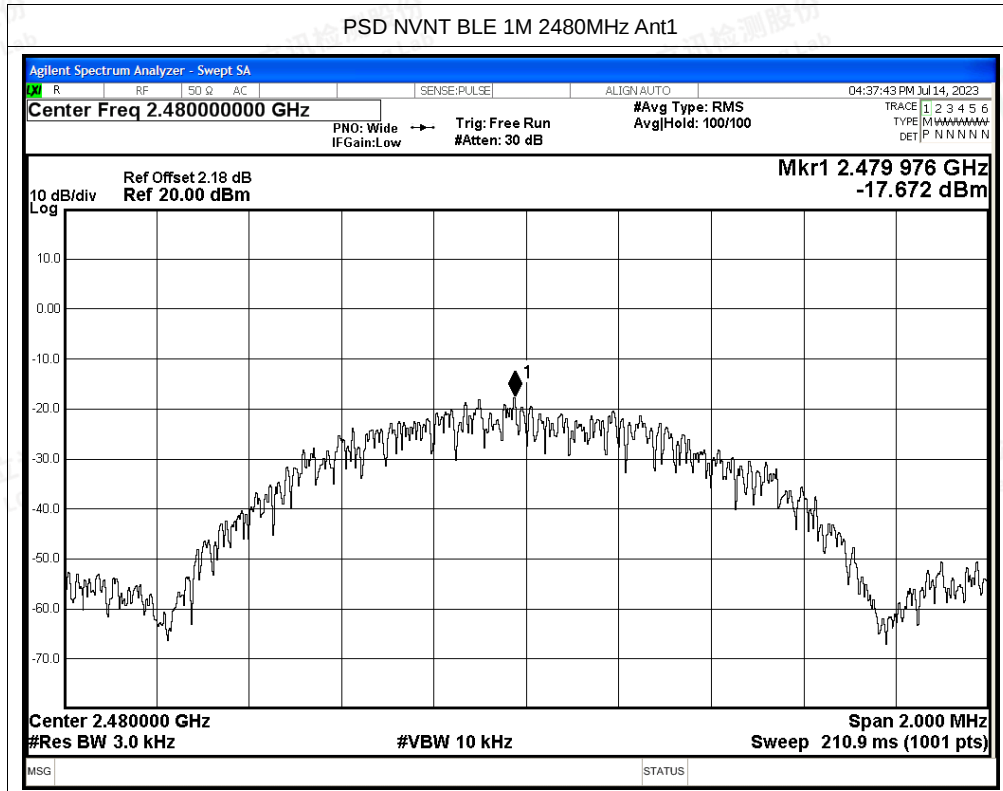
## Test Graphs

PSD NVNT BLE 1M 2402MHz Ant1



PSD NVNT BLE 1M 2440MHz Ant1







## A.4 Band Edge

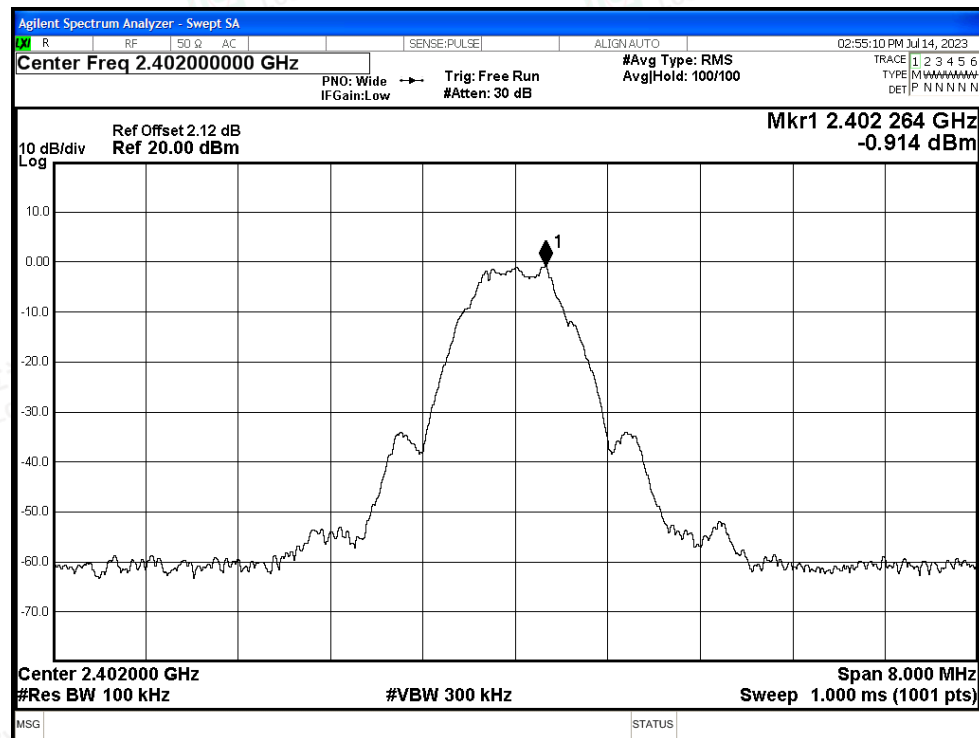
| Condition | Mode   | Frequency (MHz) | Antenna | Max Value (dBc) | Limit (dBc) | Verdict |
|-----------|--------|-----------------|---------|-----------------|-------------|---------|
| NVNT      | BLE 1M | 2402            | Ant1    | -56.58          | -20         | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | -56.04          | -20         | Pass    |



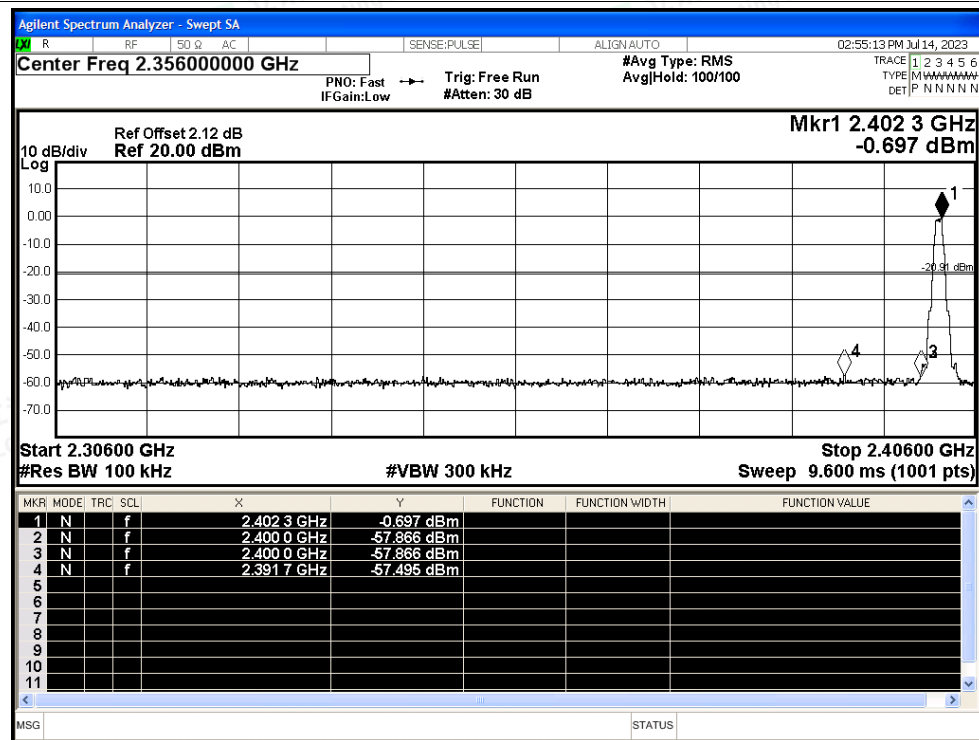


## Test Graphs

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

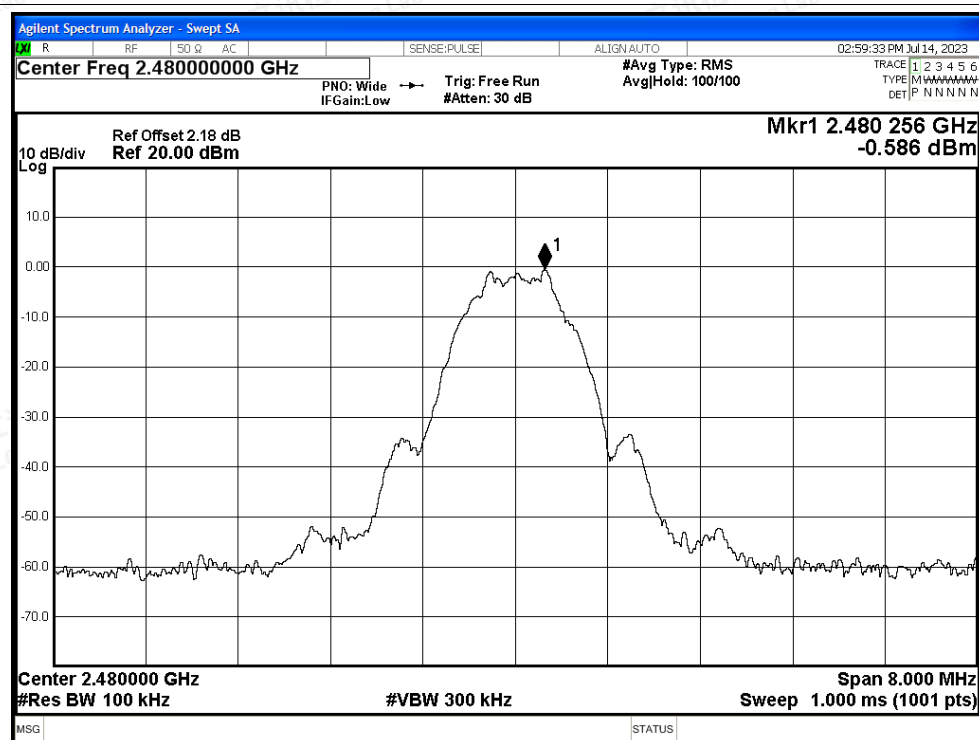


## Band Edge NVNT BLE 1M 2402MHz Ant1 Emission

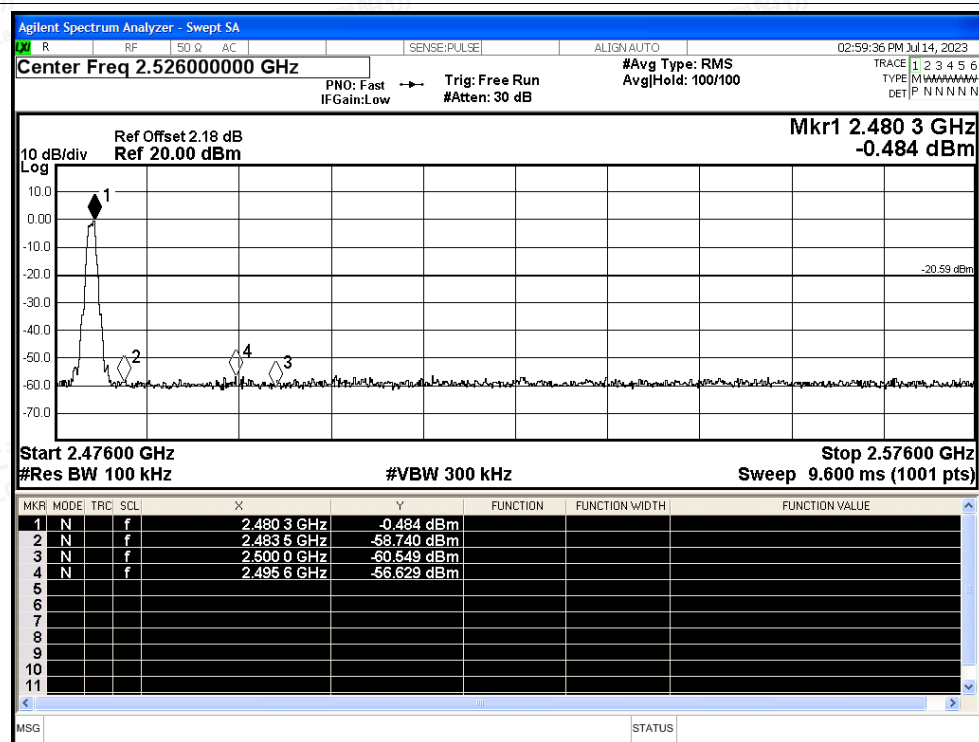




## Band Edge NVNT BLE 1M 2480MHz Ant1 Ref



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





### A.5 Conducted RF Spurious Emission

| Condition | Mode   | Frequency (MHz) | Antenna | Max Value (dBc) | Limit (dBc) | Verdict |
|-----------|--------|-----------------|---------|-----------------|-------------|---------|
| NVNT      | BLE 1M | 2402            | Ant1    | -55.12          | -20         | Pass    |
| NVNT      | BLE 1M | 2440            | Ant1    | -55.2           | -20         | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | -54.3           | -20         | Pass    |

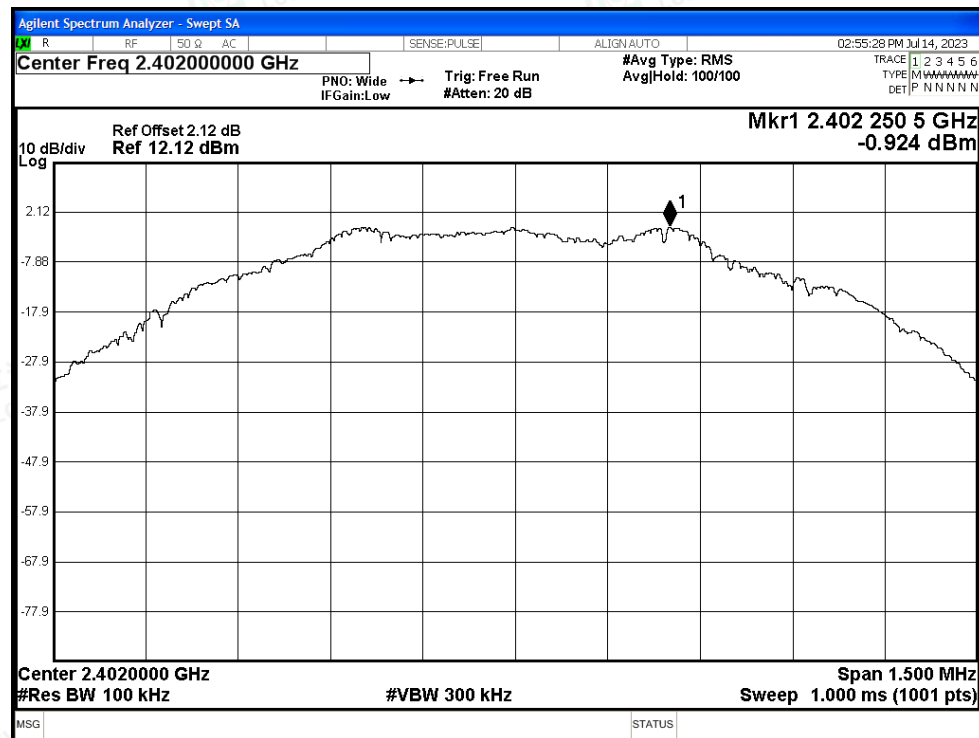


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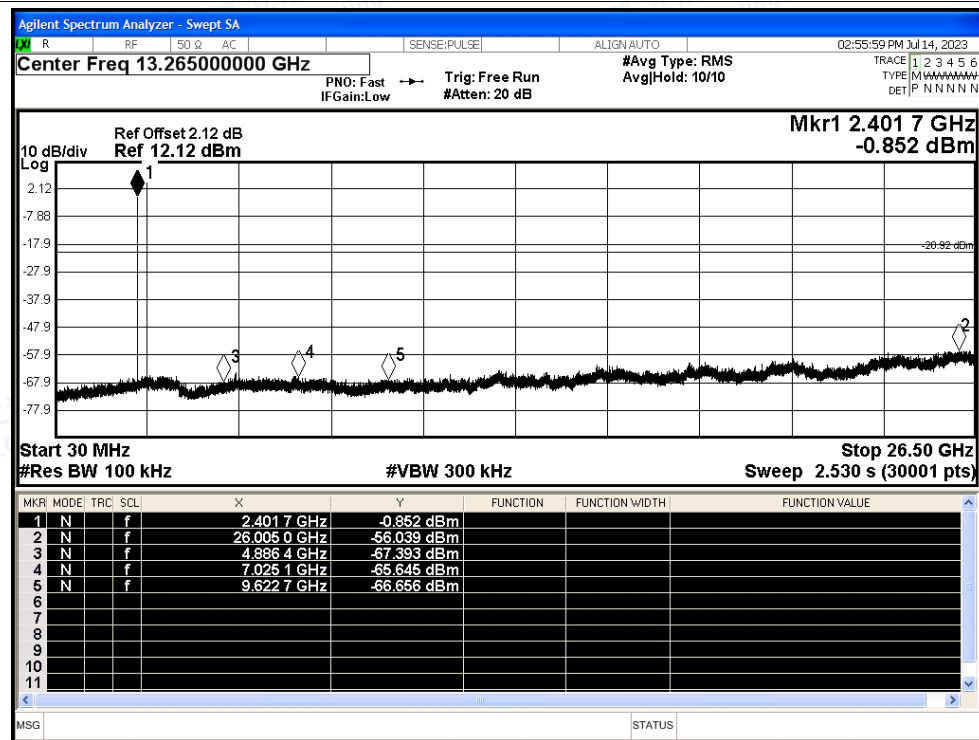


## Test Graphs

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

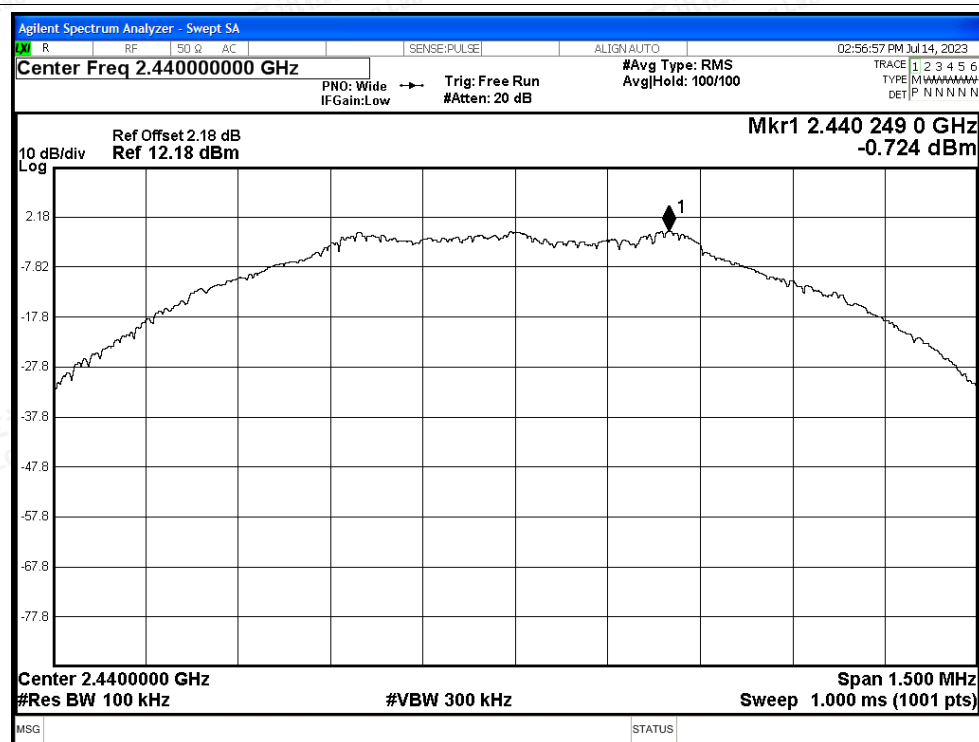


## Tx. Spurious NVNT BLE 1M 2402MHz Ant1 Emission

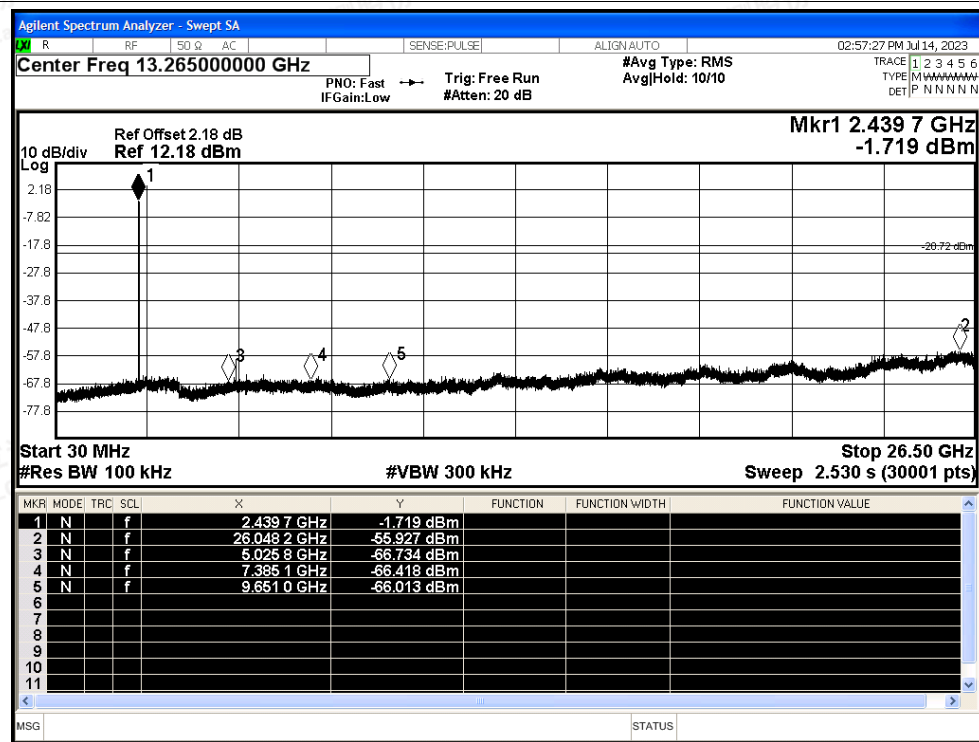




## Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Ref

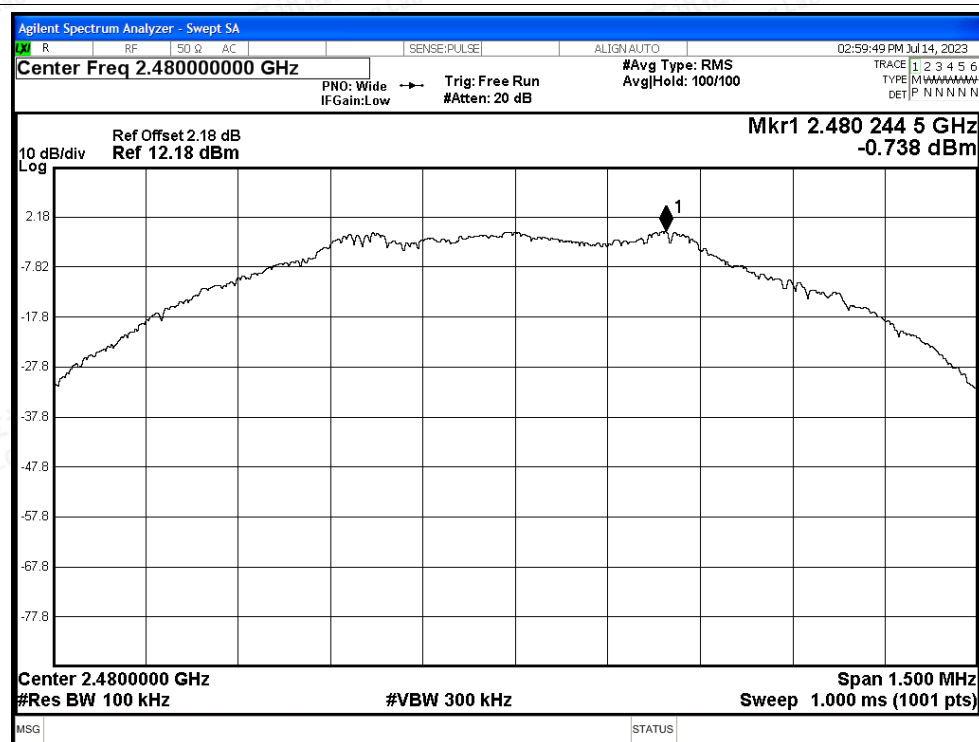


## Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Emission

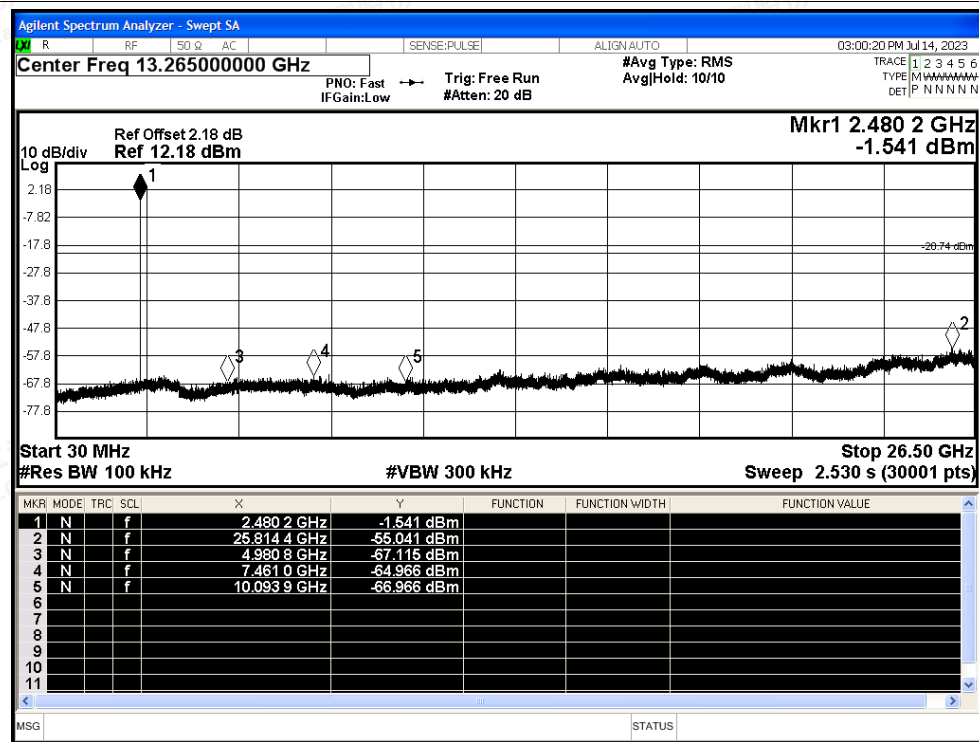




## Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Ref



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





## A.6 Duty Cycle

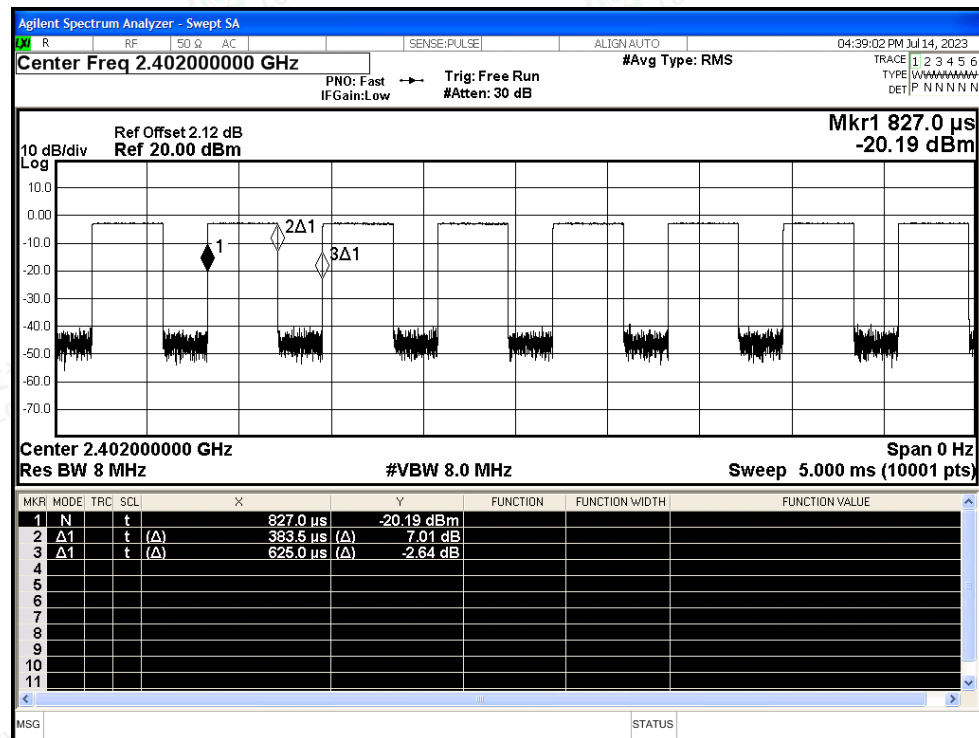
| Condition | Mode   | Frequency (MHz) | Antenna | Duty Cycle (%) | Correction Factor (dB) | 1/T (kHz) |
|-----------|--------|-----------------|---------|----------------|------------------------|-----------|
| NVNT      | BLE 1M | 2402            | Ant1    | 61.36          | 2.12                   | 2.61      |
| NVNT      | BLE 1M | 2440            | Ant1    | 61.36          | 2.12                   | 2.61      |
| NVNT      | BLE 1M | 2480            | Ant1    | 61.44          | 2.12                   | 2.6       |



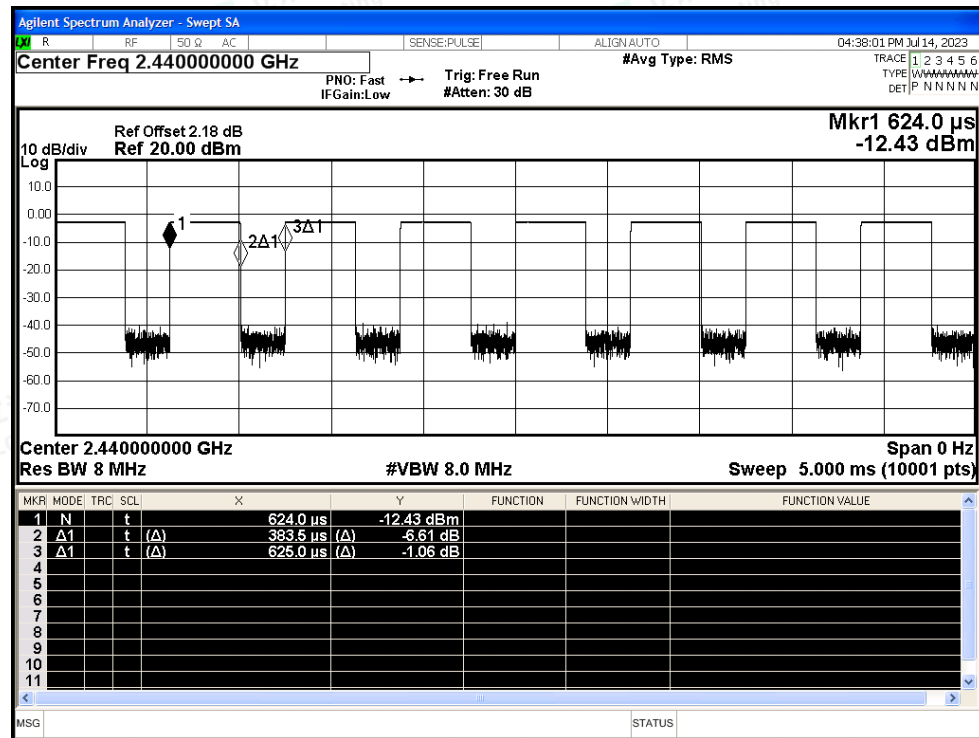


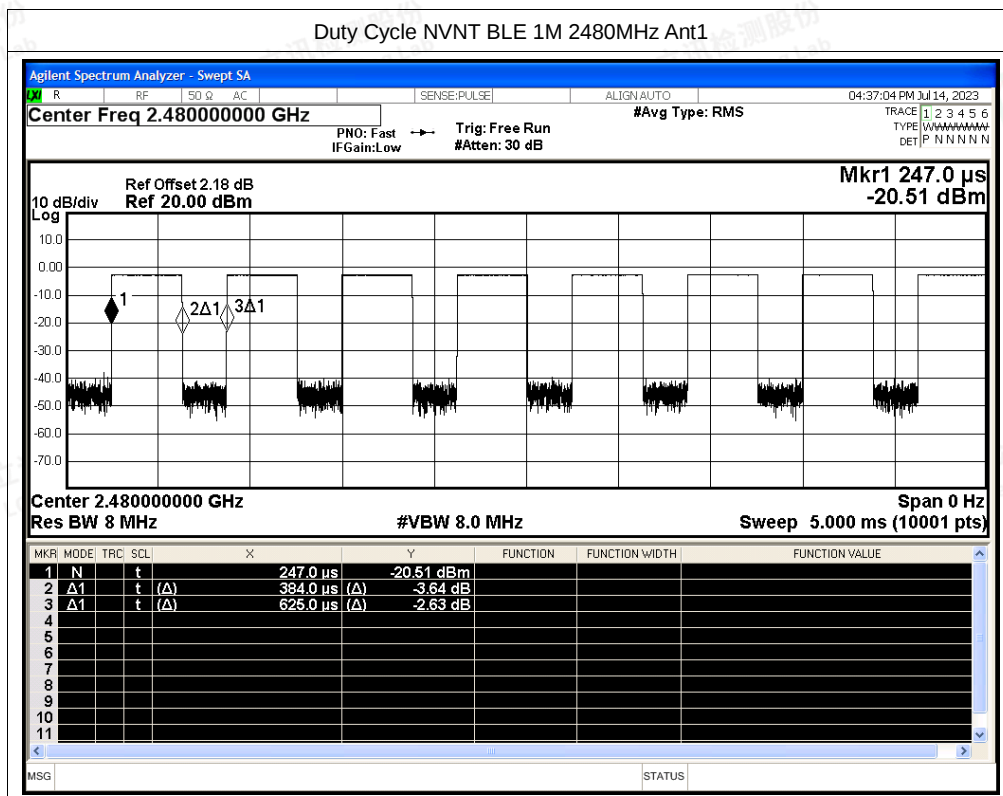
## Test Graphs

## Duty Cycle NVNT BLE 1M 2402MHz Ant1



## Duty Cycle NVNT BLE 1M 2440MHz Ant1







## A.7 Restrict Band

| Condition | Mode   | Frequency (MHz) | Antenna | Spur Freq (MHz) | Power (dBm) | Gain (dBi) | E (dBuV/m) | Detector | Limit (dBuV/m) | Verdict |
|-----------|--------|-----------------|---------|-----------------|-------------|------------|------------|----------|----------------|---------|
| NVNT      | BLE 1M | 2402            | Ant1    | 2310            | -51.06      | 2          | 46.2       | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2402            | Ant1    | 2310            | -56.97      | 2          | 40.29      | Average  | 54             | Pass    |
| NVNT      | BLE 1M | 2402            | Ant1    | 2355.12         | -47.5       | 2          | 49.76      | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2402            | Ant1    | 2355.6          | -56.41      | 2          | 40.85      | Average  | 54             | Pass    |
| NVNT      | BLE 1M | 2402            | Ant1    | 2390            | -50.69      | 2          | 46.57      | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2402            | Ant1    | 2390            | -56.83      | 2          | 40.43      | Average  | 54             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2483.5          | -49.64      | 2          | 47.62      | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2483.5          | -54.4       | 2          | 42.86      | Average  | 54             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2489.488        | -46.89      | 2          | 50.37      | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2483.512        | -54.4       | 2          | 42.86      | Average  | 54             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2500            | -49.78      | 2          | 47.48      | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2500            | -56.63      | 2          | 40.63      | Average  | 54             | Pass    |

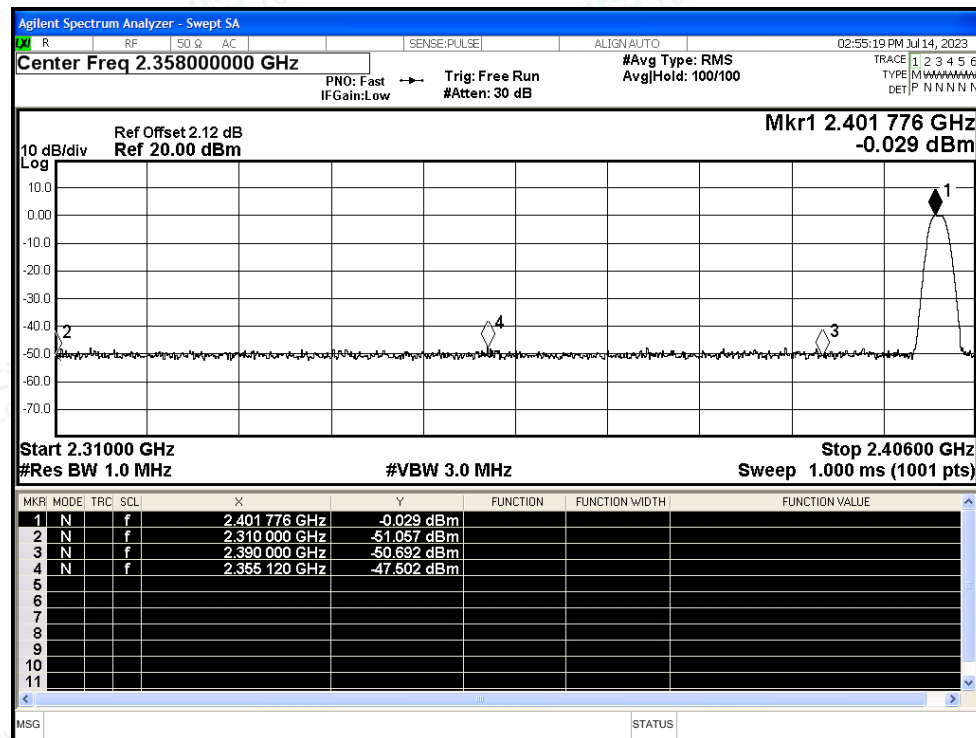


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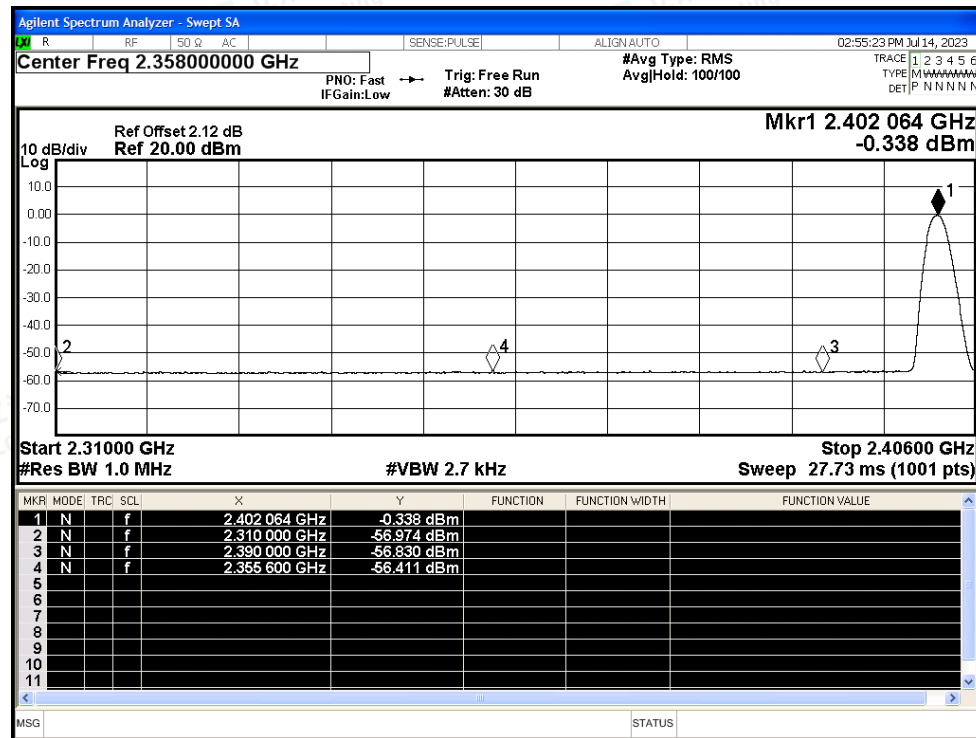


## Test Graphs

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

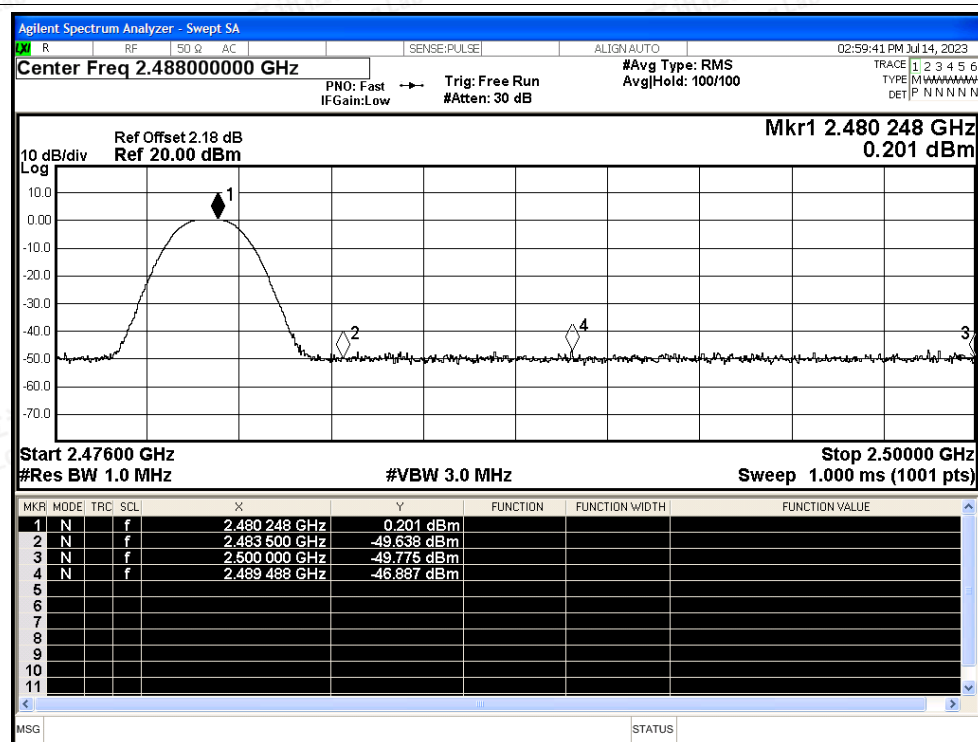


## Restrict Band NVNT BLE 1M 2402MHz Ant1 Average





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



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

