



Appendix A

RF Test Data for BLE (Conducted Measurement)

Product Name: Electric toothbrush

Test Model: W1

Environmental Conditions

|                    |           |
|--------------------|-----------|
| Temperature:       | 23.5° C   |
| Relative Humidity: | 52.2%     |
| ATM Pressure:      | 100.0 kPa |
| Test Engineer:     | Bill Zhu  |
| Supervised by:     | Li Huan   |





## A.1 6dB Bandwidth

| Condition | Mode   | Frequency (MHz) | Antenna | 6 dB Bandwidth (MHz) | Limit (MHz) | Verdict |
|-----------|--------|-----------------|---------|----------------------|-------------|---------|
| NVNT      | BLE 1M | 2402            | Ant1    | 0.701                | $\geq 0.5$  | Pass    |
| NVNT      | BLE 1M | 2440            | Ant1    | 0.711                | $\geq 0.5$  | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 0.704                | $\geq 0.5$  | Pass    |



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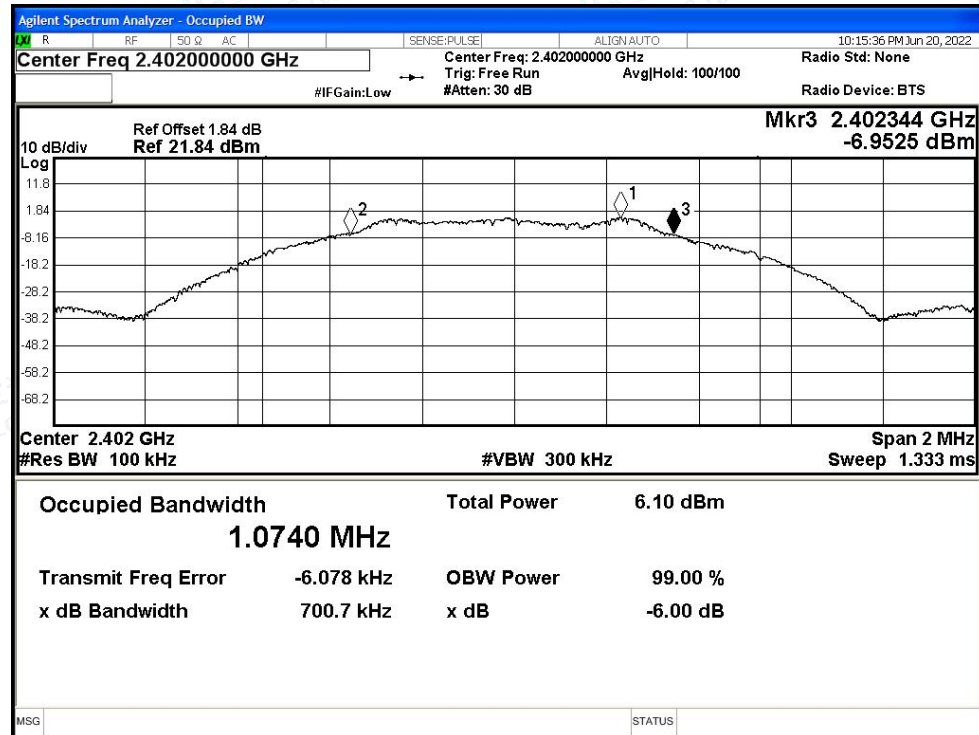
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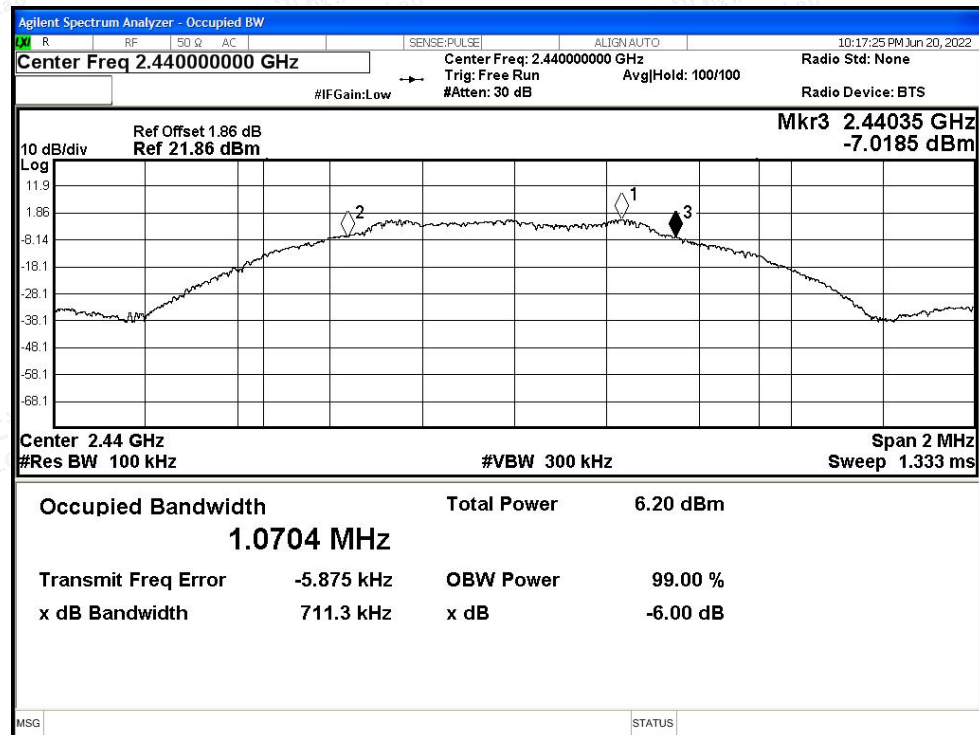


## Test Graphs

6dB Bandwidth NVNT BLE 1M 2402MHz Ant1



6dB Bandwidth NVNT BLE 1M 2440MHz Ant1

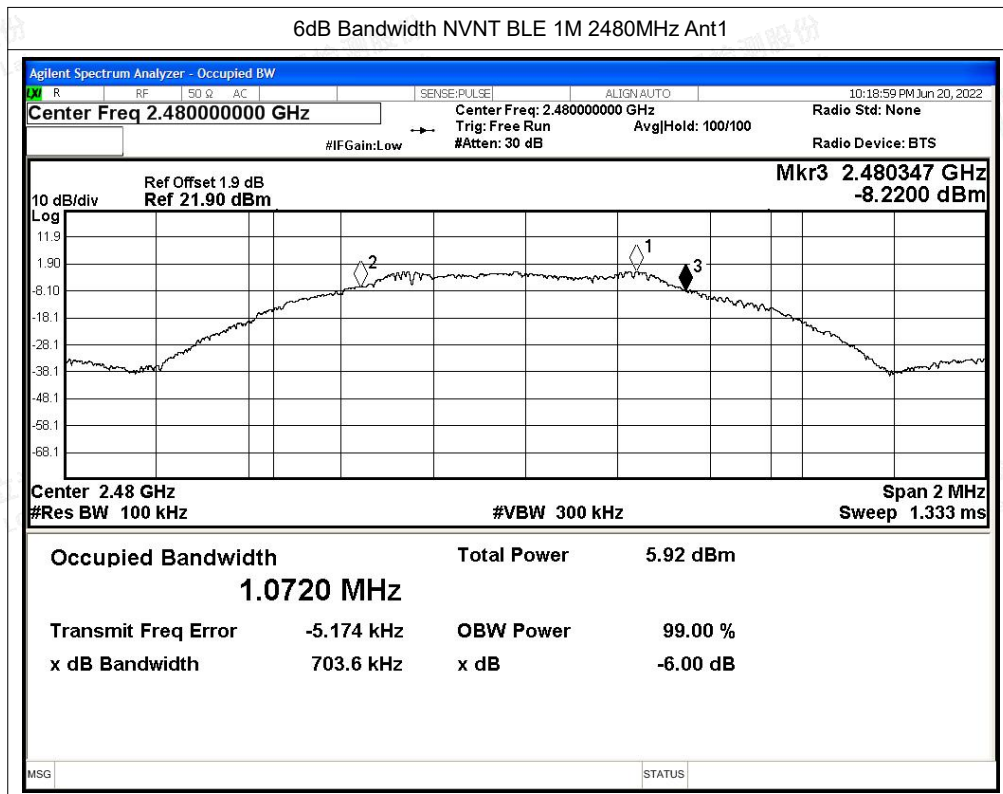


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## A.2 Maximum Conducted Output Power

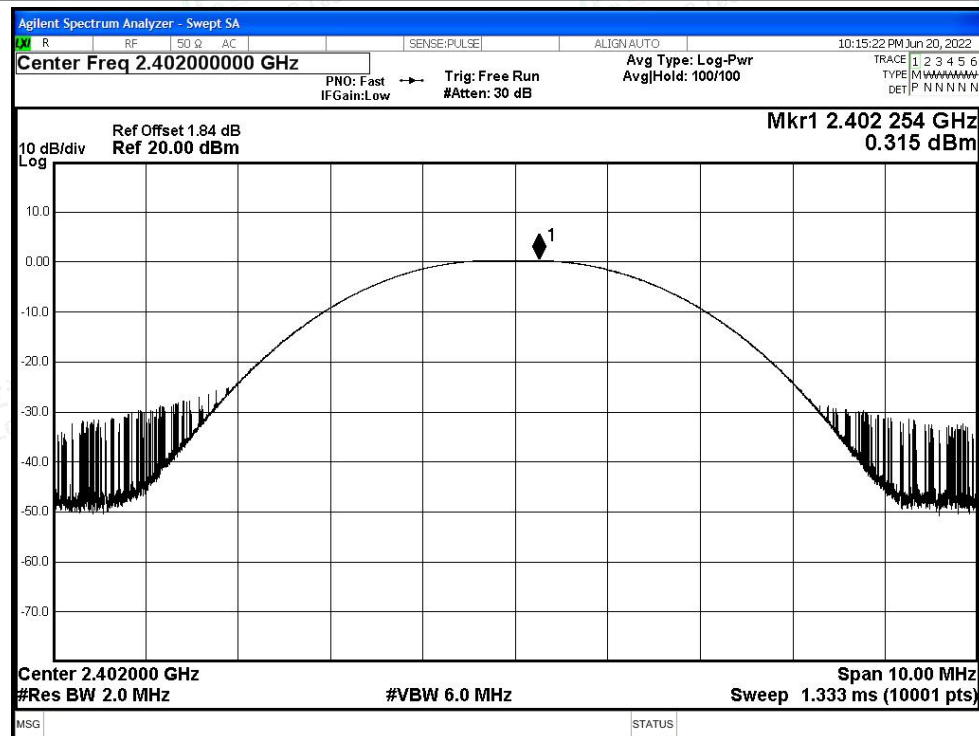
| Condition | Mode   | Frequency (MHz) | Antenna | Conducted Power (dBm) | Limit (dBm) | Verdict |
|-----------|--------|-----------------|---------|-----------------------|-------------|---------|
| NVNT      | BLE 1M | 2402            | Ant1    | 0.32                  | 30          | Pass    |
| NVNT      | BLE 1M | 2440            | Ant1    | 0.47                  | 30          | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 0.2                   | 30          | Pass    |



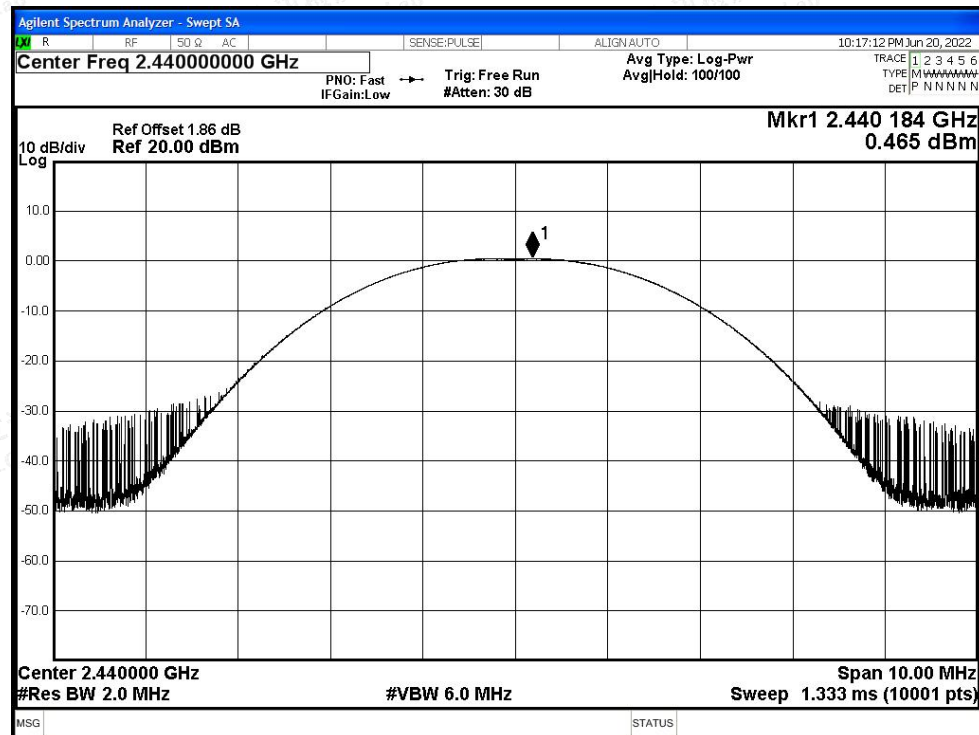


## Test Graphs

Power NVNT BLE 1M 2402MHz Ant1



Power NVNT BLE 1M 2440MHz Ant1

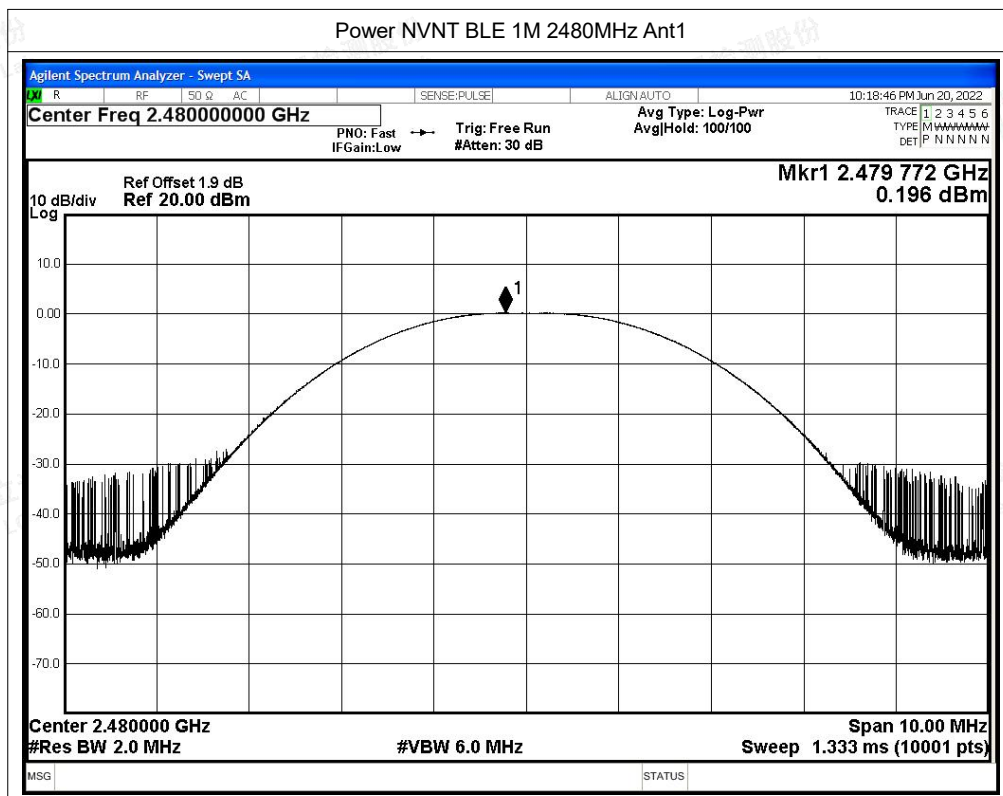


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### A.3 Maximum Power Spectral Density Level

| Condition | Mode   | Frequency (MHz) | Antenna | Conducted PSD (dBm/3kHz) | Limit (dBm/3kHz) | Verdict |
|-----------|--------|-----------------|---------|--------------------------|------------------|---------|
| NVNT      | BLE 1M | 2402            | Ant1    | -14.83                   | 8                | Pass    |
| NVNT      | BLE 1M | 2440            | Ant1    | -14.65                   | 8                | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | -14.91                   | 8                | Pass    |



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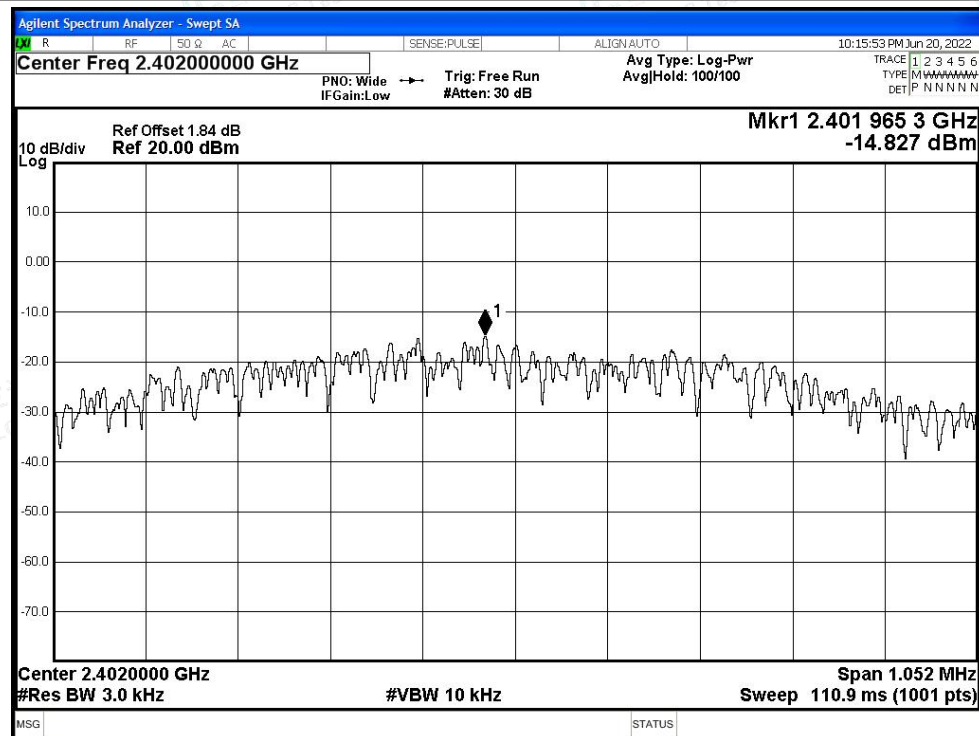
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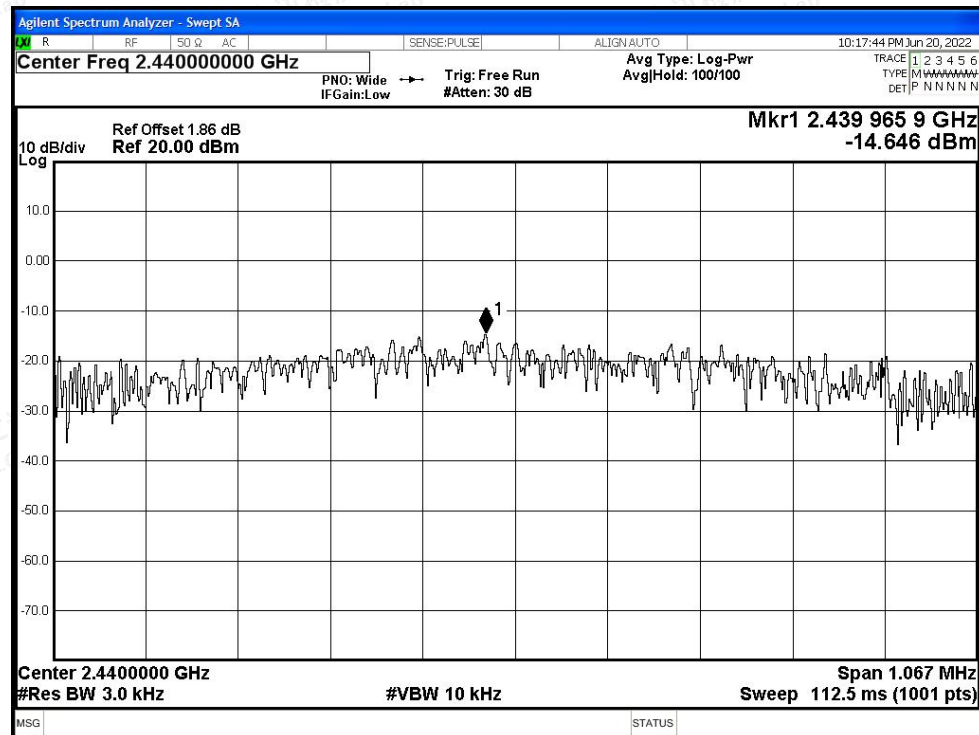


## Test Graphs

PSD NVNT BLE 1M 2402MHz Ant1



PSD NVNT BLE 1M 2440MHz Ant1

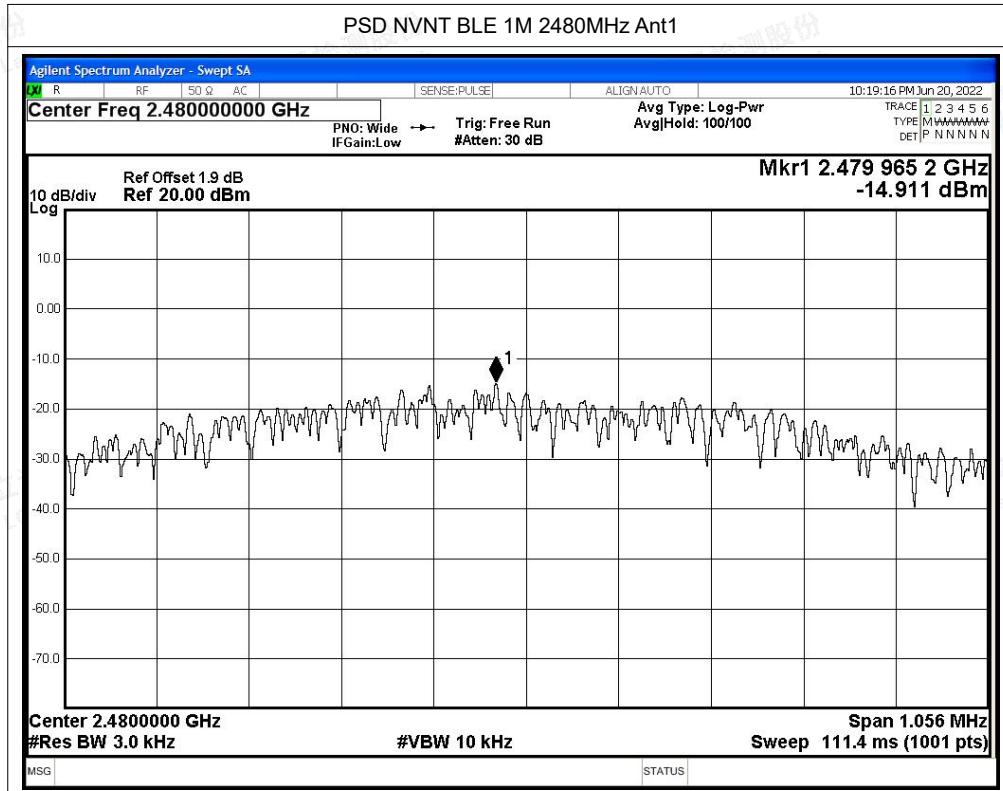


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### A.4 Band Edge

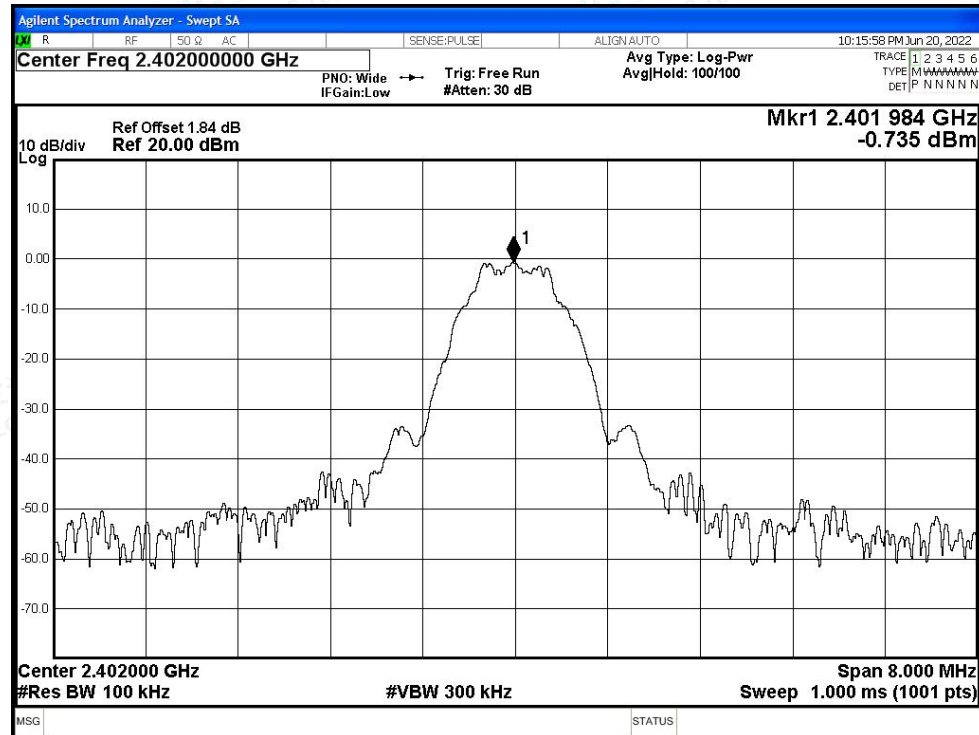
| Condition | Mode   | Frequency (MHz) | Antenna | Max Value (dBc) | Limit (dBc) | Verdict |
|-----------|--------|-----------------|---------|-----------------|-------------|---------|
| NVNT      | BLE 1M | 2402            | Ant1    | -47.1           | -20         | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | -51.87          | -20         | Pass    |



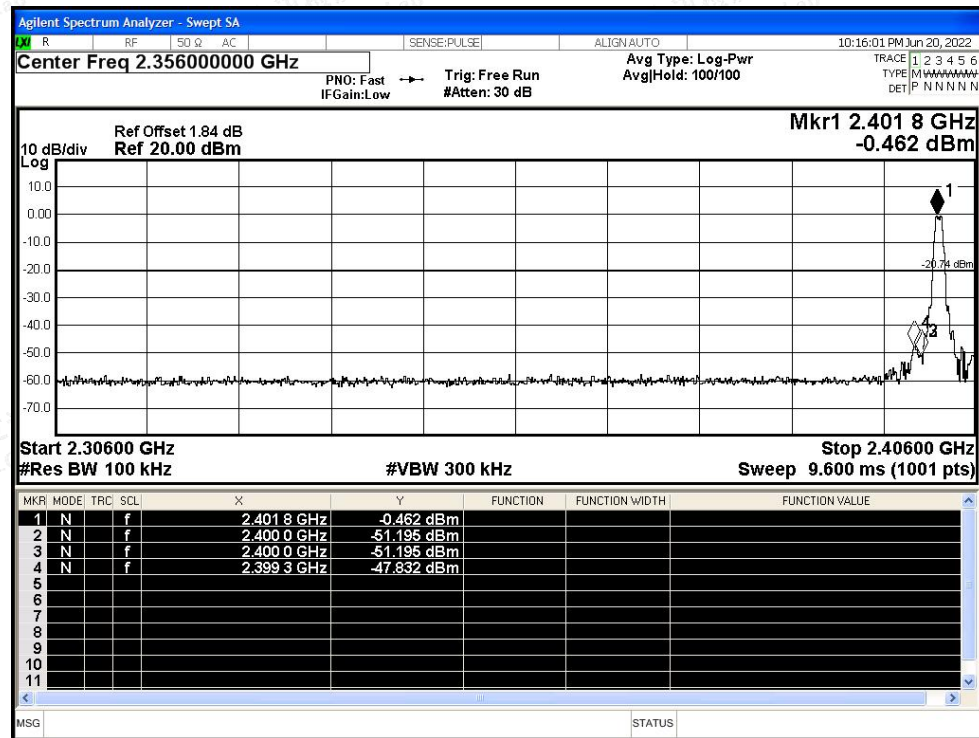


## Test Graphs

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



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



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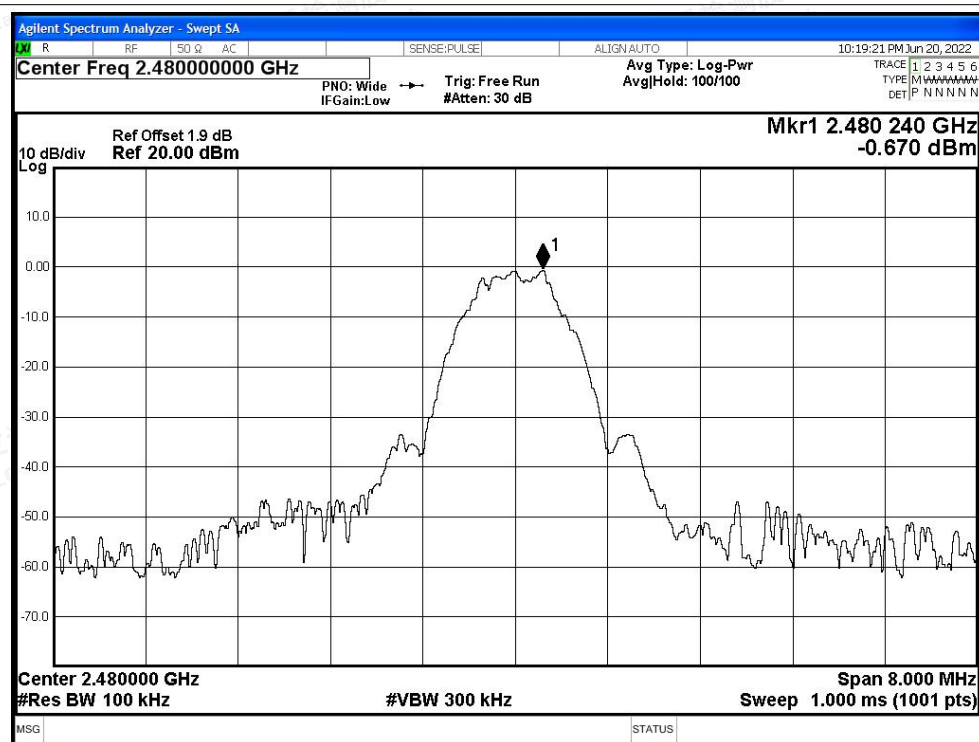
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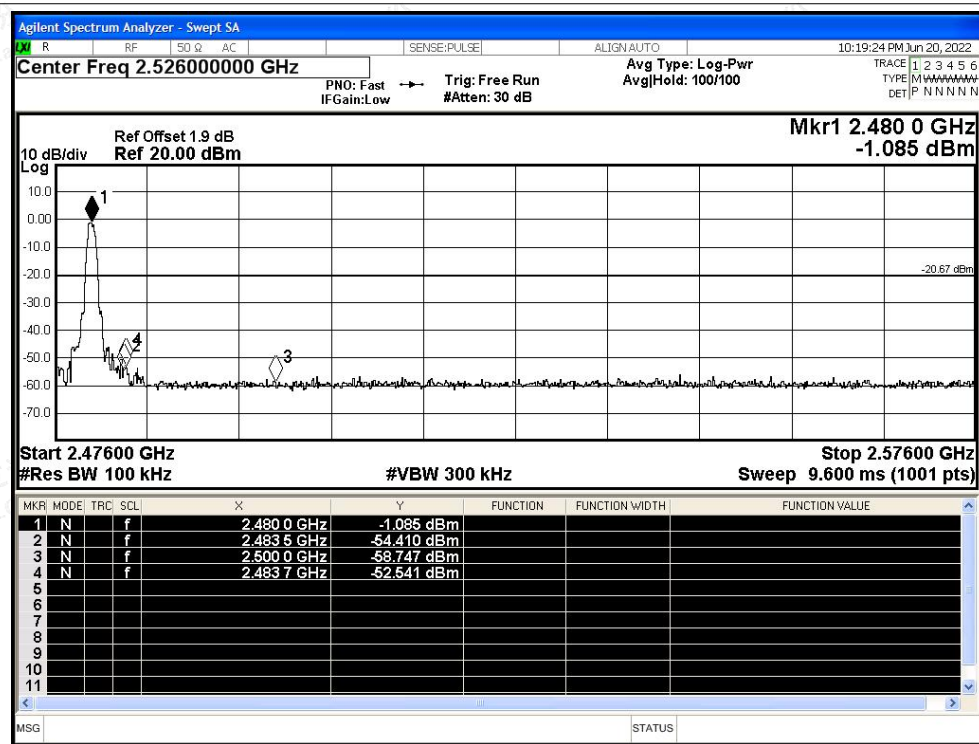
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## Band Edge NVNT BLE 1M 2480MHz Ant1 Ref



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



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A.5 Conducted RF Spurious Emission

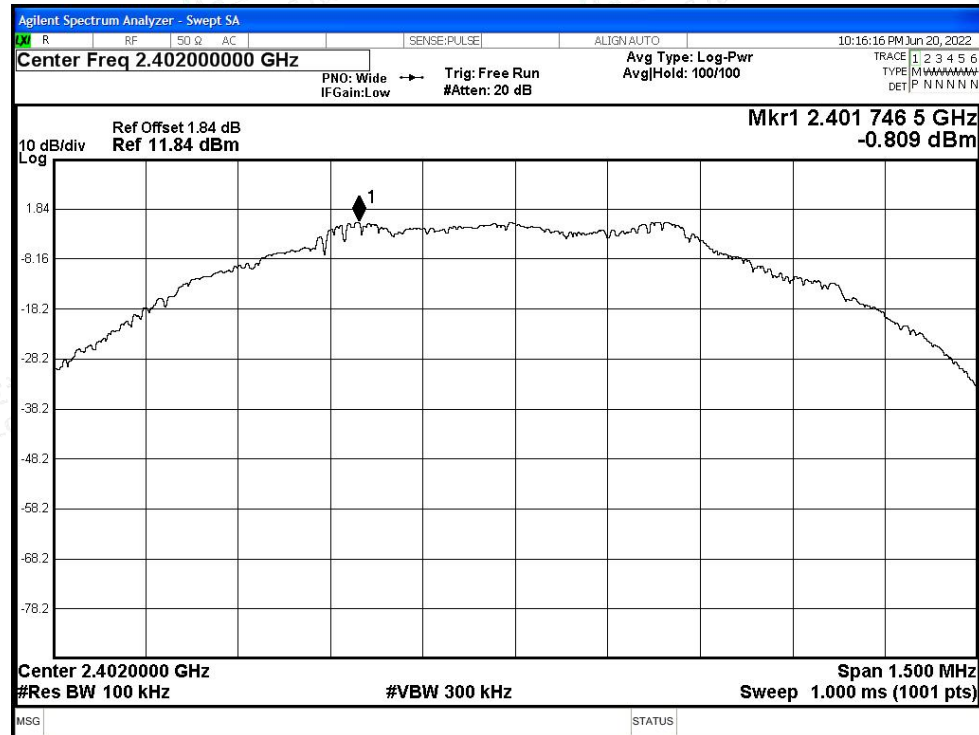
| Condition | Mode   | Frequency (MHz) | Antenna | Max Value (dBc) | Limit (dBc) | Verdict |
|-----------|--------|-----------------|---------|-----------------|-------------|---------|
| NVNT      | BLE 1M | 2402            | Ant1    | -55.08          | -20         | Pass    |
| NVNT      | BLE 1M | 2440            | Ant1    | -55.09          | -20         | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | -54.89          | -20         | Pass    |



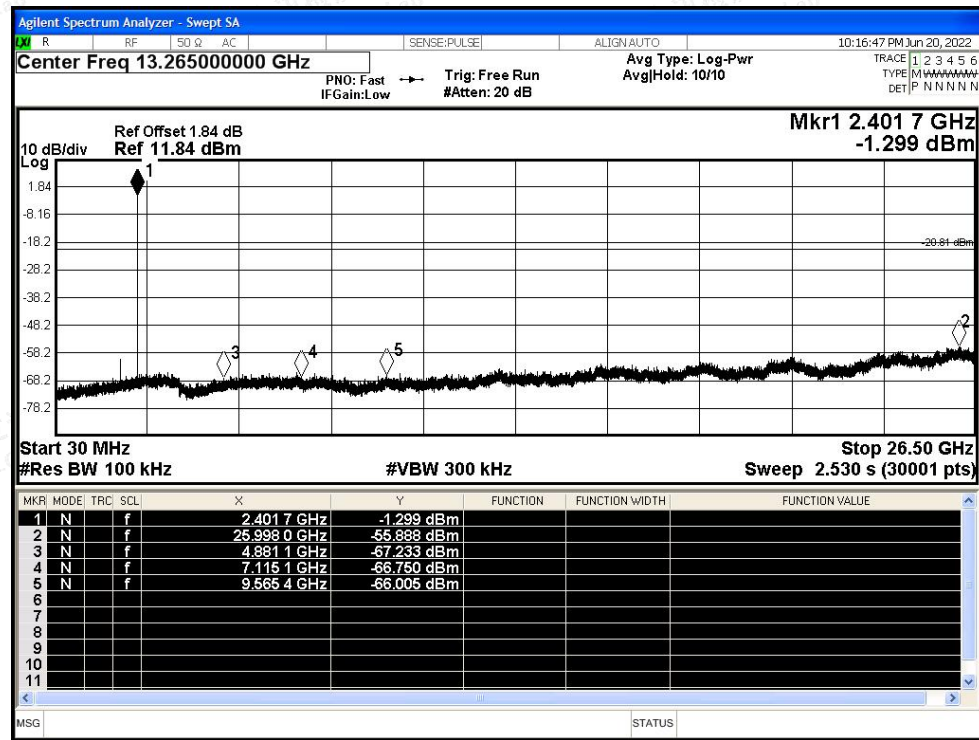


## Test Graphs

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



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



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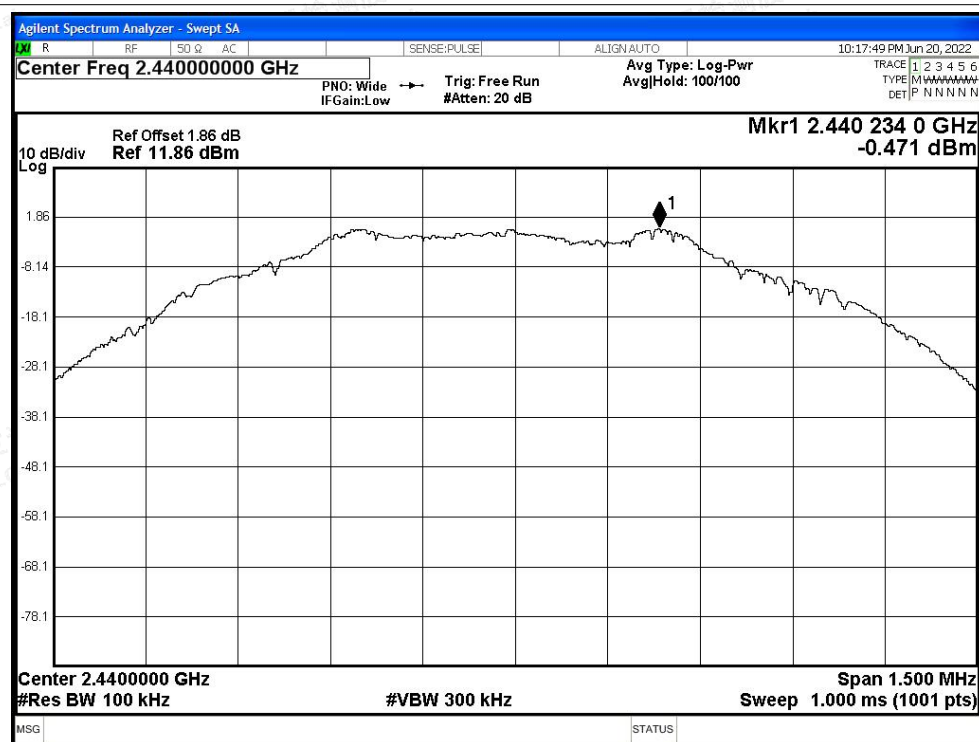
Add: 101, 201 Bldg A &amp; 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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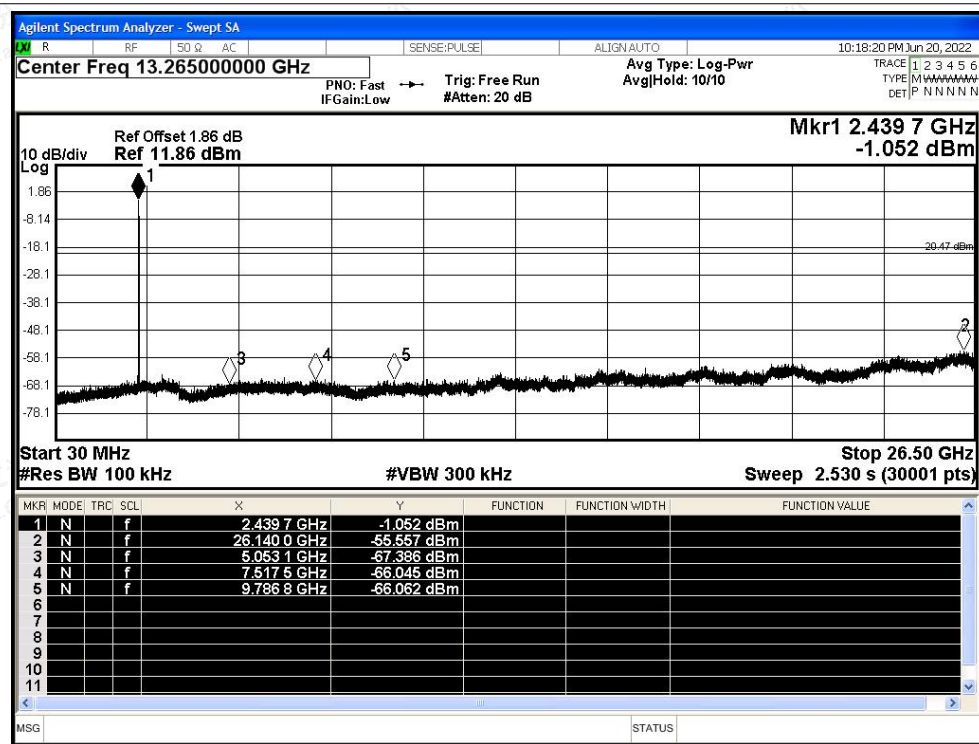
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## Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Ref



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



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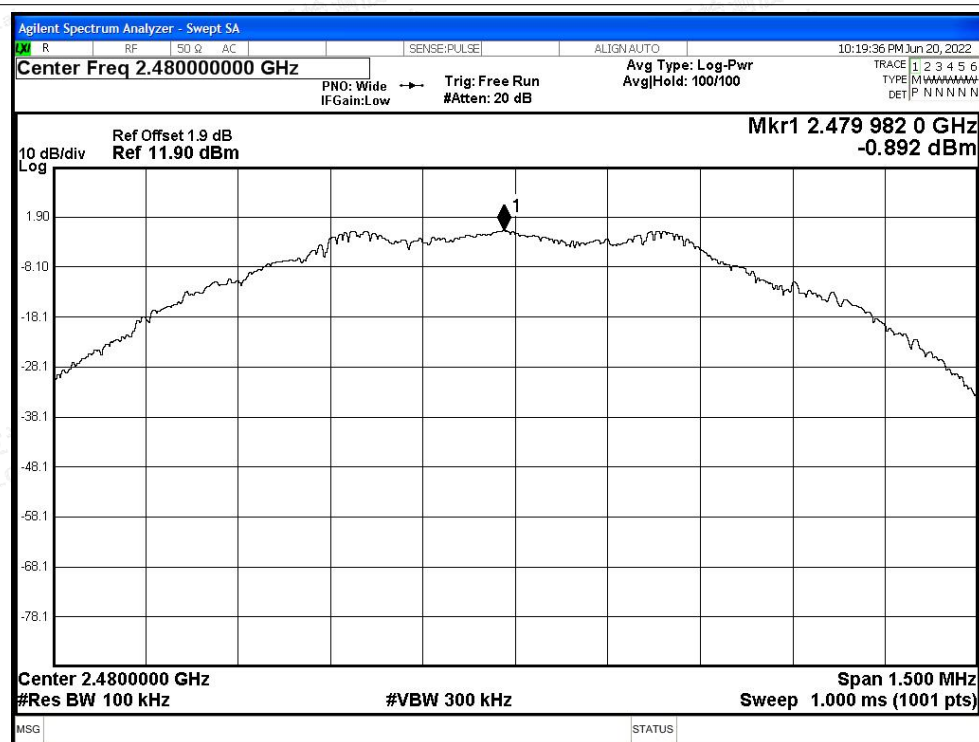
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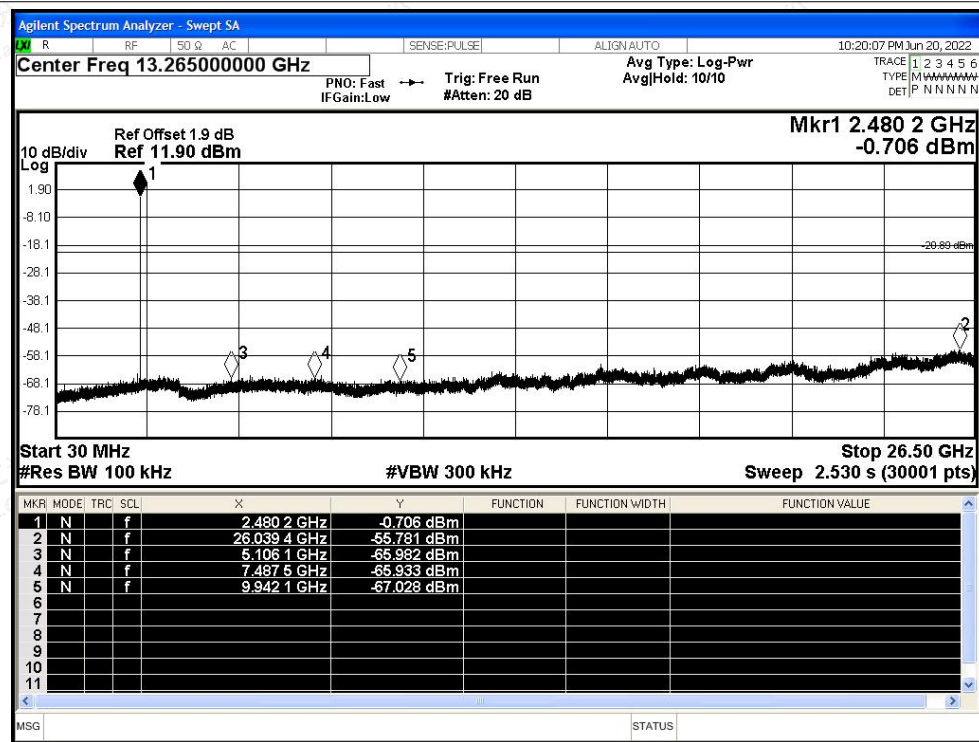
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## Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Ref



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



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### A.6 Duty Cycle

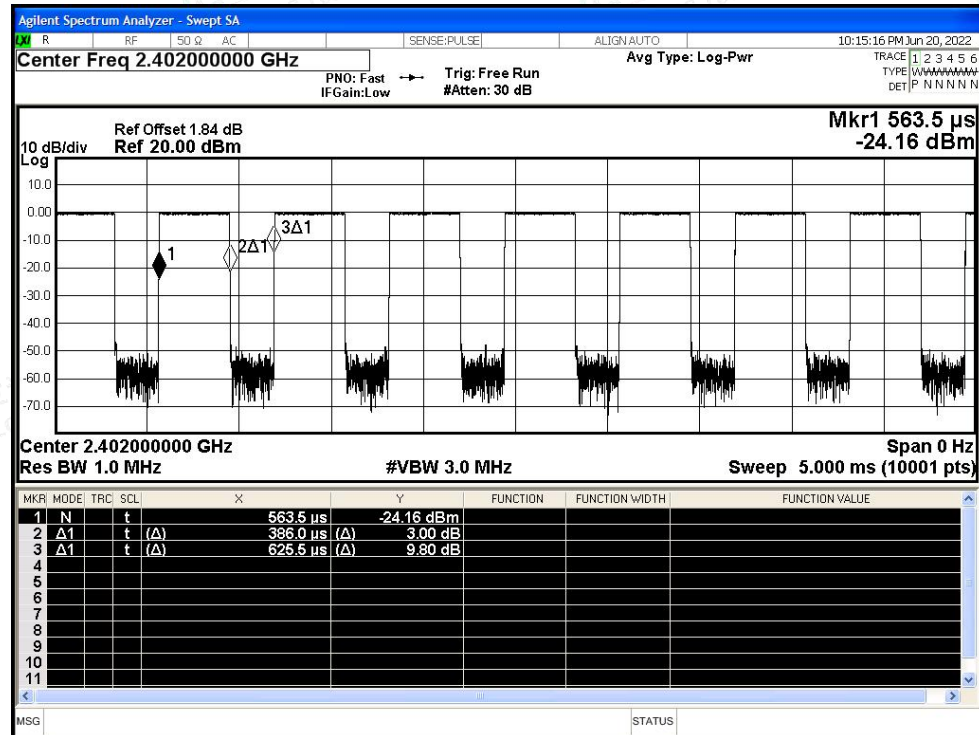
| Condition | Mode   | Frequency (MHz) | Antenna | Duty Cycle (%) | Correction Factor (dB) | 1/T (kHz) |
|-----------|--------|-----------------|---------|----------------|------------------------|-----------|
| NVNT      | BLE 1M | 2402            | Ant1    | 61.71          | 2.1                    | 2.59      |
| NVNT      | BLE 1M | 2440            | Ant1    | 61.68          | 2.1                    | 2.59      |
| NVNT      | BLE 1M | 2480            | Ant1    | 61.68          | 2.1                    | 2.59      |



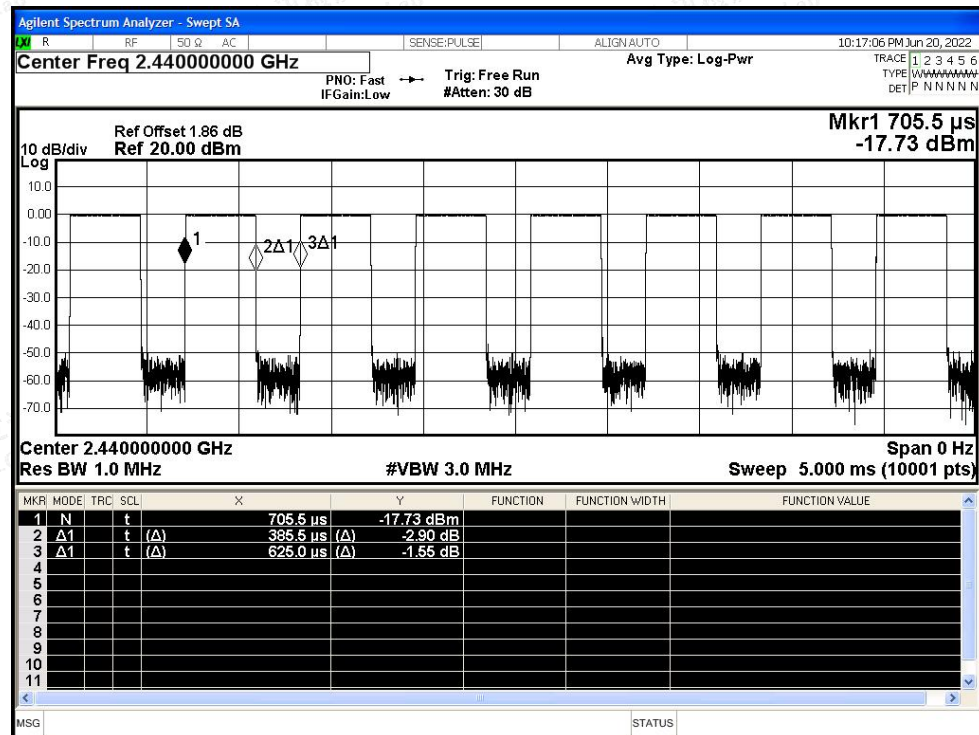


## Test Graphs

Duty Cycle NVNT BLE 1M 2402MHz Ant1



Duty Cycle NVNT BLE 1M 2440MHz Ant1

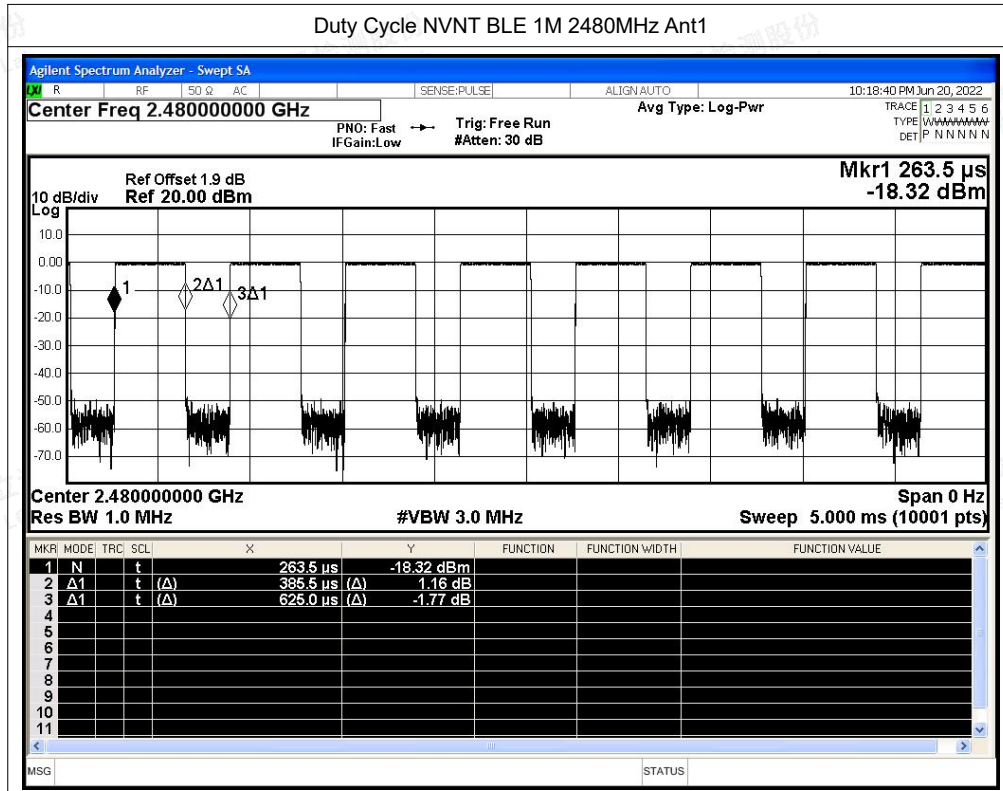


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## A.7 Restrict Band

| Condition | Mode   | Frequency (MHz) | Antenna | Spur Freq (MHz) | Power (dBm) | Gain (dBi) | E (dBuV/m) | Detector | Limit (dBuV/m) | Verdict |
|-----------|--------|-----------------|---------|-----------------|-------------|------------|------------|----------|----------------|---------|
| NVNT      | BLE 1M | 2402            | Ant1    | 2310            | -50.74      | 2          | 46.52      | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2402            | Ant1    | 2310            | -60.06      | 2          | 37.2       | Average  | 54             | Pass    |
| NVNT      | BLE 1M | 2402            | Ant1    | 2347.92         | -47.79      | 2          | 49.47      | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2402            | Ant1    | 2370.192        | -59.05      | 2          | 38.21      | Average  | 54             | Pass    |
| NVNT      | BLE 1M | 2402            | Ant1    | 2390            | -50.41      | 2          | 46.85      | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2402            | Ant1    | 2390            | -59.66      | 2          | 37.6       | Average  | 54             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2483.5          | -38.11      | 2          | 59.15      | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2483.5          | -58.93      | 2          | 38.33      | Average  | 54             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2483.632        | -36.3       | 2          | 60.96      | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2484.88         | -58.56      | 2          | 38.7       | Average  | 54             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2500            | -49.88      | 2          | 47.38      | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2500            | -59.12      | 2          | 38.14      | Average  | 54             | Pass    |



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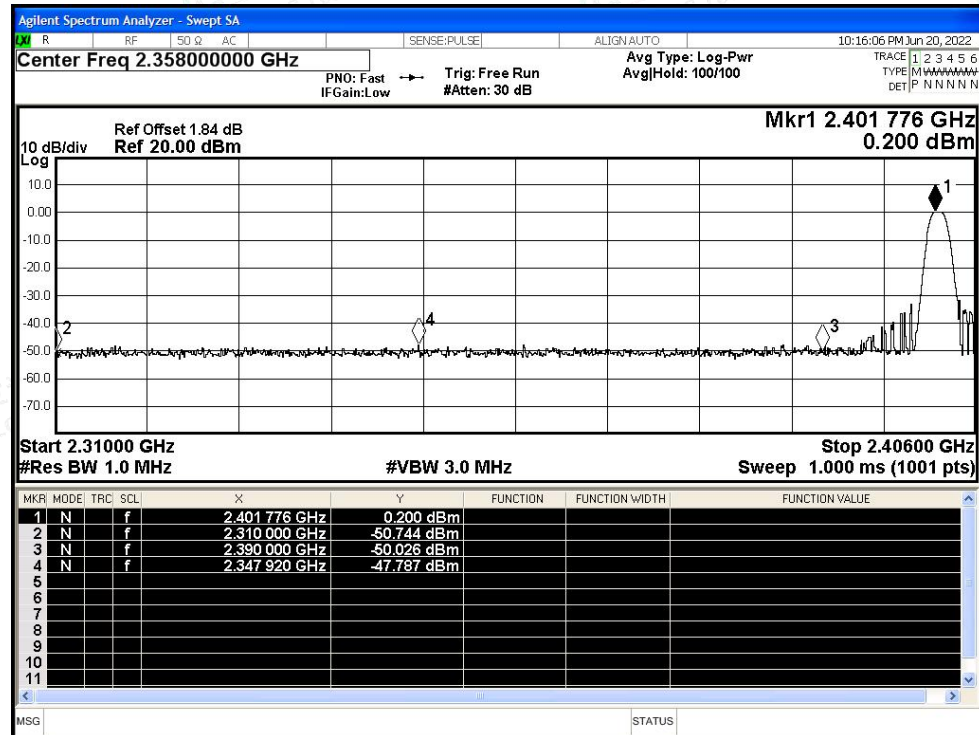
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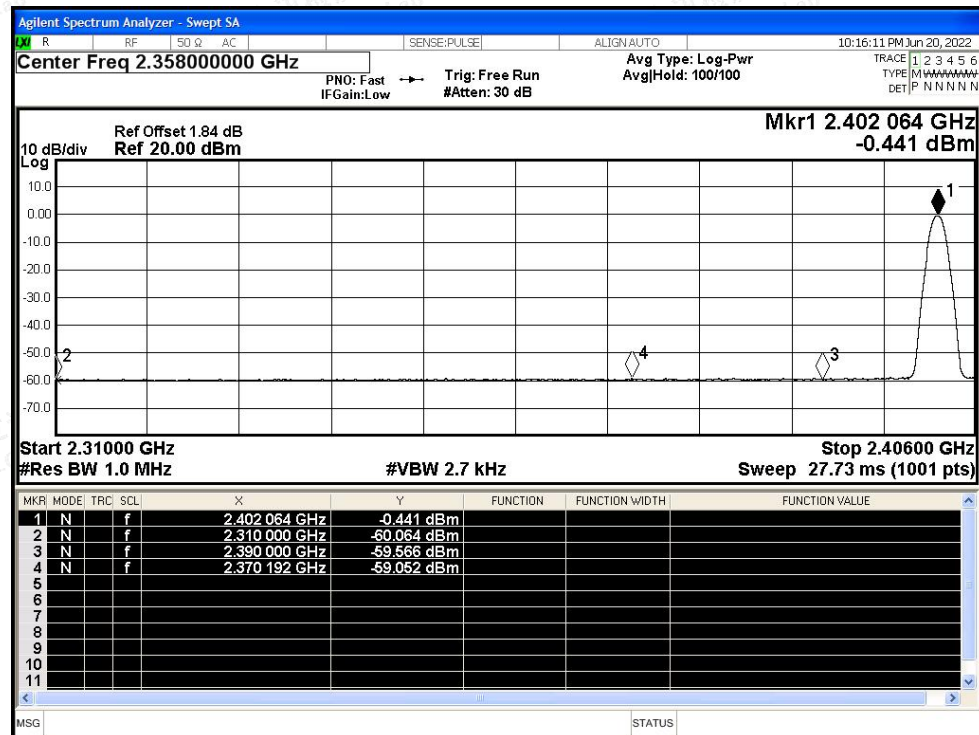


## Test Graphs

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



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



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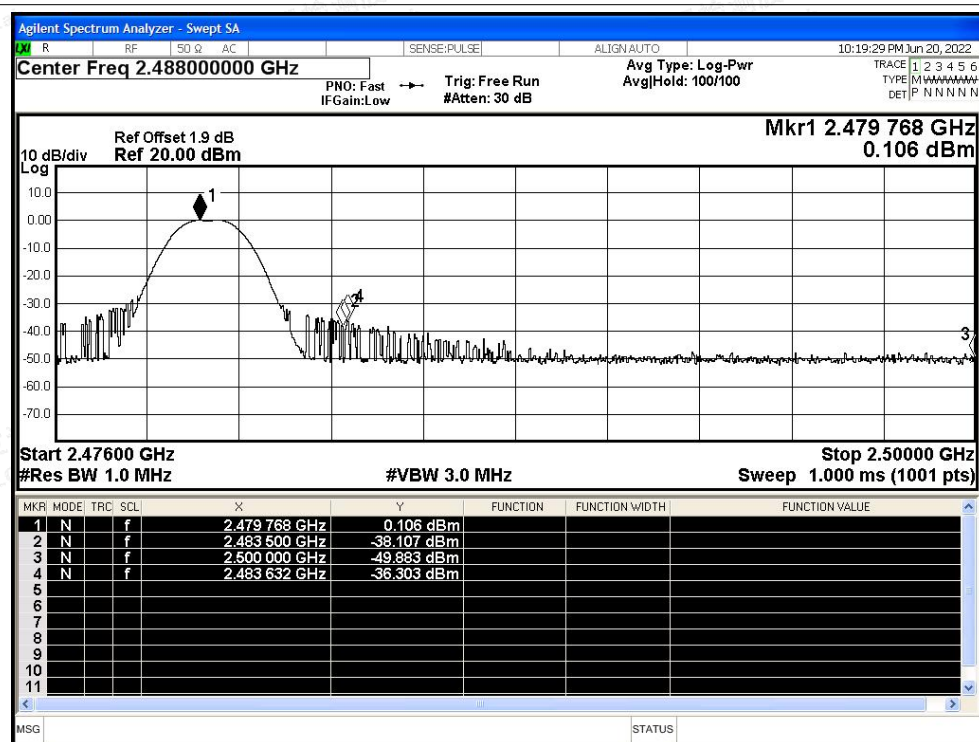
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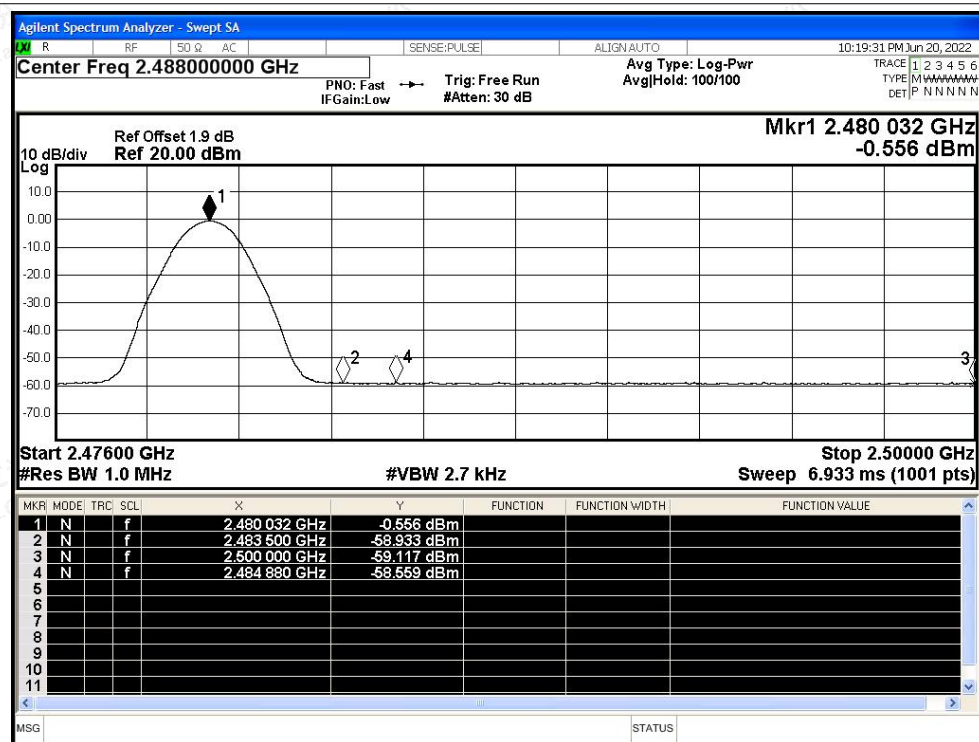
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## Restrict Band NVNT BLE 1M 2480MHz Ant1 Peak



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



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