



## Appendix B

### RF Test Data for BT LE(Conducted Measurement)

Product Name: Touch all in one

Test Model: 2151E

#### Environmental Conditions

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



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Baoan District, Shenzhen, 518000, China  
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## B.1 -6dB Bandwidth

| Condition | Mode   | Frequency (MHz) | Antenna | -6 dB Bandwidth (MHz) | Limit -6 dB Bandwidth (MHz) | Verdict |
|-----------|--------|-----------------|---------|-----------------------|-----------------------------|---------|
| NVNT      | BLE 1M | 2402            | Ant1    | 0.645                 | $\geq 0.5$                  | Pass    |
| NVNT      | BLE 1M | 2440            | Ant1    | 0.655                 | $\geq 0.5$                  | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 0.649                 | $\geq 0.5$                  | Pass    |
| NVNT      | BLE 2M | 2402            | Ant1    | 1.157                 | $\geq 0.5$                  | Pass    |
| NVNT      | BLE 2M | 2440            | Ant1    | 1.122                 | $\geq 0.5$                  | Pass    |
| NVNT      | BLE 2M | 2480            | Ant1    | 1.161                 | $\geq 0.5$                  | Pass    |

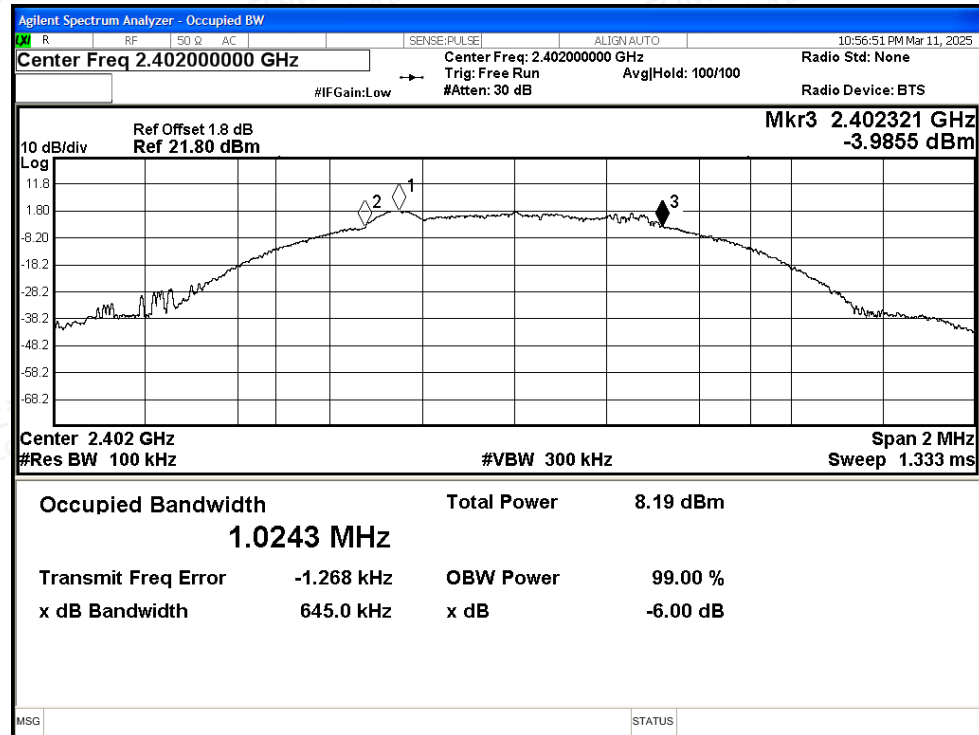


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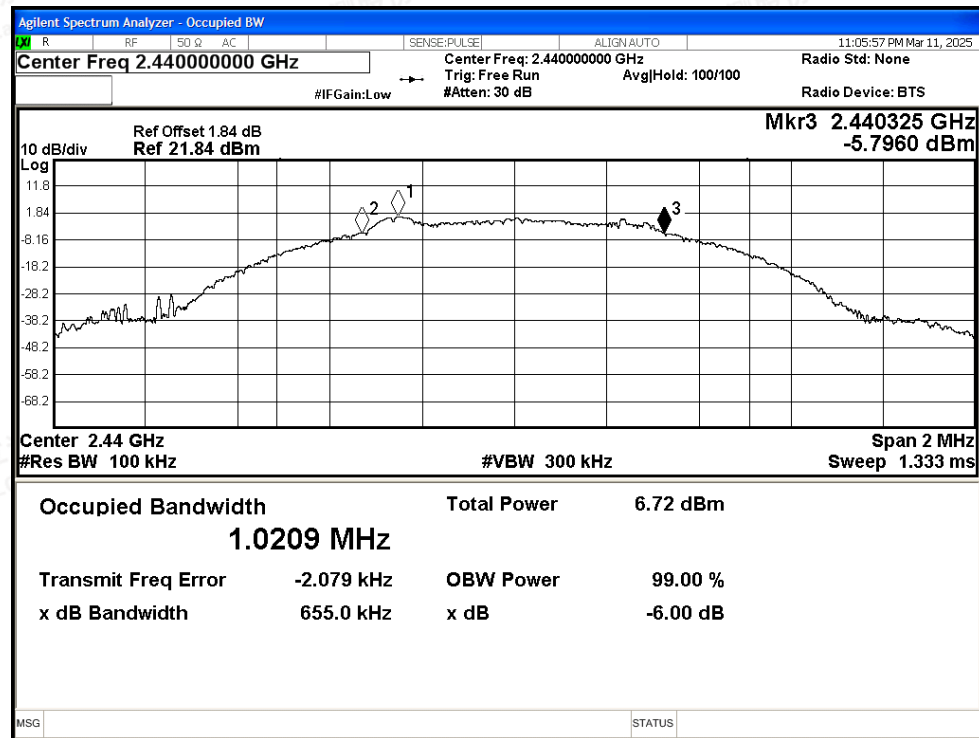


## Test Graphs

-6dB Bandwidth NVNT BLE 1M 2402MHz Ant1



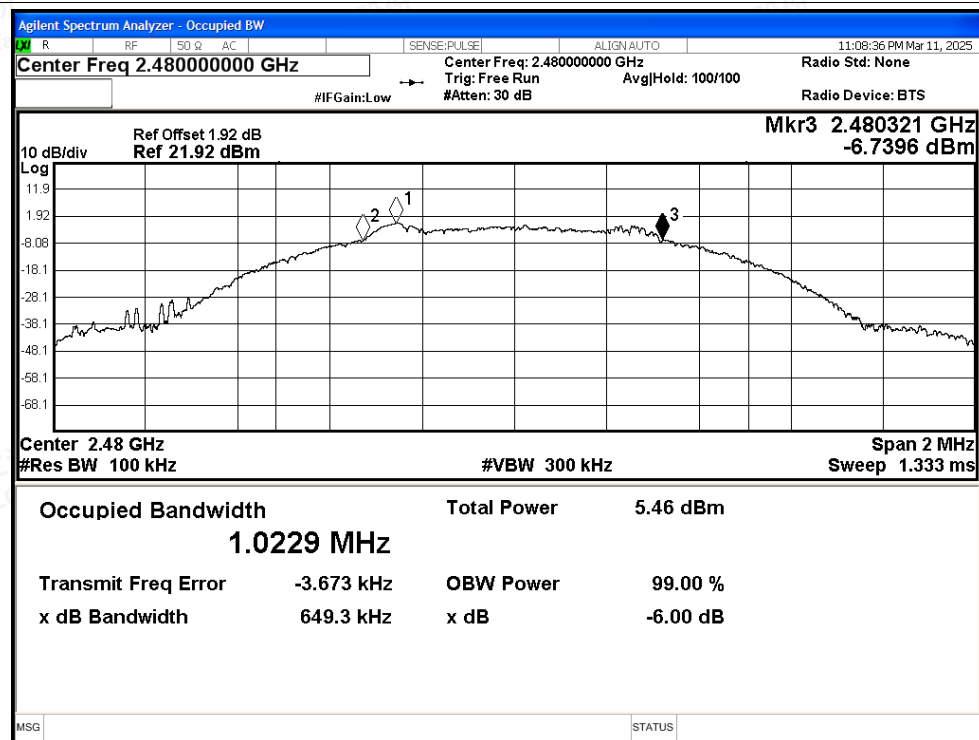
-6dB Bandwidth NVNT BLE 1M 2440MHz Ant1



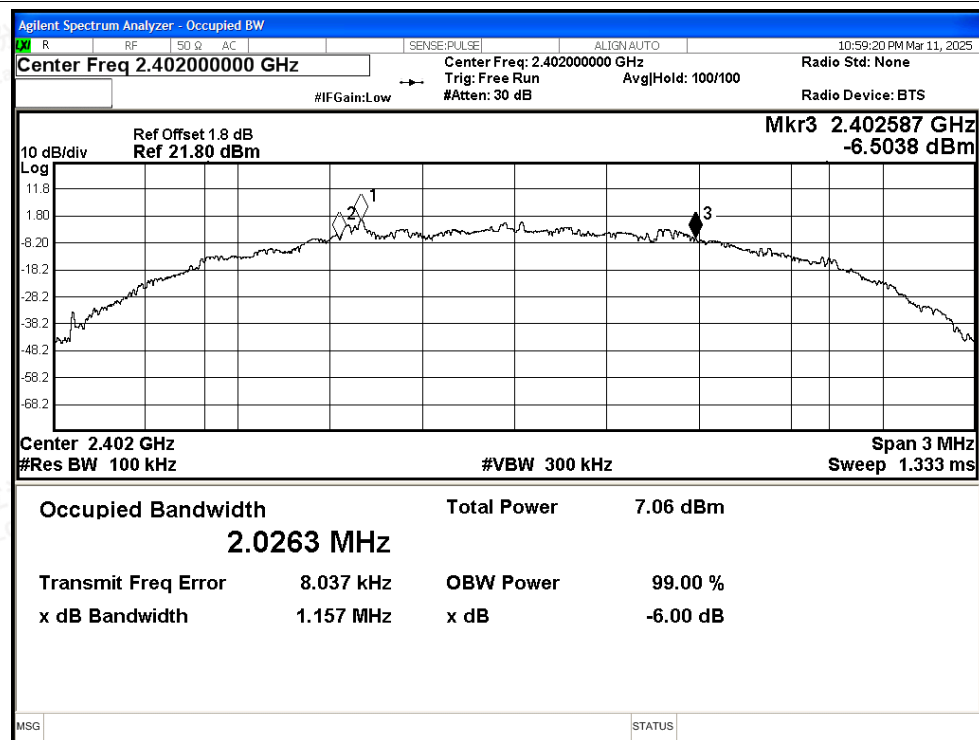
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## -6dB Bandwidth NVNT BLE 1M 2480MHz Ant1

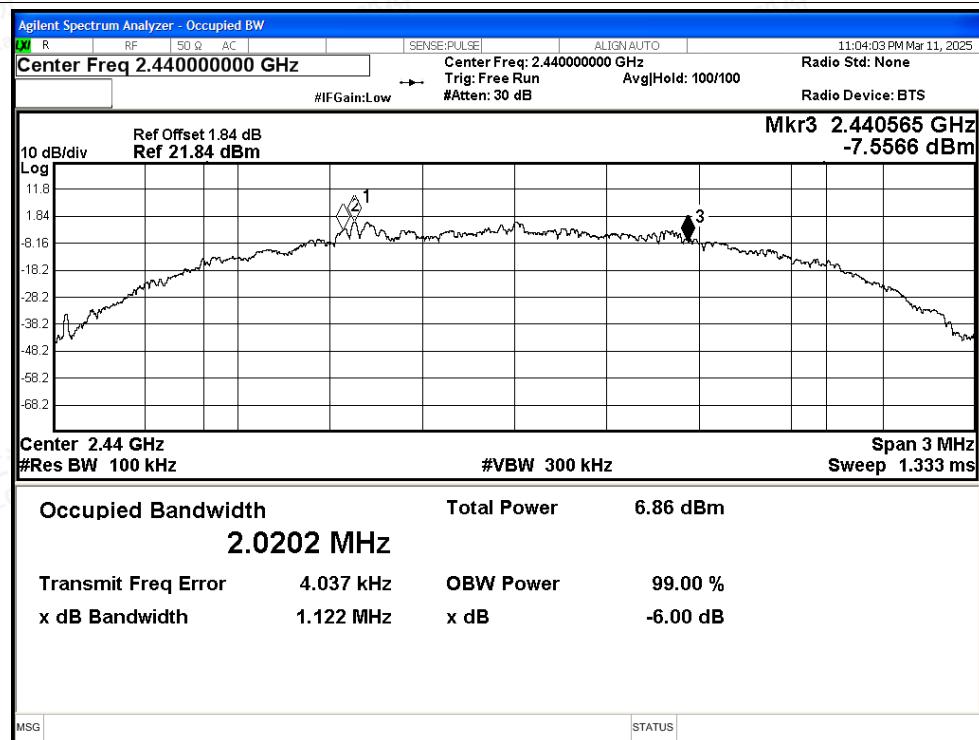


## -6dB Bandwidth NVNT BLE 2M 2402MHz Ant1

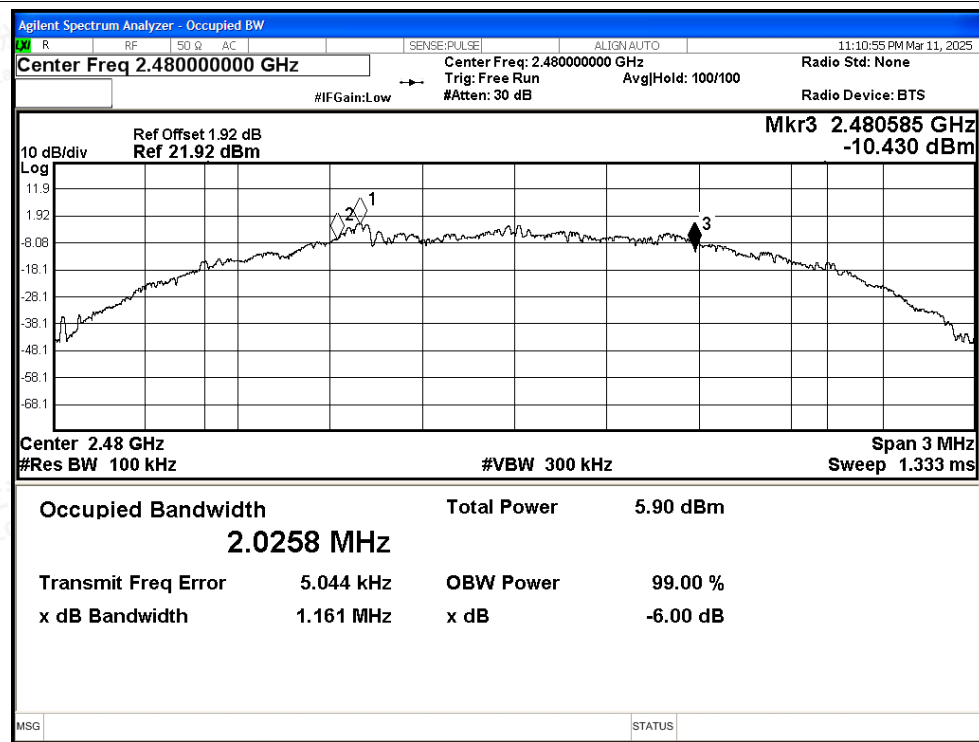




## -6dB Bandwidth NVNT BLE 2M 2440MHz Ant1



## -6dB Bandwidth NVNT BLE 2M 2480MHz Ant1





## B.2 Maximum Conducted Output Power

| Condition | Mode   | Frequency (MHz) | Antenna | Conducted Power (dBm) | Limit (dBm) | Verdict |
|-----------|--------|-----------------|---------|-----------------------|-------------|---------|
| NVNT      | BLE 1M | 2402            | Ant1    | 0.95                  | 30          | Pass    |
| NVNT      | BLE 1M | 2440            | Ant1    | 0.83                  | 30          | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | -0.4                  | 30          | Pass    |
| NVNT      | BLE 2M | 2402            | Ant1    | 0.87                  | 30          | Pass    |
| NVNT      | BLE 2M | 2440            | Ant1    | 0.51                  | 30          | Pass    |
| NVNT      | BLE 2M | 2480            | Ant1    | -0.55                 | 30          | Pass    |

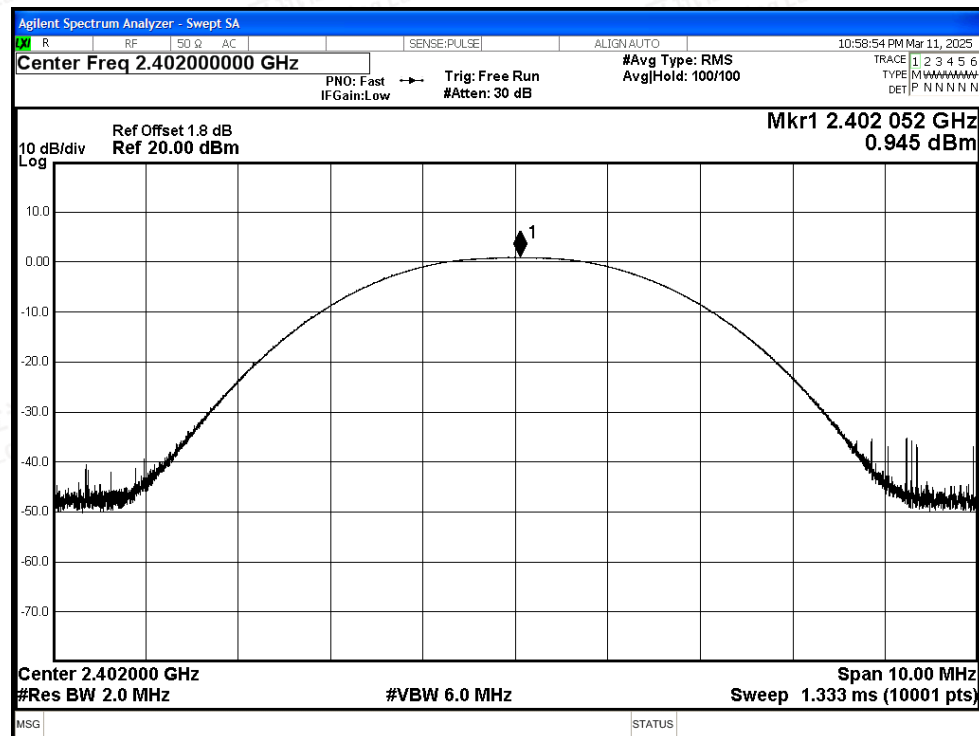


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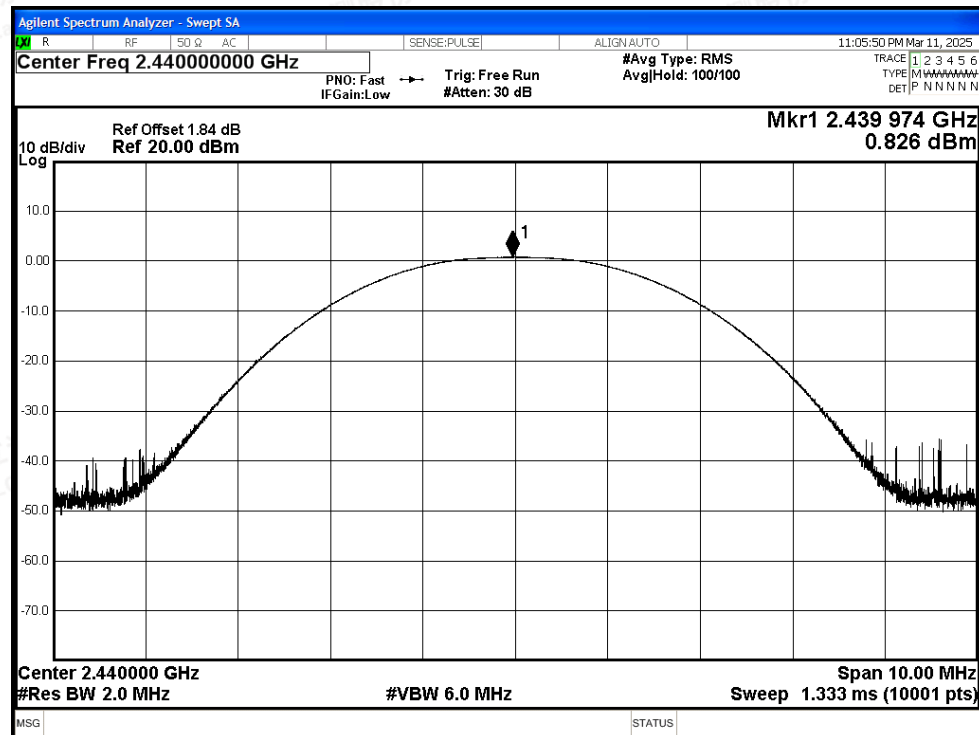


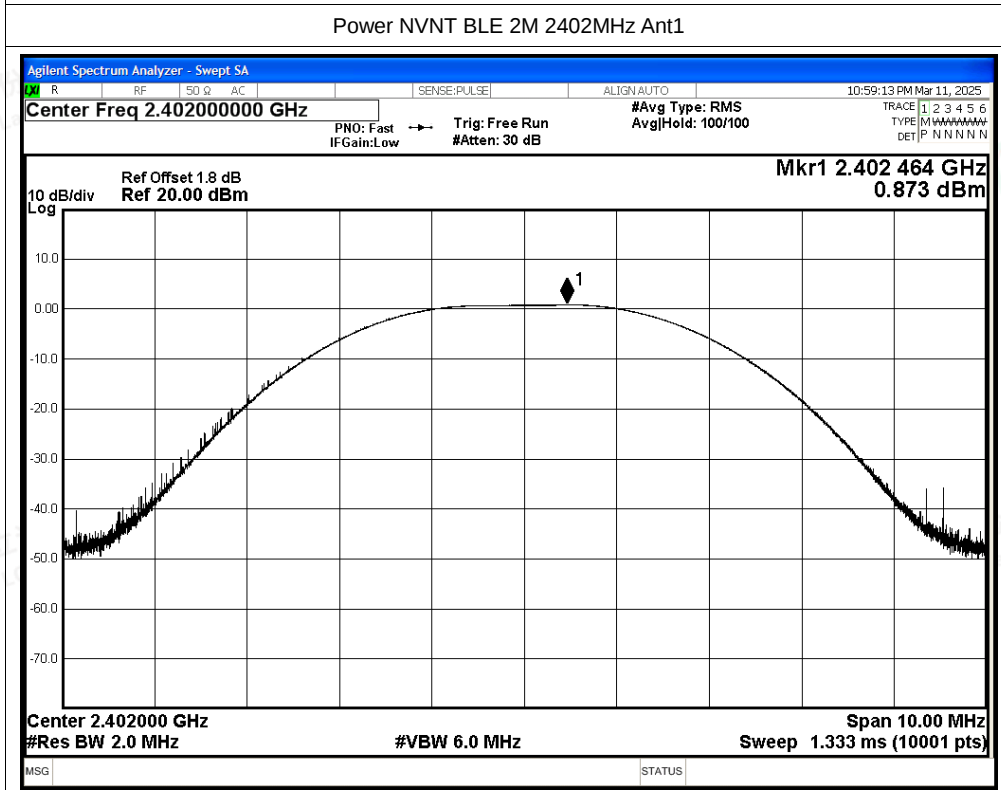
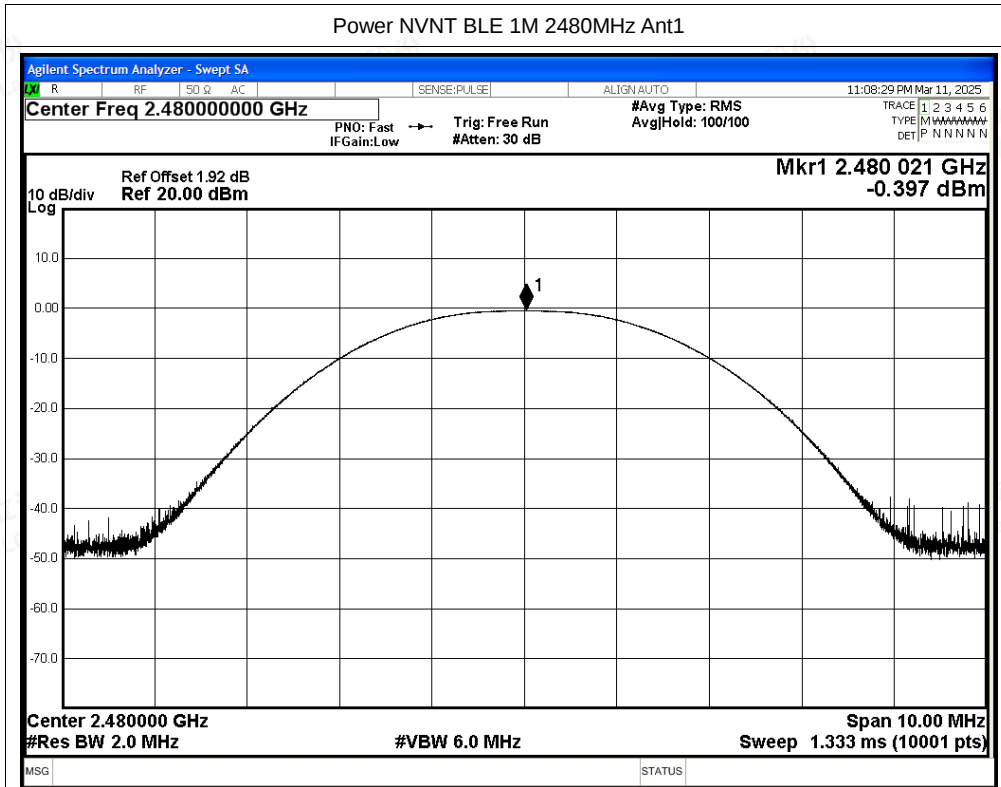
## Test Graphs

Power NVNT BLE 1M 2402MHz Ant1



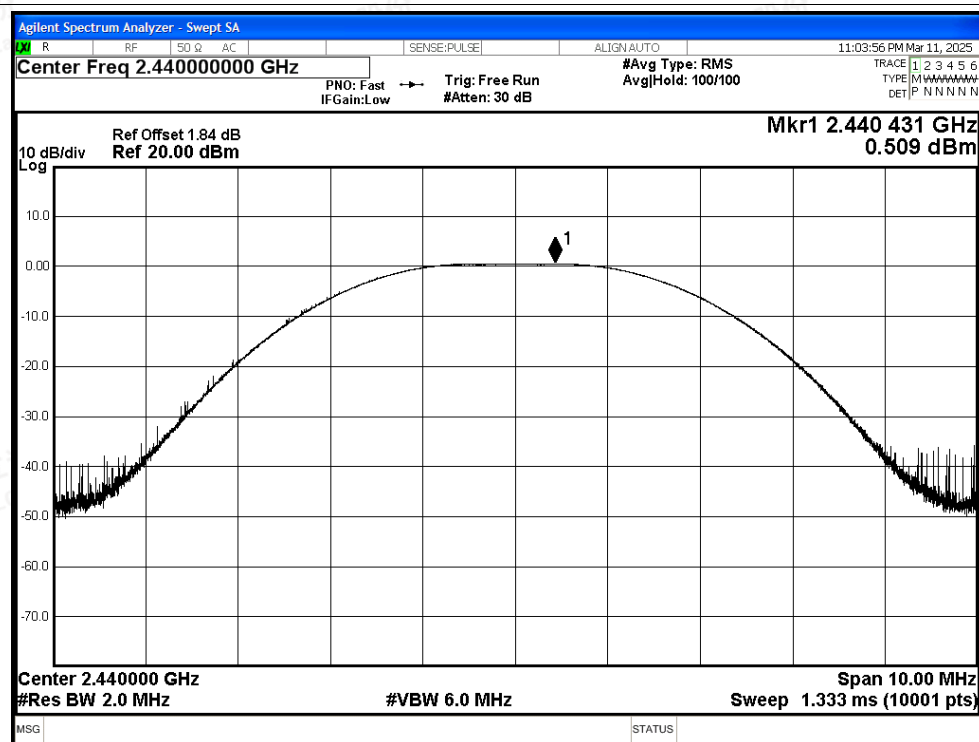
Power NVNT BLE 1M 2440MHz Ant1



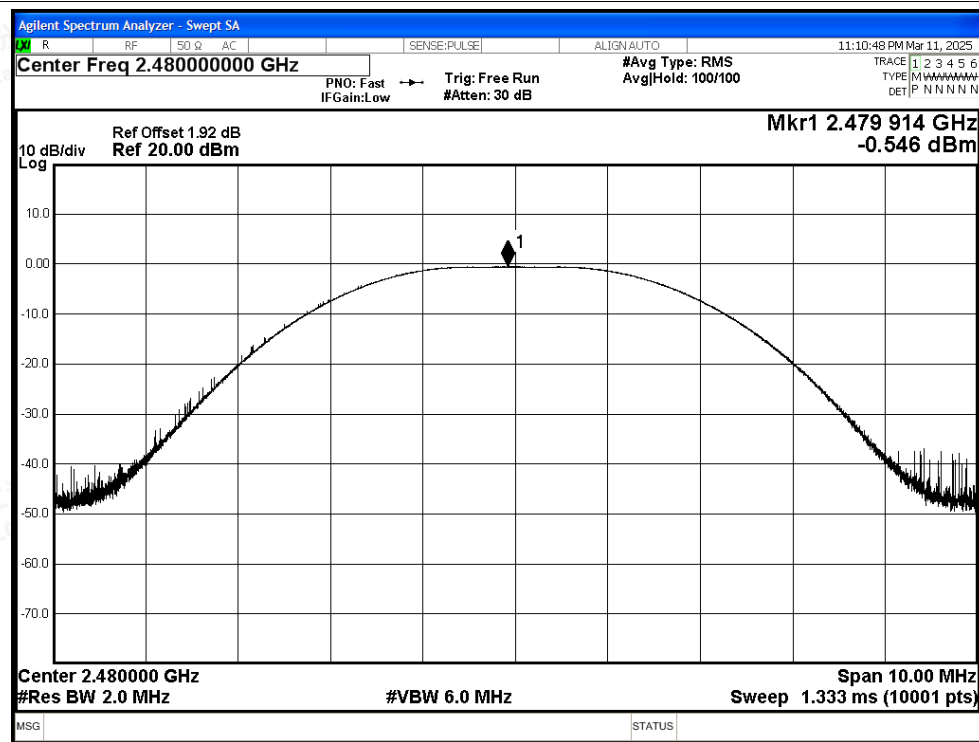




Power NVNT BLE 2M 2440MHz Ant1



Power NVNT BLE 2M 2480MHz Ant1





### B.3 Maximum Power Spectral Density Level

| Condition | Mode   | Frequency (MHz) | Antenna | Conducted PSD (dBm/3kHz) | Limit (dBm/3kHz) | Verdict |
|-----------|--------|-----------------|---------|--------------------------|------------------|---------|
| NVNT      | BLE 1M | 2402            | Ant1    | -14.24                   | 8                | Pass    |
| NVNT      | BLE 1M | 2440            | Ant1    | -15.82                   | 8                | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | -16.91                   | 8                | Pass    |
| NVNT      | BLE 2M | 2402            | Ant1    | -18.77                   | 8                | Pass    |
| NVNT      | BLE 2M | 2440            | Ant1    | -19.57                   | 8                | Pass    |
| NVNT      | BLE 2M | 2480            | Ant1    | -20.29                   | 8                | Pass    |

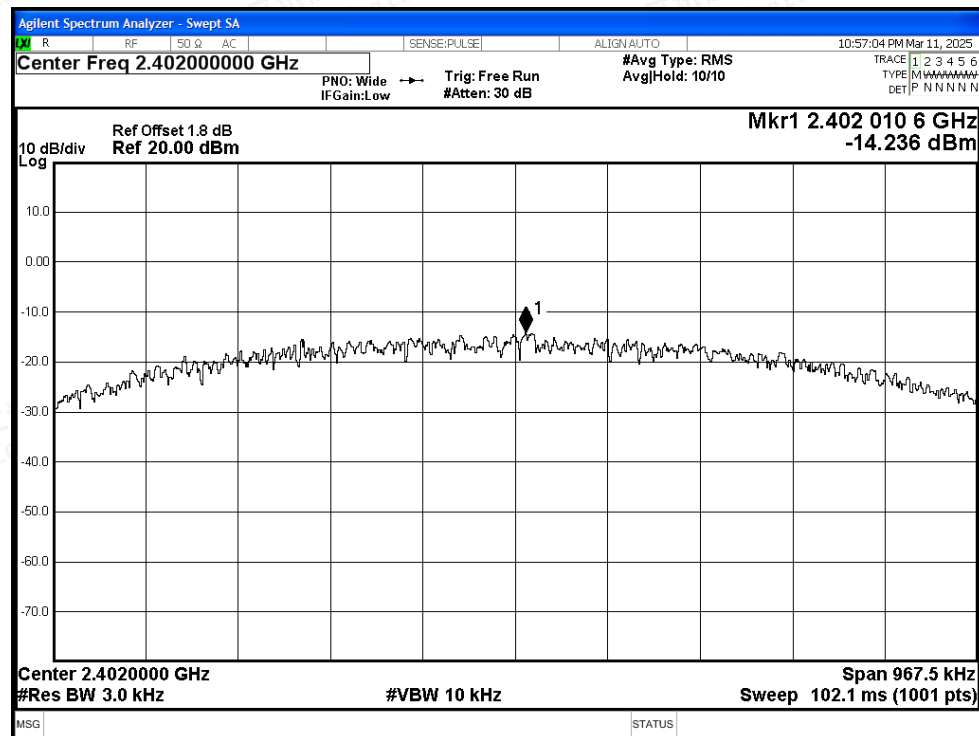


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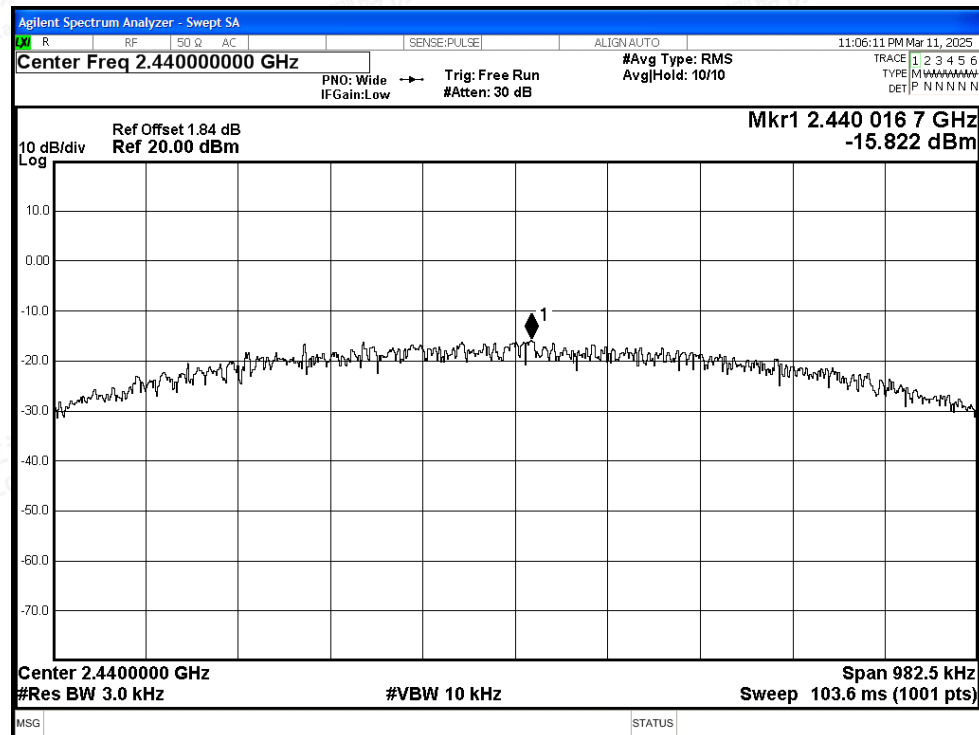


## Test Graphs

PSD NVNT BLE 1M 2402MHz Ant1



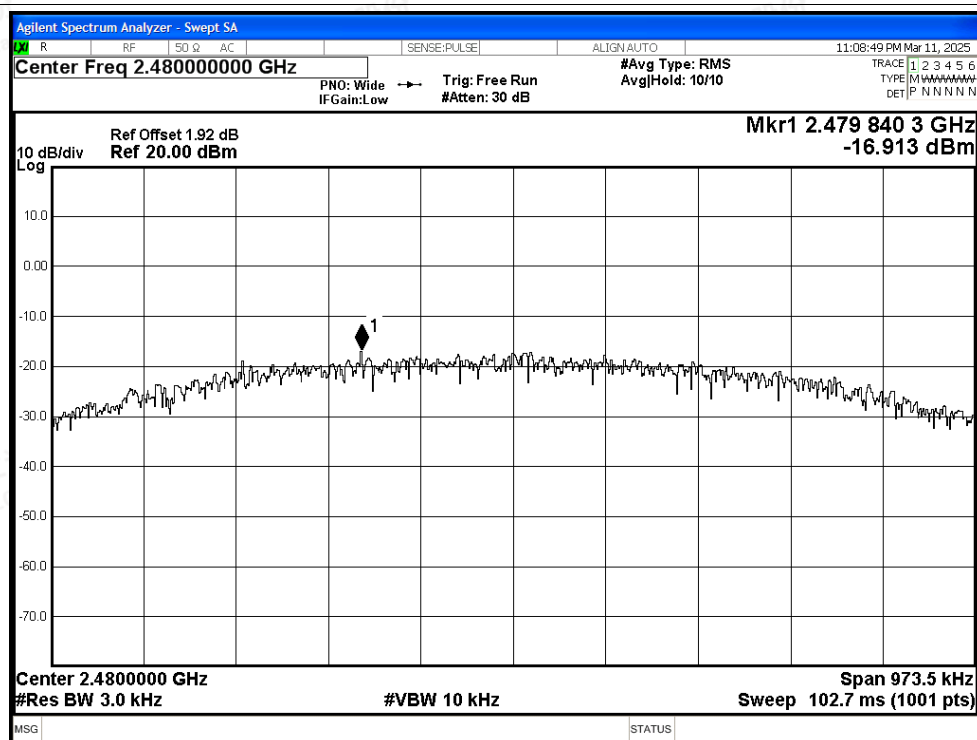
PSD NVNT BLE 1M 2440MHz Ant1



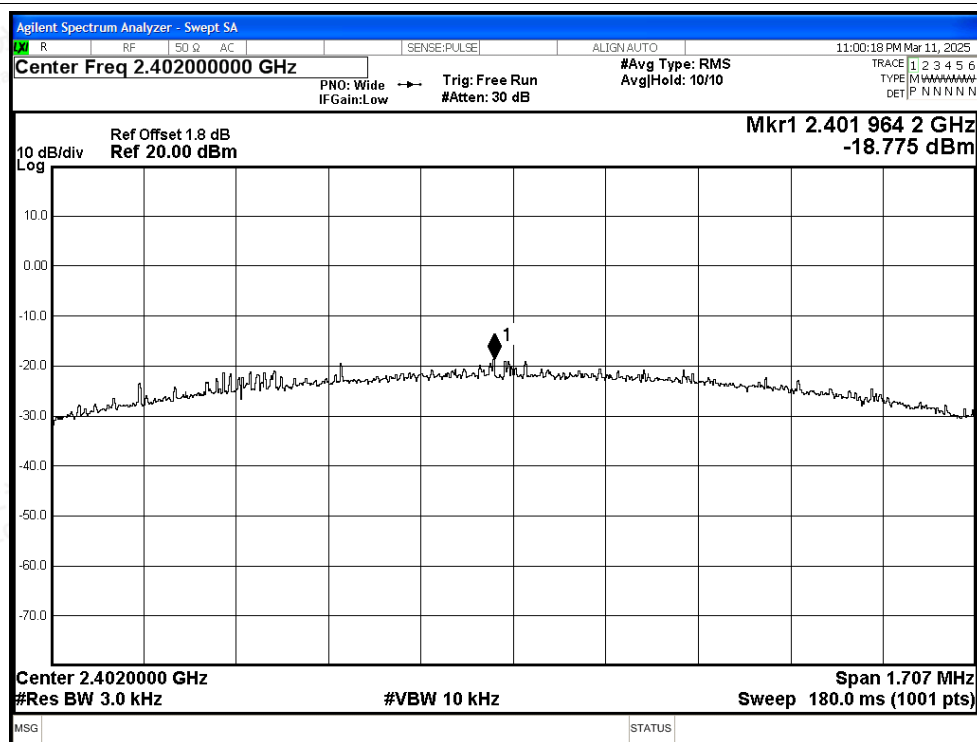
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## PSD NVNT BLE 1M 2480MHz Ant1

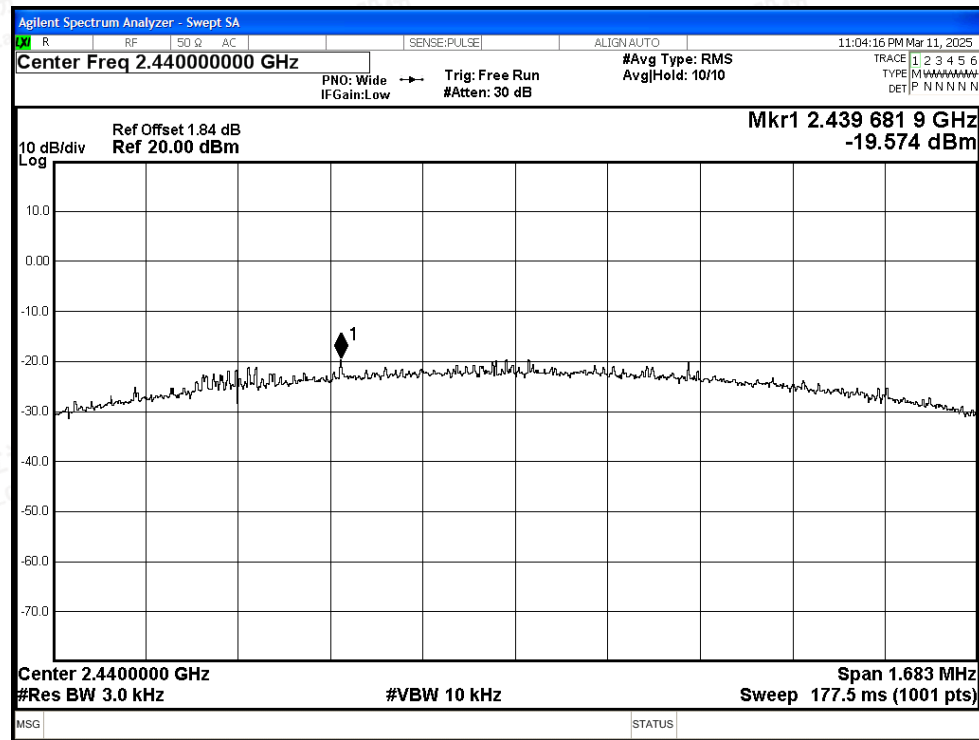


## PSD NVNT BLE 2M 2402MHz Ant1

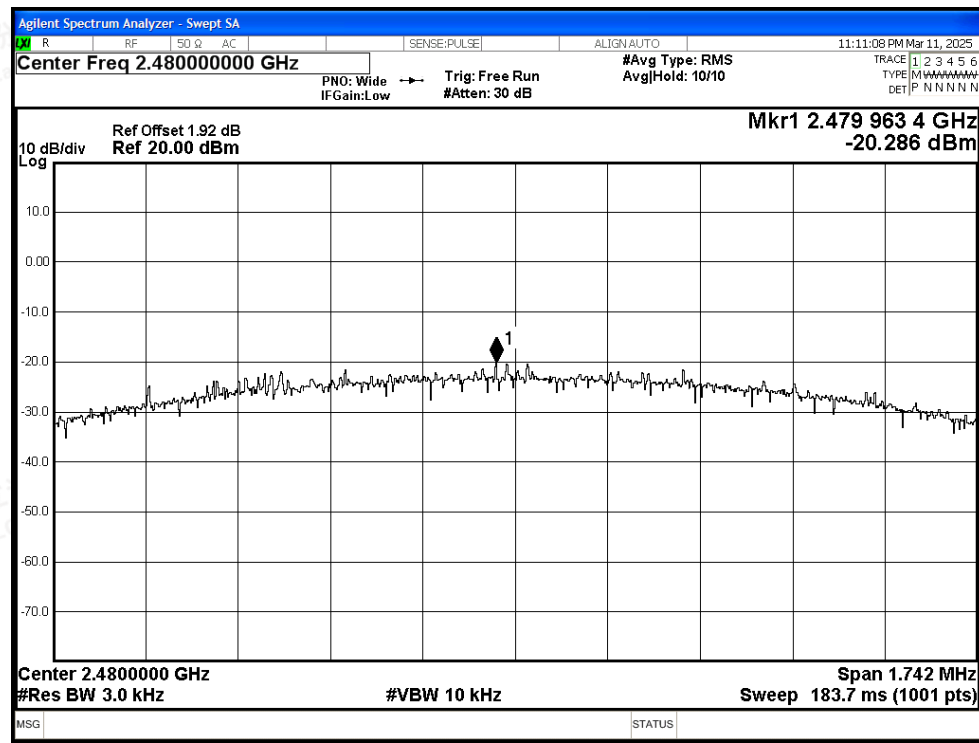




PSD NVNT BLE 2M 2440MHz Ant1



PSD NVNT BLE 2M 2480MHz Ant1





## B.4 Band Edge

| Condition | Mode   | Frequency (MHz) | Antenna | Max Value (dBc) | Limit (dBc) | Verdict |
|-----------|--------|-----------------|---------|-----------------|-------------|---------|
| NVNT      | BLE 1M | 2402            | Ant1    | -58.57          | -20         | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | -56.61          | -20         | Pass    |
| NVNT      | BLE 2M | 2402            | Ant1    | -45.03          | -20         | Pass    |
| NVNT      | BLE 2M | 2480            | Ant1    | -53.9           | -20         | Pass    |

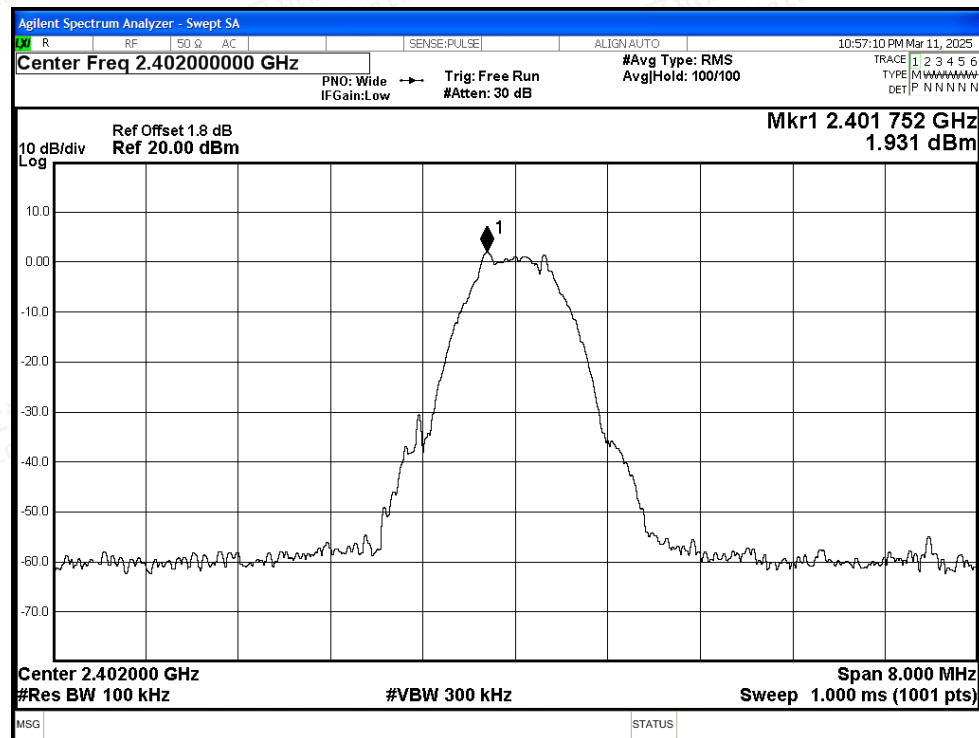


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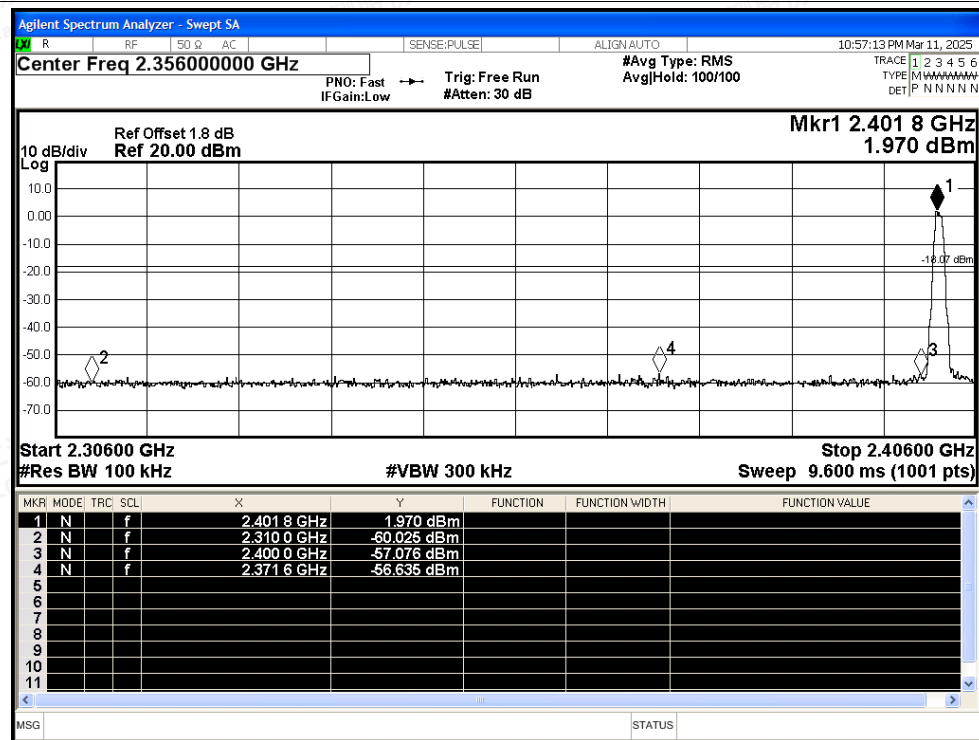


## Test Graphs

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

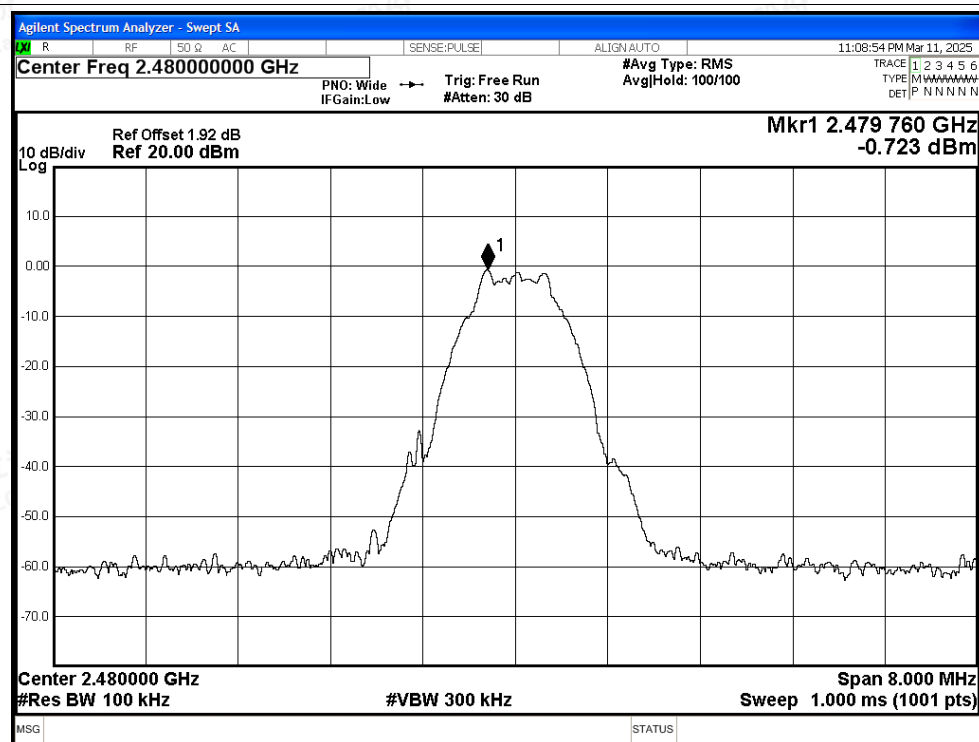


## Band Edge NVNT BLE 1M 2402MHz Ant1 Emission

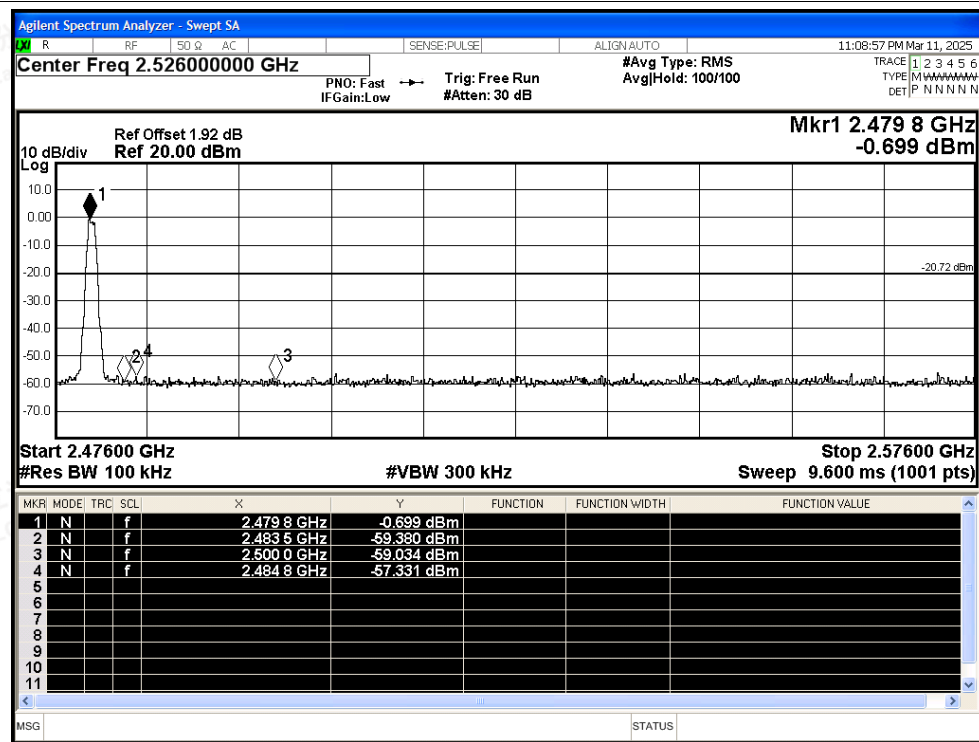


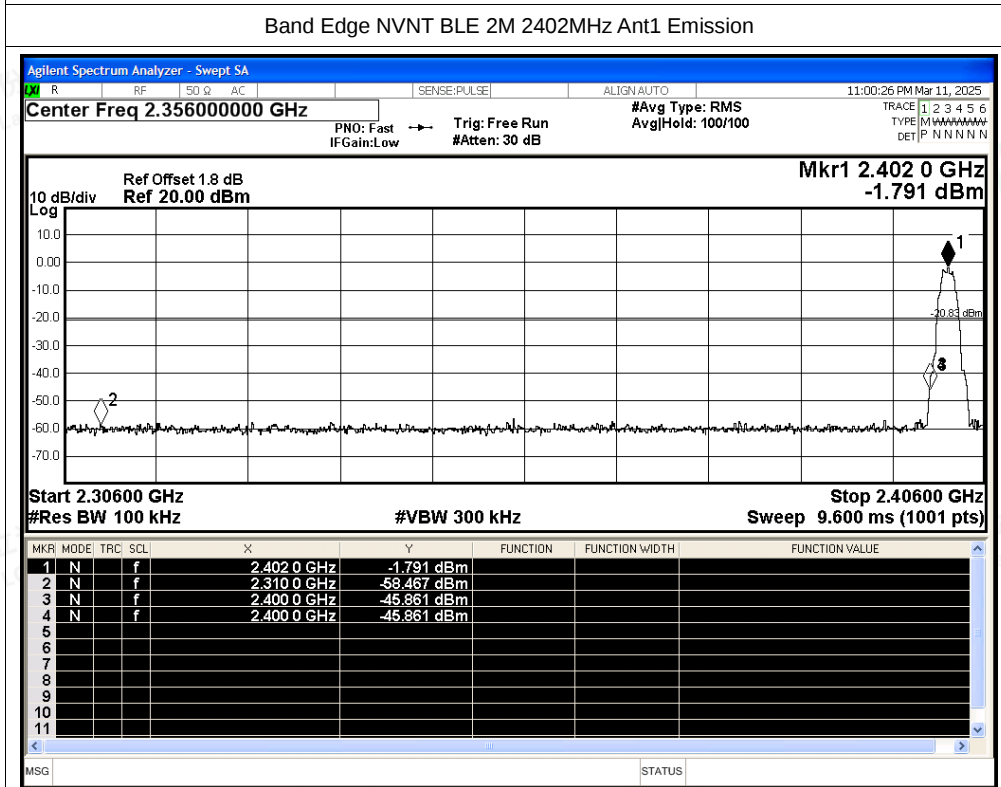
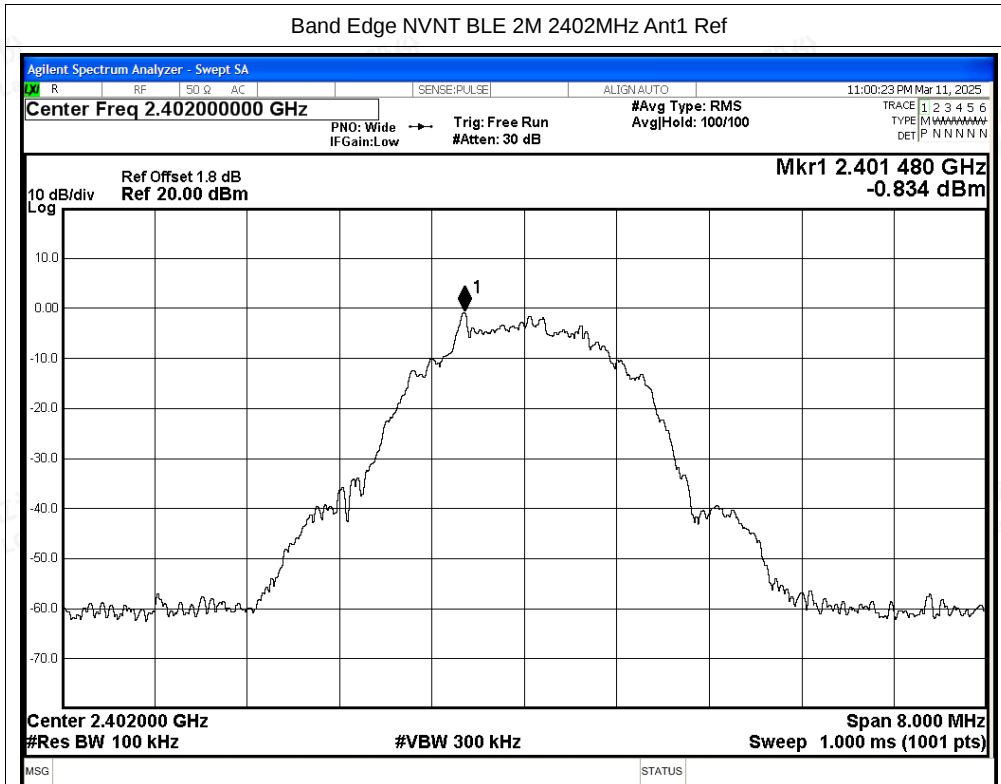


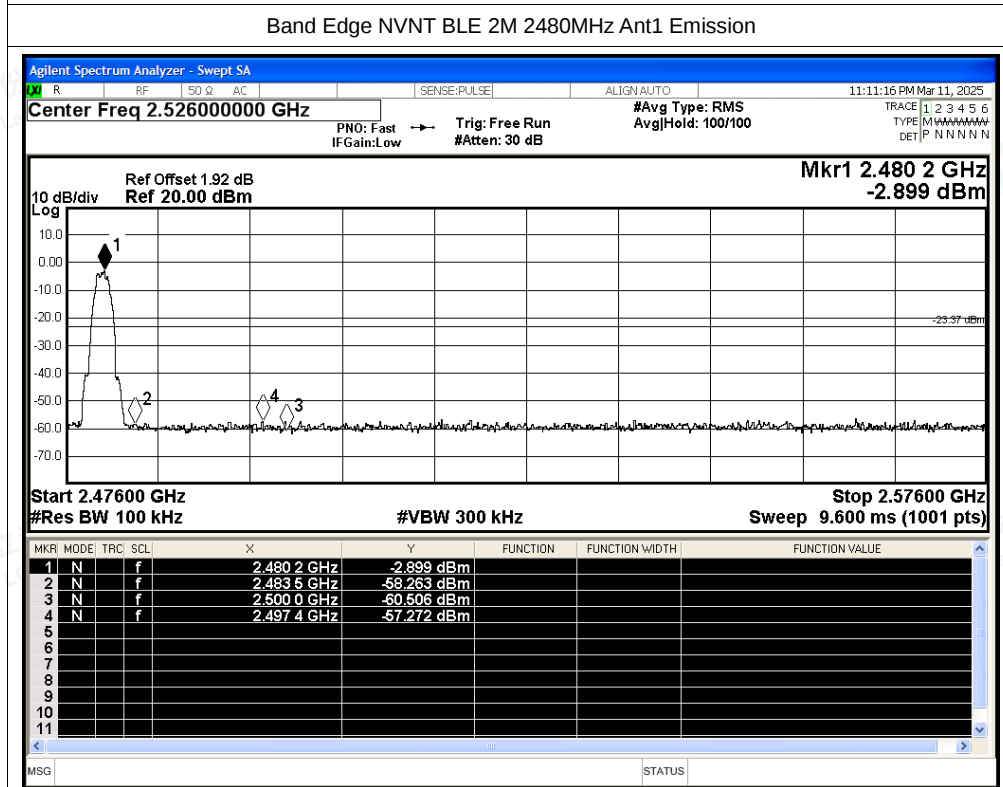
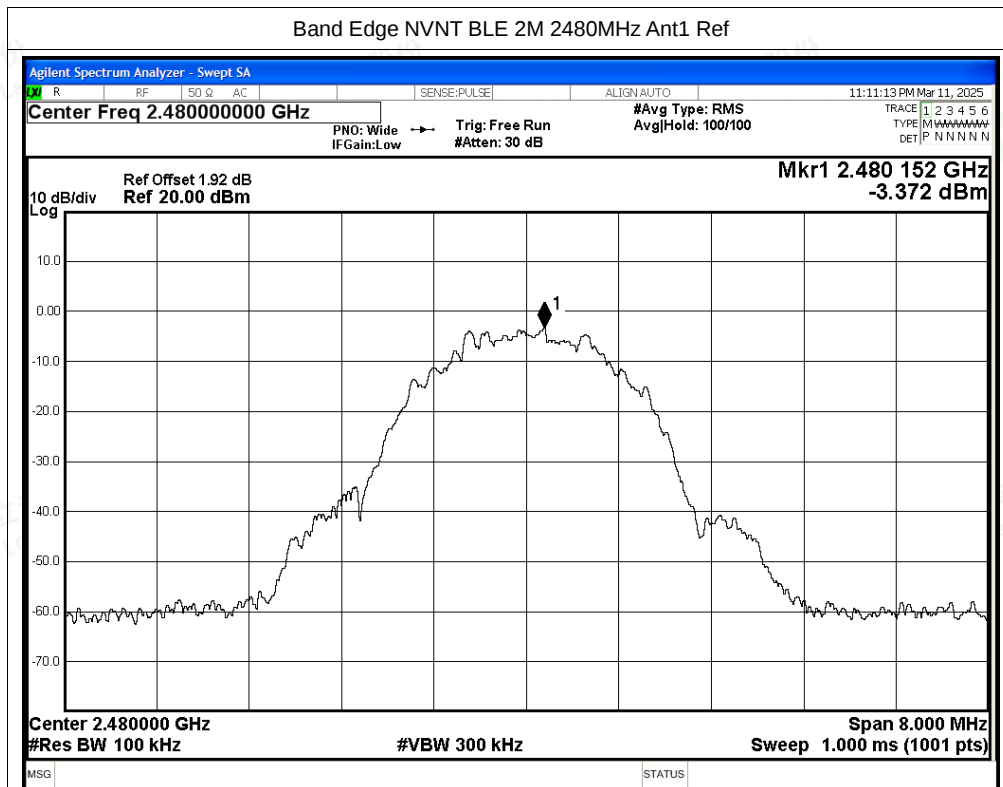
## Band Edge NVNT BLE 1M 2480MHz Ant1 Ref



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









## B.5 Conducted RF Spurious Emission

| Condition | Mode   | Frequency (MHz) | Antenna | Max Value (dBc) | Limit (dBc) | Verdict |
|-----------|--------|-----------------|---------|-----------------|-------------|---------|
| NVNT      | BLE 1M | 2402            | Ant1    | -57.35          | -20         | Pass    |
| NVNT      | BLE 1M | 2440            | Ant1    | -55.58          | -20         | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | -54.8           | -20         | Pass    |
| NVNT      | BLE 2M | 2402            | Ant1    | -54.42          | -20         | Pass    |
| NVNT      | BLE 2M | 2440            | Ant1    | -55.24          | -20         | Pass    |
| NVNT      | BLE 2M | 2480            | Ant1    | -54.01          | -20         | Pass    |

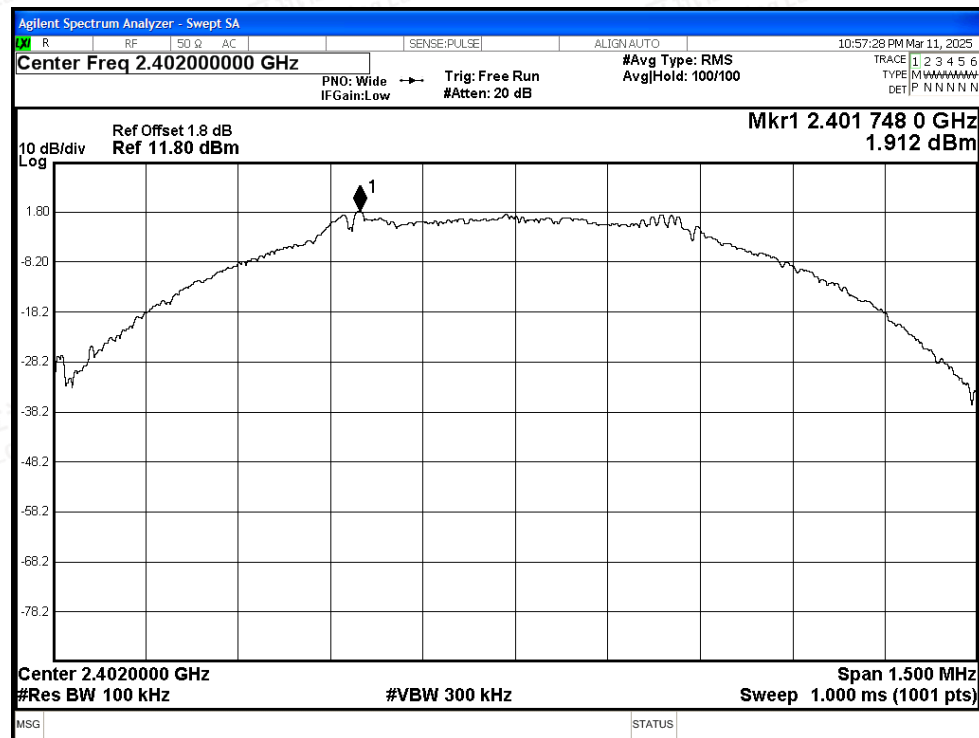


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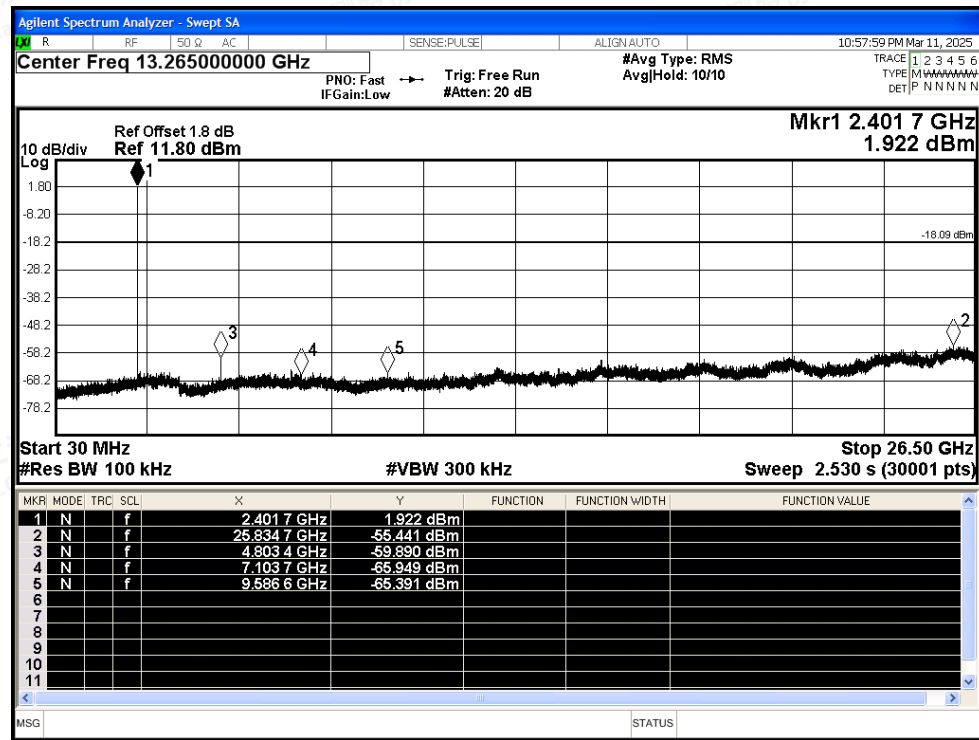


## Test Graphs

Tx. Spurious NVNT BLE 1M 2402MHz Ant1 Ref

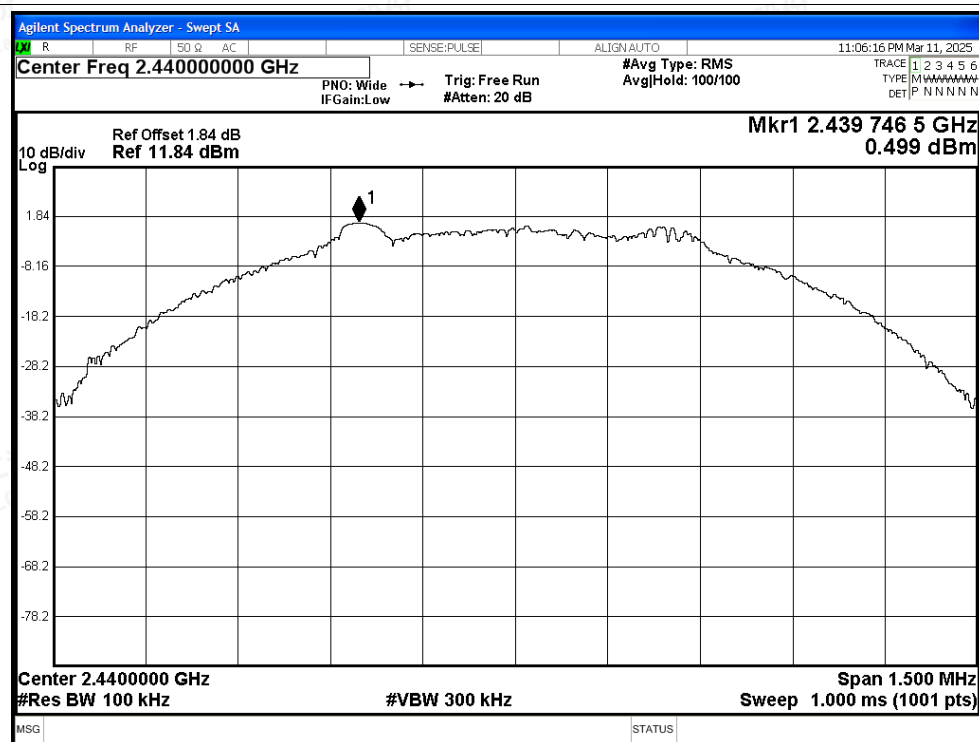


Tx. Spurious NVNT BLE 1M 2402MHz Ant1 Emission

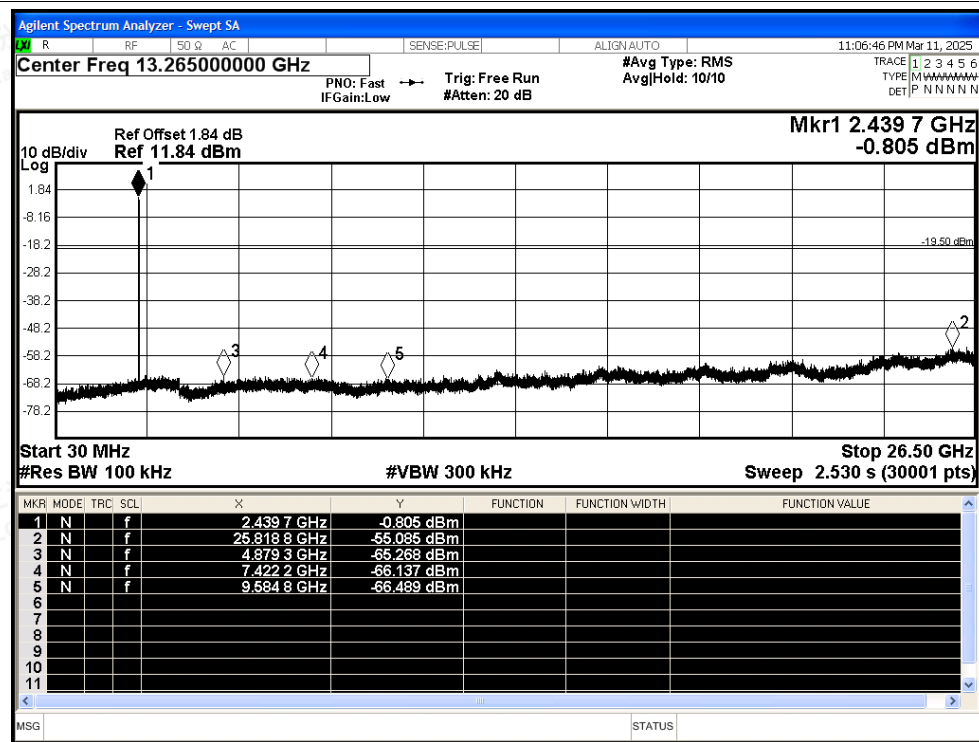




## Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Ref

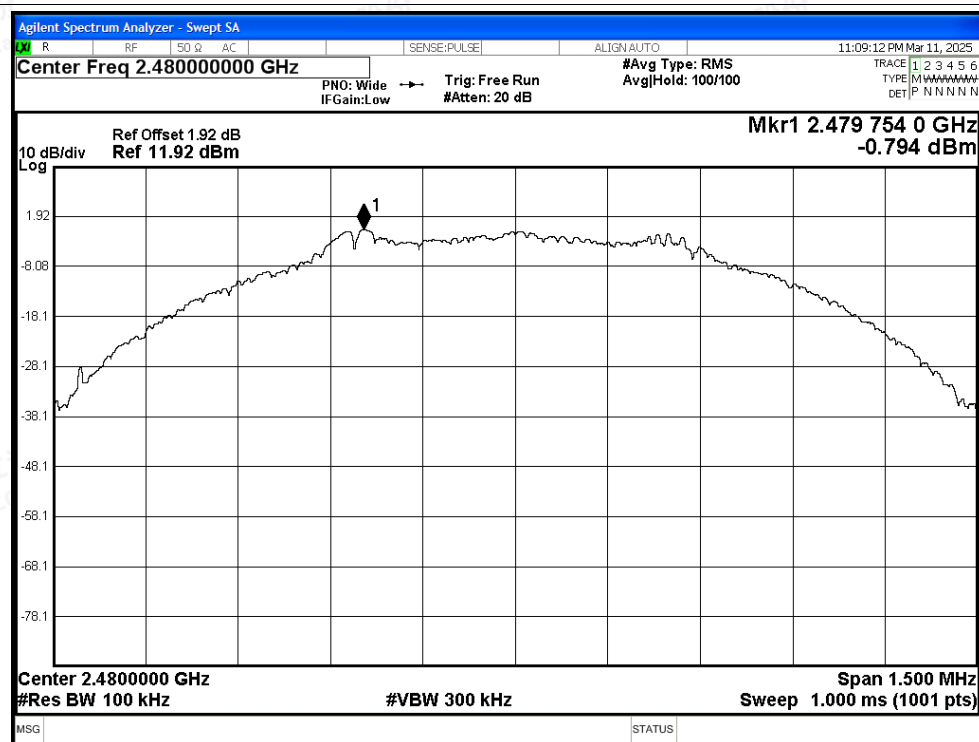


## Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Emission

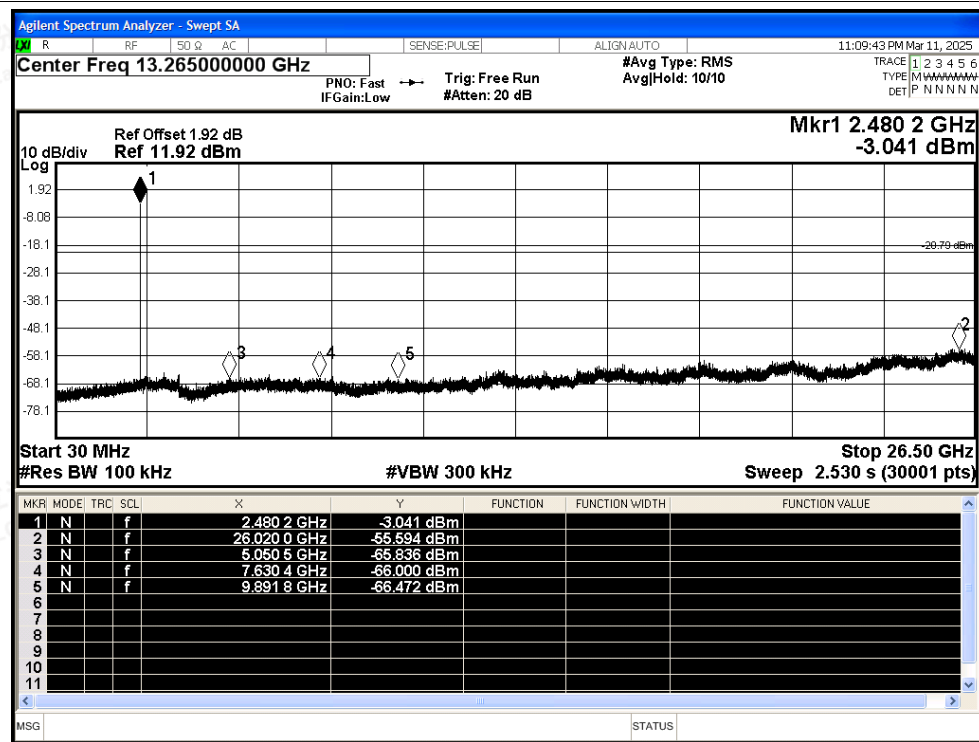




## Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Ref

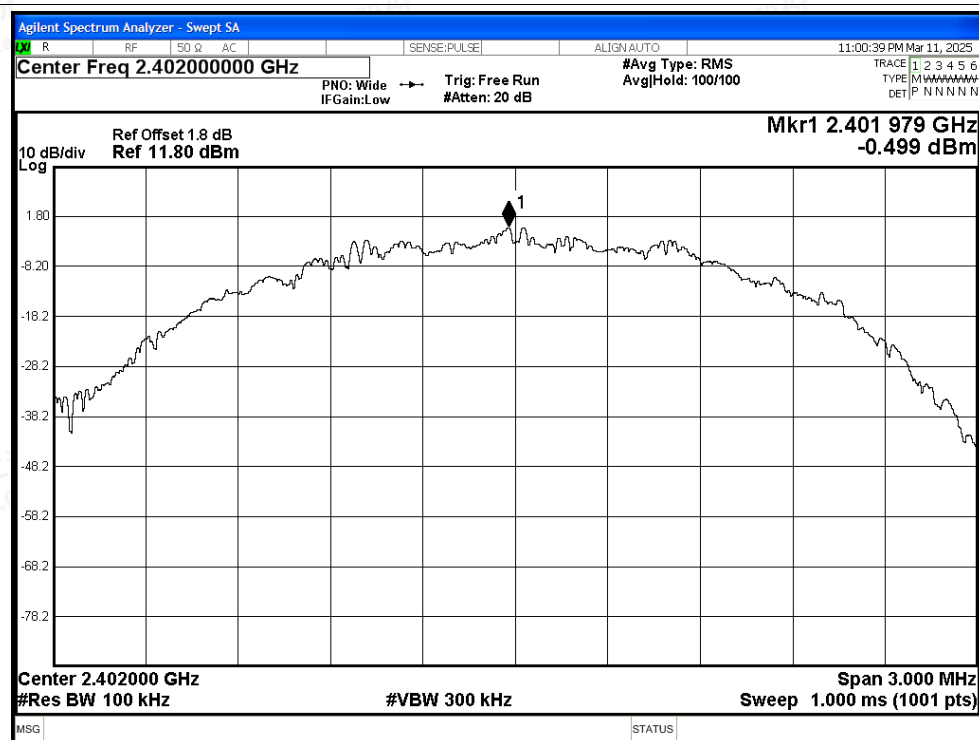


## Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Emission

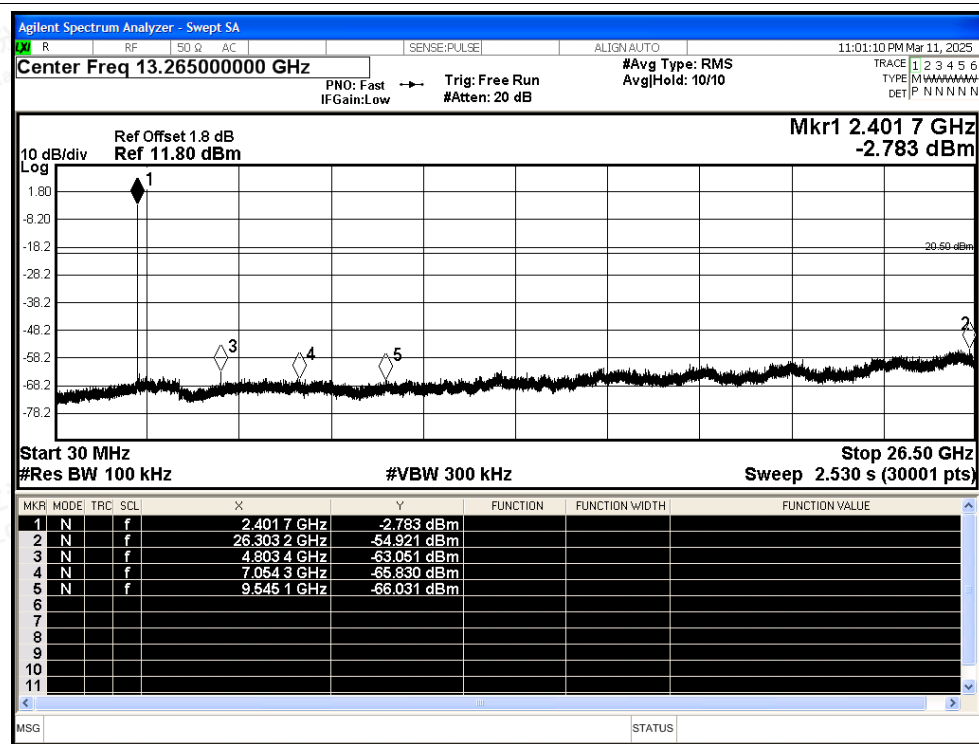




## Tx. Spurious NVNT BLE 2M 2402MHz Ant1 Ref

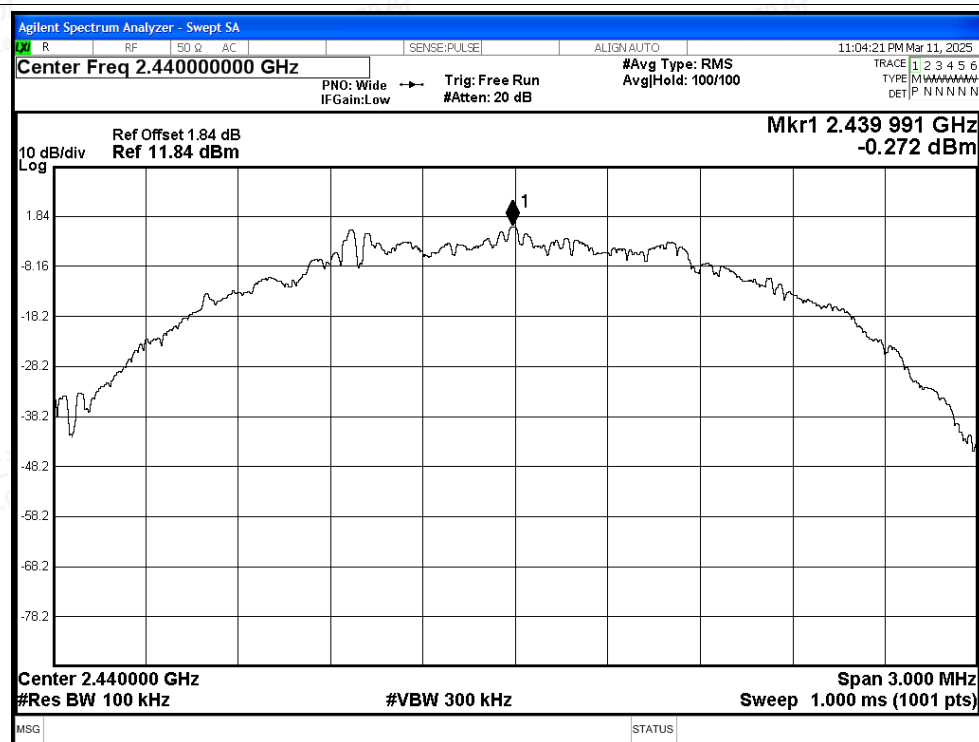


## Tx. Spurious NVNT BLE 2M 2402MHz Ant1 Emission

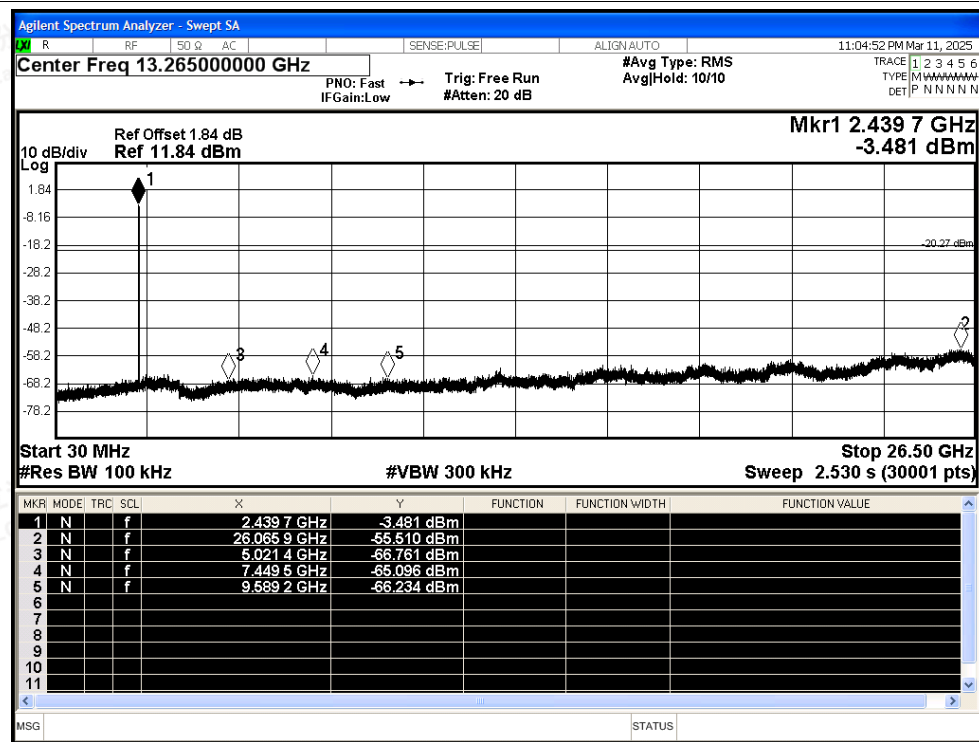




## Tx. Spurious NVNT BLE 2M 2440MHz Ant1 Ref

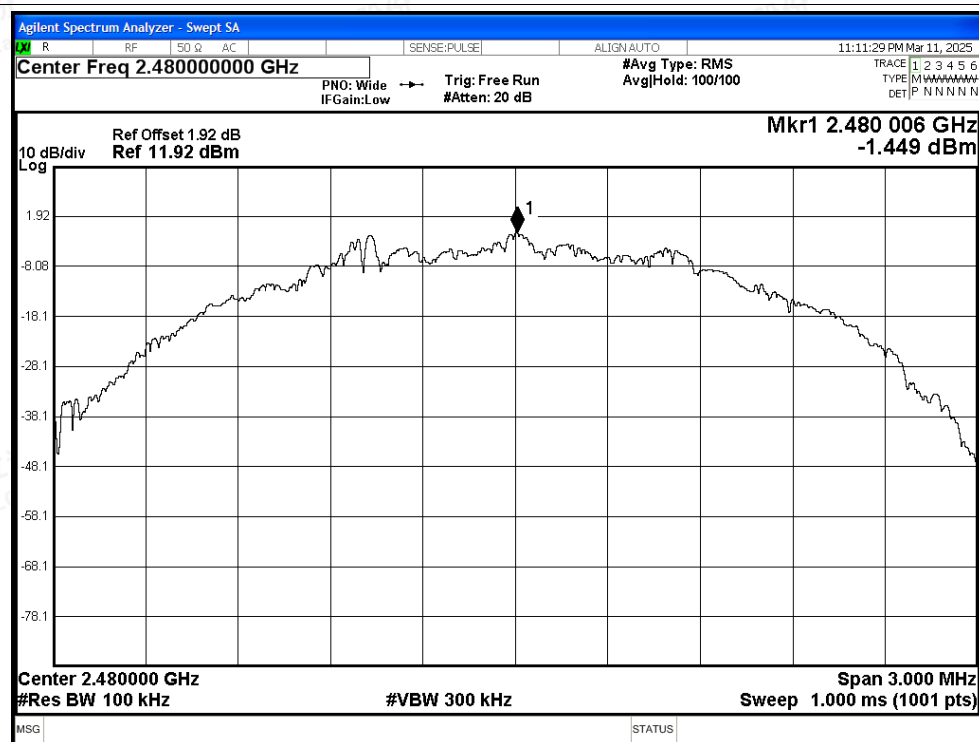


## Tx. Spurious NVNT BLE 2M 2440MHz Ant1 Emission

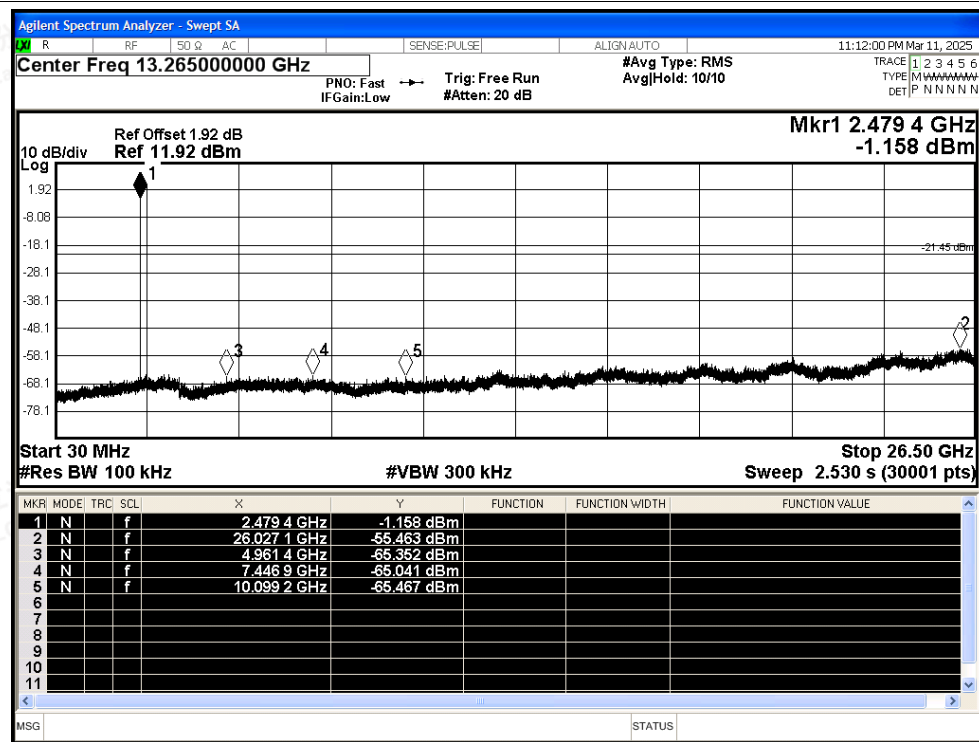




## Tx. Spurious NVNT BLE 2M 2480MHz Ant1 Ref



## Tx. Spurious NVNT BLE 2M 2480MHz Ant1 Emission





## B.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      |
| NVNT      | BLE 2M | 2402            | Ant1    | 65.93          | 1.81                   | 1.21      |
| NVNT      | BLE 2M | 2440            | Ant1    | 65.96          | 1.81                   | 1.21      |
| NVNT      | BLE 2M | 2480            | Ant1    | 65.92          | 1.81                   | 1.21      |

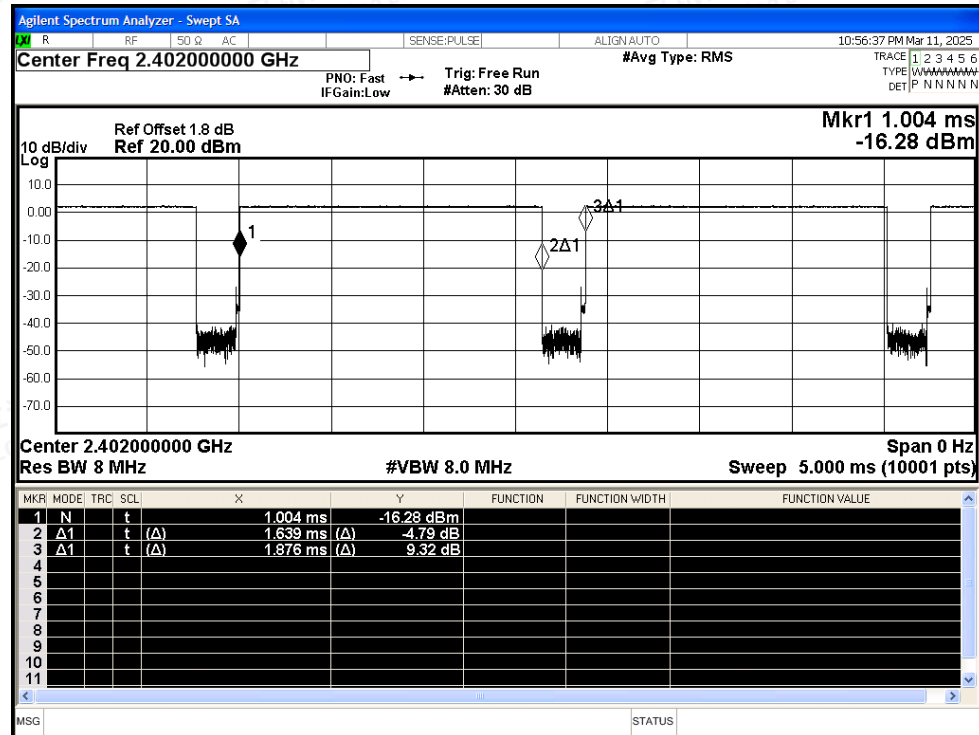


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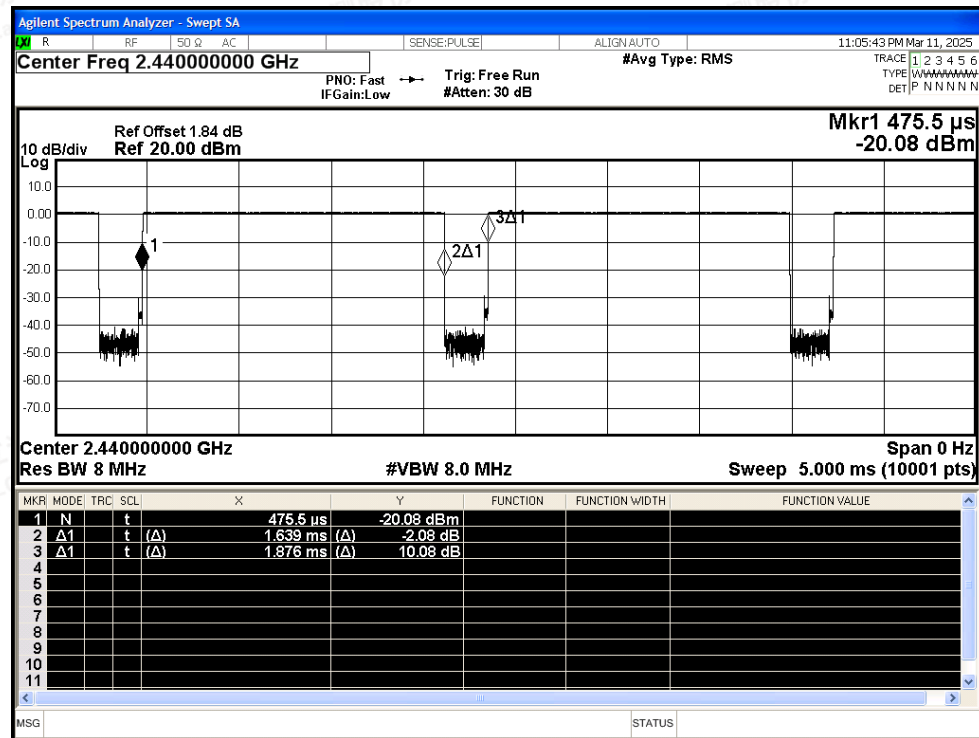


## Test Graphs

## Duty Cycle NVNT BLE 1M 2402MHz Ant1



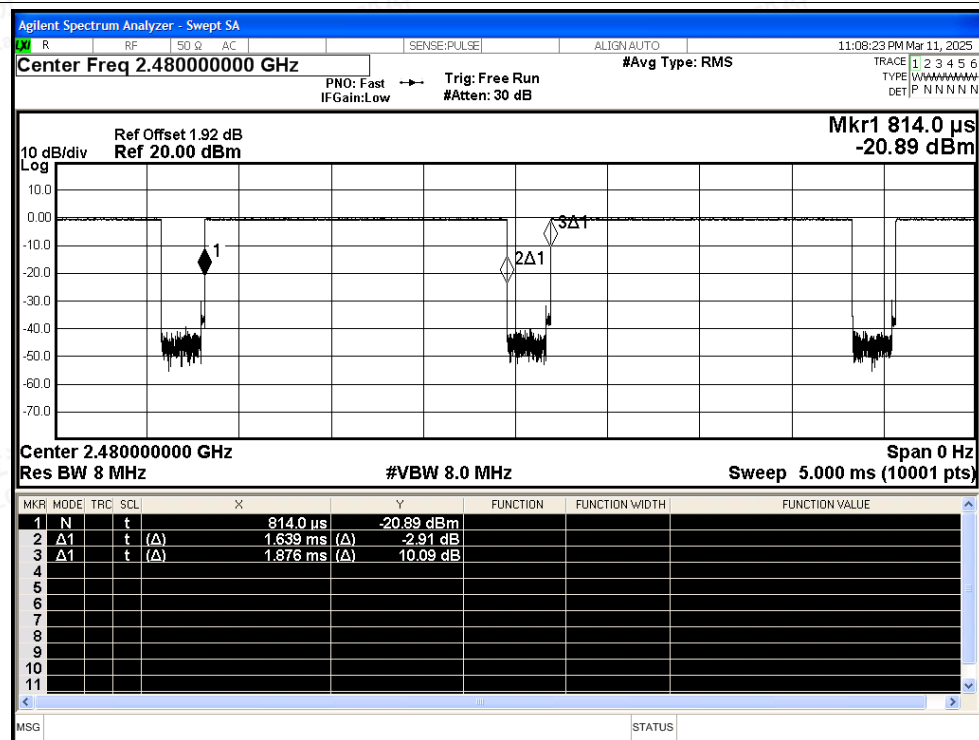
## Duty Cycle NVNT BLE 1M 2440MHz Ant1



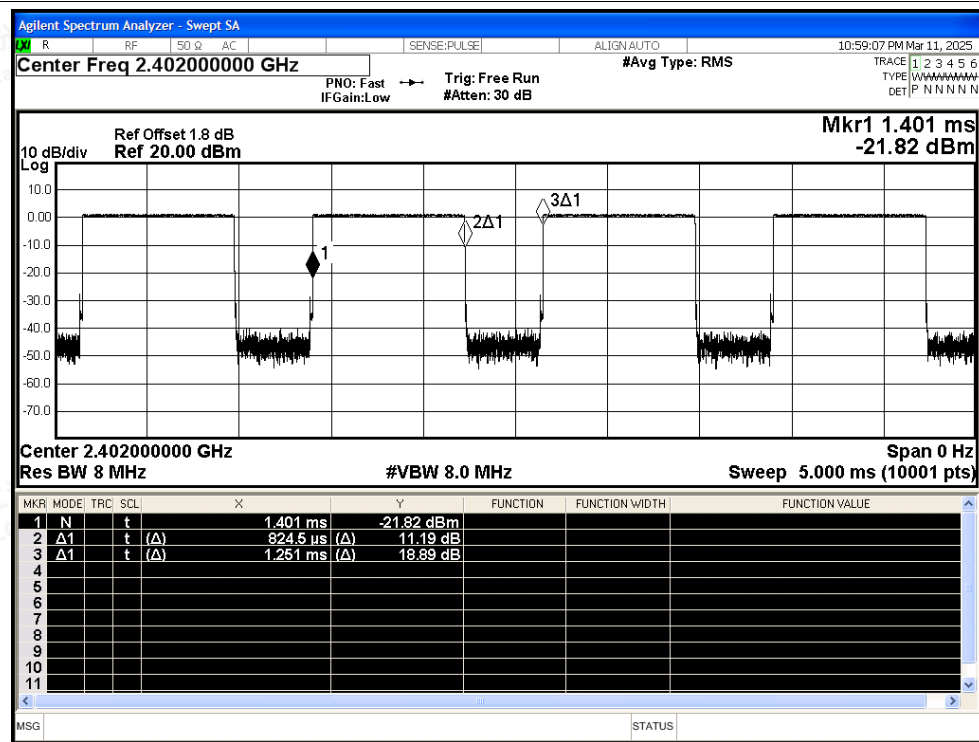
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## Duty Cycle NVNT BLE 1M 2480MHz Ant1

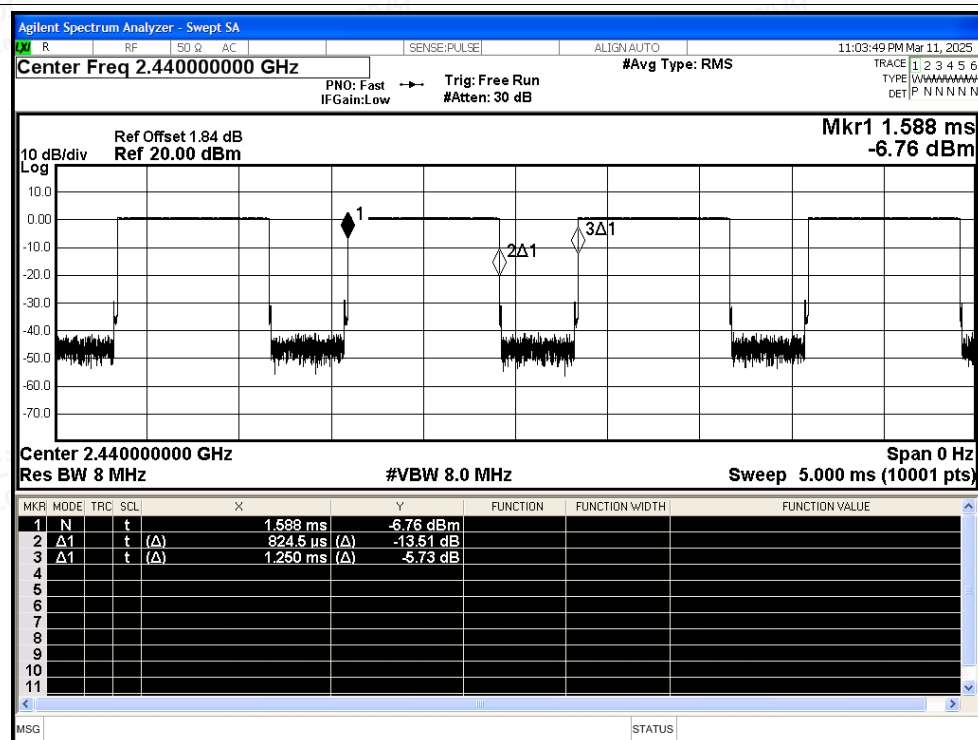


## Duty Cycle NVNT BLE 2M 2402MHz Ant1

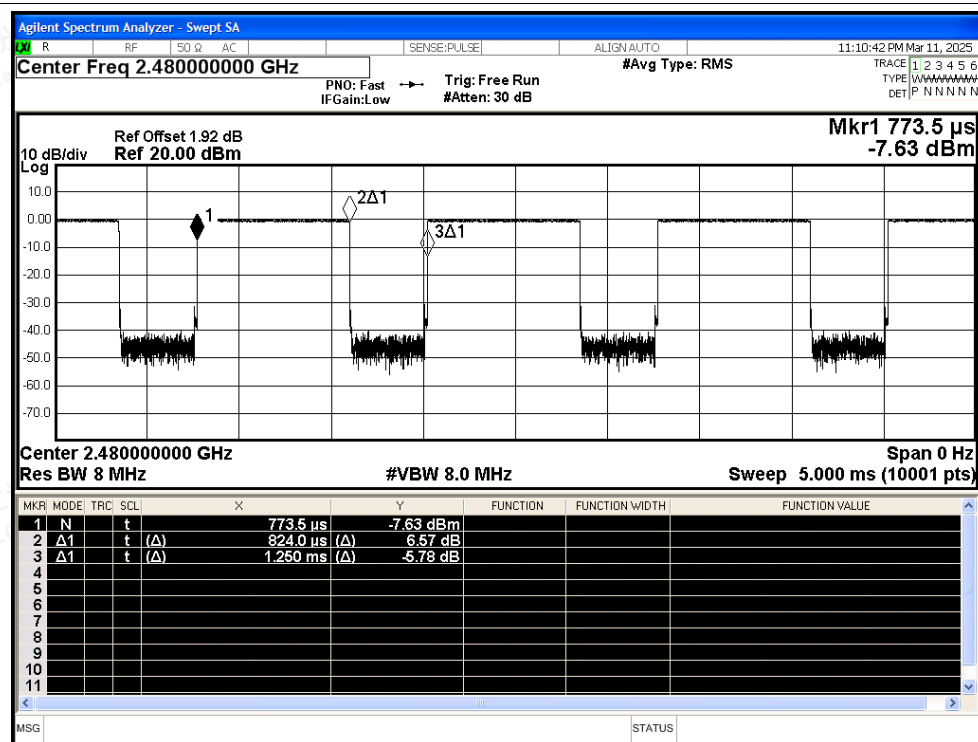




## Duty Cycle NVNT BLE 2M 2440MHz Ant1



## Duty Cycle NVNT BLE 2M 2480MHz Ant1





## B.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            | -51.91      | 2.00       | -                | 45.35      | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2402            | Ant1    | 2310            | -58.92      | 2.00       | 0.59             | 38.93      | Average  | 54             | Pass    |
| NVNT      | BLE 1M | 2402            | Ant1    | 2331.792        | -47.8       | 2.00       | -                | 49.46      | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2402            | Ant1    | 2389.392        | -58.3       | 2.00       | 0.59             | 39.55      | Average  | 54             | Pass    |
| NVNT      | BLE 1M | 2402            | Ant1    | 2390            | -50.41      | 2.00       | -                | 46.85      | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2402            | Ant1    | 2390            | -58.45      | 2.00       | 0.59             | 39.40      | Average  | 54             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2483.5          | -48.64      | 2.00       | -                | 48.62      | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2483.5          | -57.81      | 2.00       | 0.59             | 40.04      | Average  | 54             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2488.12         | -43.39      | 2.00       | -                | 53.87      | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2483.896        | -57.54      | 2.00       | 0.59             | 40.31      | Average  | 54             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2500            | -49.7       | 2.00       | -                | 47.56      | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2500            | -58.31      | 2.00       | 0.59             | 39.54      | Average  | 54             | Pass    |
| NVNT      | BLE 2M | 2402            | Ant1    | 2310            | -50.02      | 2.00       | -                | 47.24      | Peak     | 74             | Pass    |
| NVNT      | BLE 2M | 2402            | Ant1    | 2310            | -59.53      | 2.00       | 0                | 37.73      | Average  | 54             | Pass    |
| NVNT      | BLE 2M | 2402            | Ant1    | 2367.6          | -47.71      | 2.00       | -                | 49.55      | Peak     | 74             | Pass    |
| NVNT      | BLE 2M | 2402            | Ant1    | 2378.256        | -57.84      | 2.00       | 0                | 39.42      | Average  | 54             | Pass    |
| NVNT      | BLE 2M | 2402            | Ant1    | 2390            | -51.79      | 2.00       | -                | 45.47      | Peak     | 74             | Pass    |
| NVNT      | BLE 2M | 2402            | Ant1    | 2390            | -58.84      | 2.00       | 0                | 38.42      | Average  | 54             | Pass    |
| NVNT      | BLE 2M | 2480            | Ant1    | 2483.5          | -49.17      | 2.00       | -                | 48.09      | Peak     | 74             | Pass    |
| NVNT      | BLE 2M | 2480            | Ant1    | 2483.5          | -57.69      | 2.00       | 1.81             | 41.38      | Average  | 54             | Pass    |
| NVNT      | BLE 2M | 2480            | Ant1    | 2484.88         | -44.19      | 2.00       | -                | 53.07      | Peak     | 74             | Pass    |
| NVNT      | BLE 2M | 2480            | Ant1    | 2484.208        | -56.95      | 2.00       | 1.81             | 42.12      | Average  | 54             | Pass    |
| NVNT      | BLE 2M | 2480            | Ant1    | 2500            | -50.59      | 2.00       | -                | 46.67      | Peak     | 74             | Pass    |
| NVNT      | BLE 2M | 2480            | Ant1    | 2500            | -58.12      | 2.00       | 1.81             | 40.95      | Average  | 54             | Pass    |

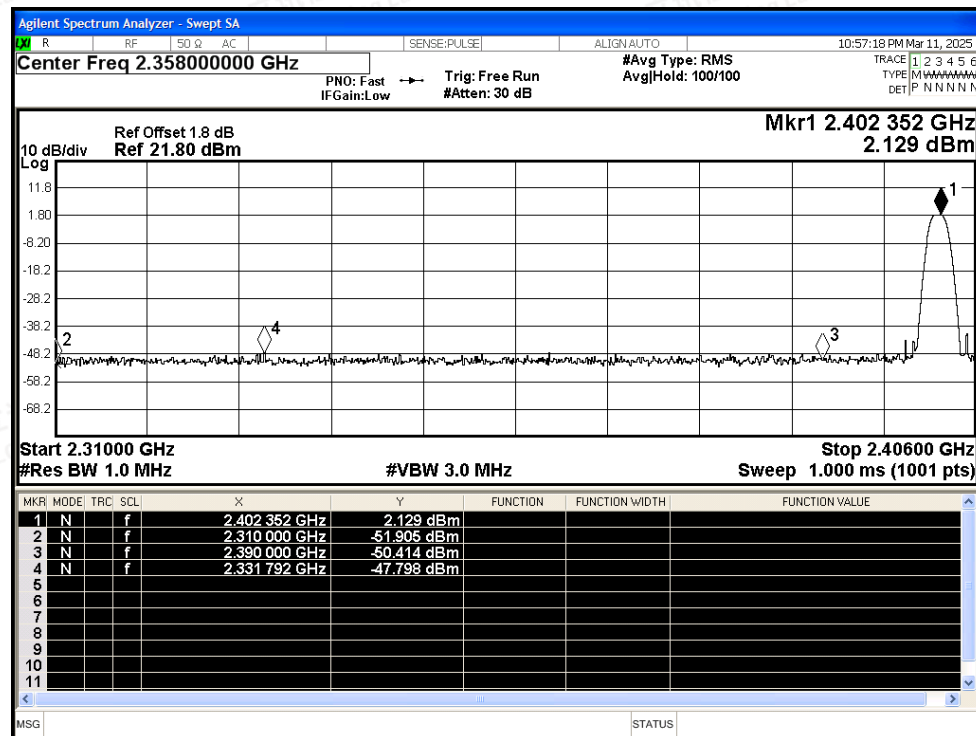


Shenzhen LCS Compliance Testing Laboratory Ltd.  
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street,  
Baoan District, Shenzhen, 518000, China  
Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com  
Scan code to check authenticity

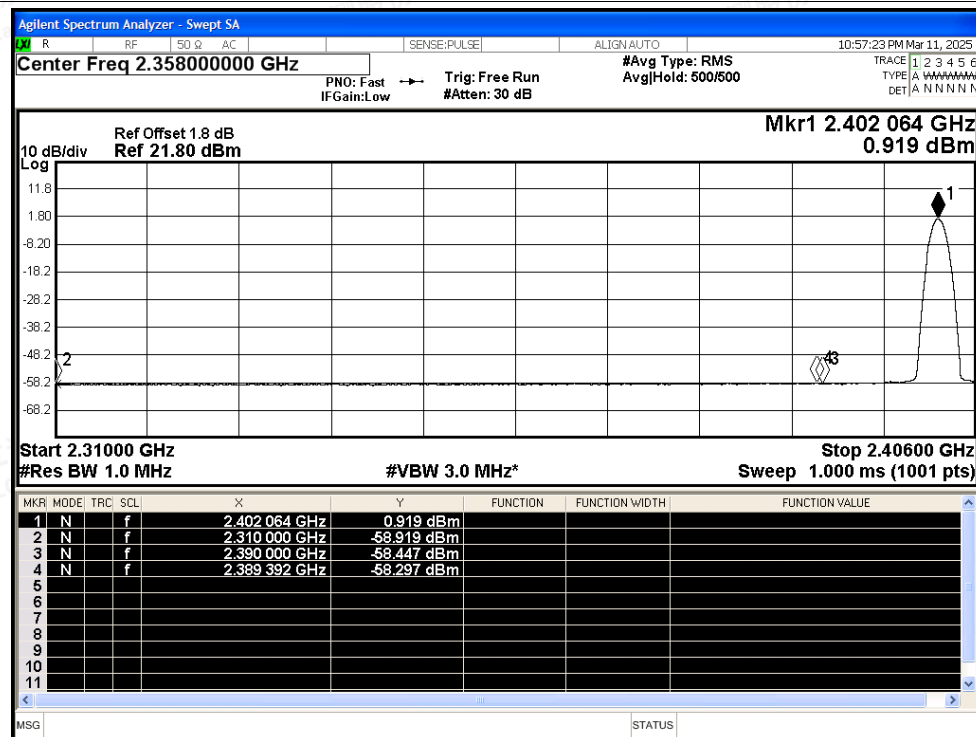


## Test Graphs

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



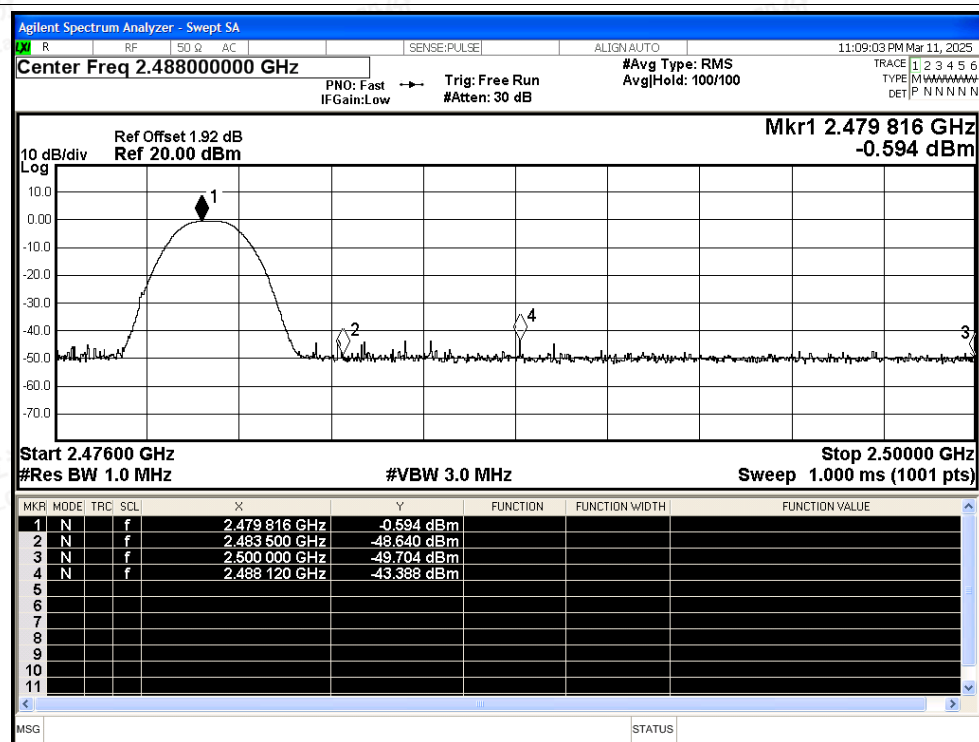
## Restrict Band NVNT BLE 1M 2402MHz Ant1 Average



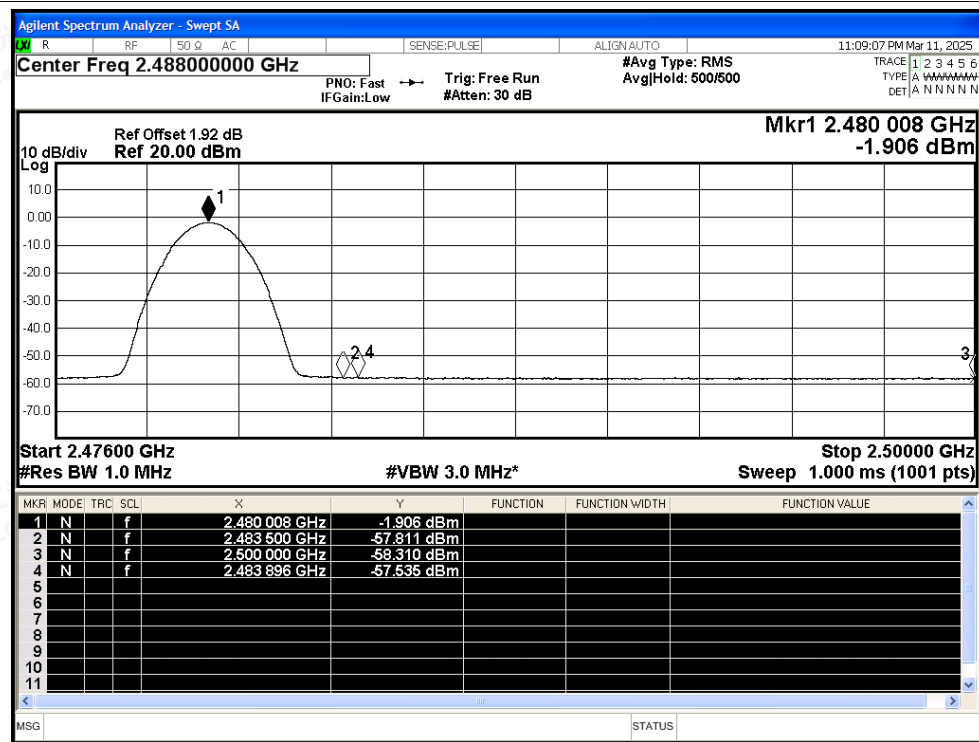
Shenzhen LCS Compliance Testing Laboratory Ltd.  
Add: 101, 201 Bldg A & 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street,  
Baoan District, Shenzhen, 518000, China  
Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com  
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## Restrict Band NVNT BLE 1M 2480MHz Ant1 Peak

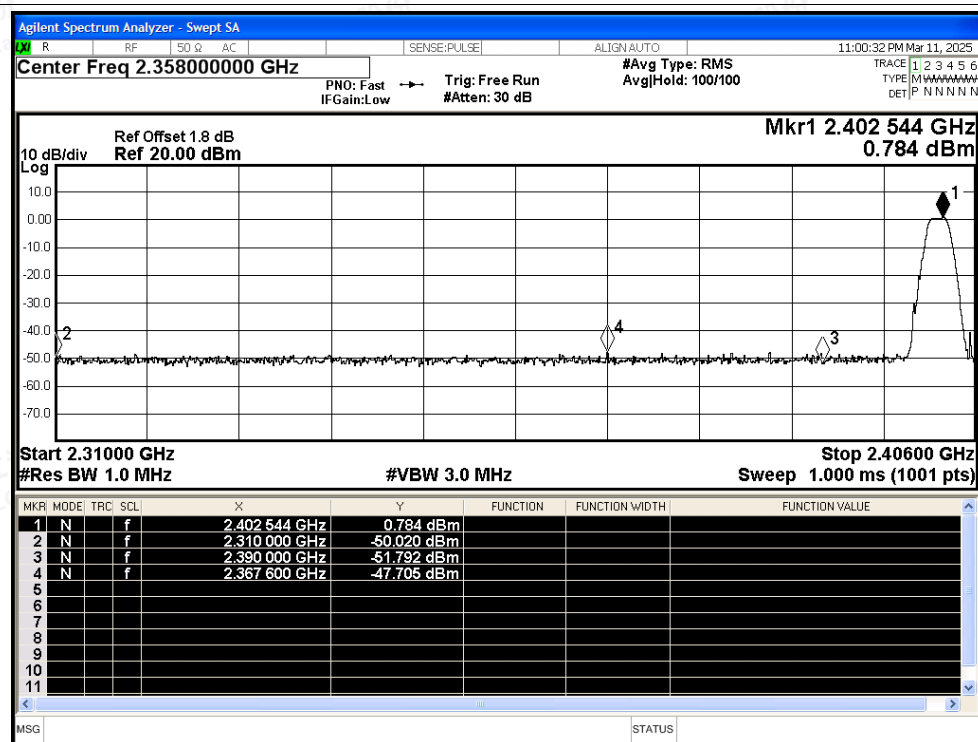


## Restrict Band NVNT BLE 1M 2480MHz Ant1 Average

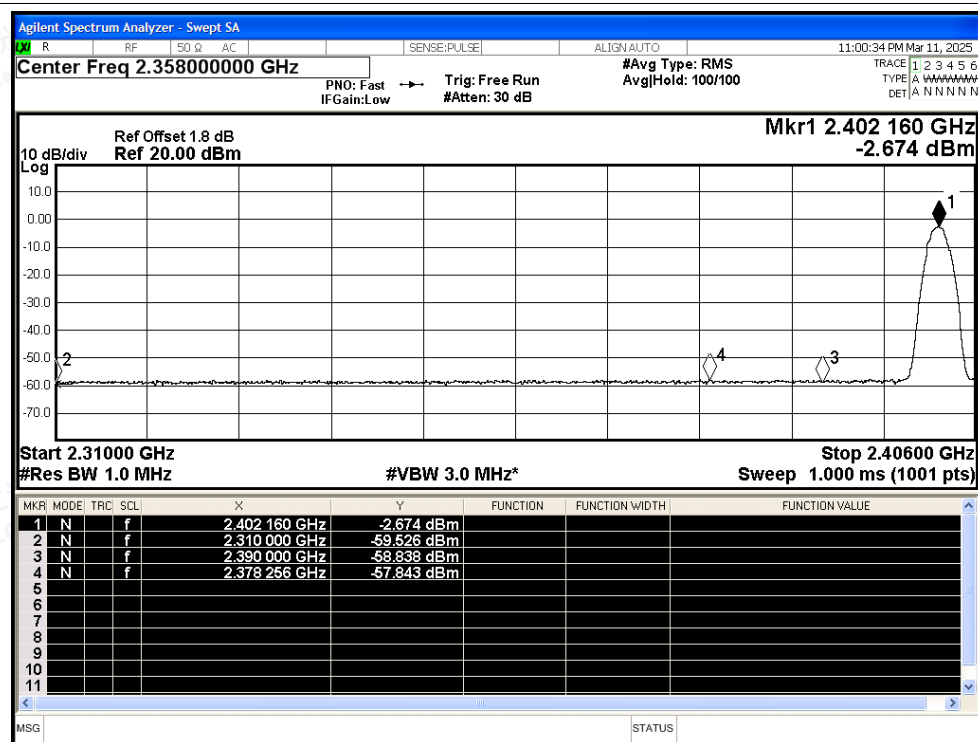




## Restrict Band NVNT BLE 2M 2402MHz Ant1 Peak

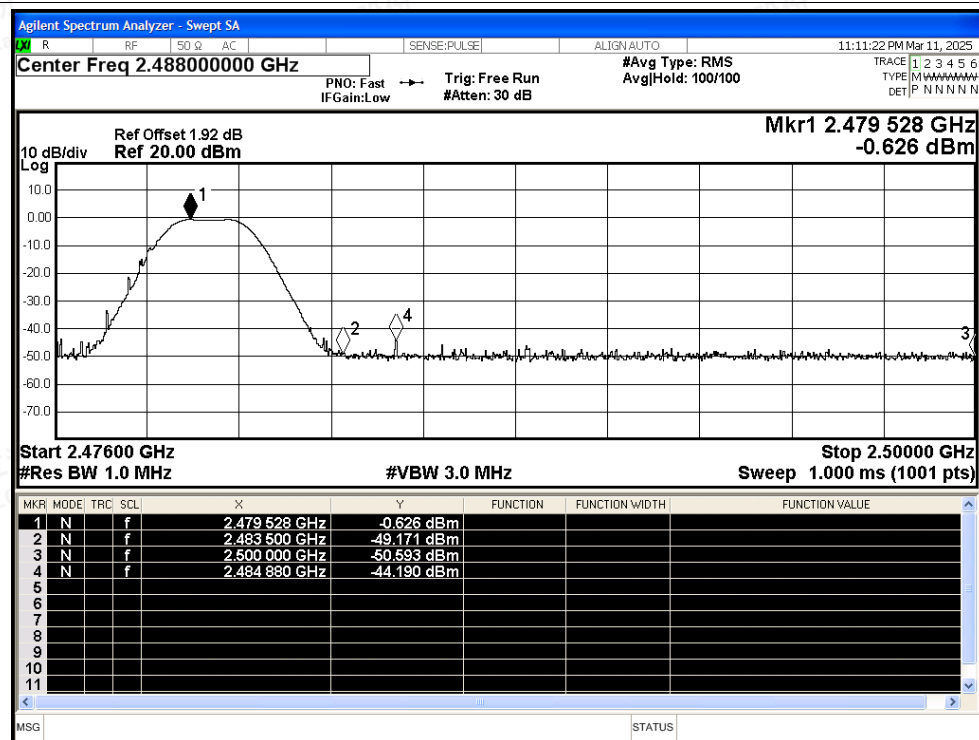


## Restrict Band NVNT BLE 2M 2402MHz Ant1 Average





## Restrict Band NVNT BLE 2M 2480MHz Ant1 Peak



## Restrict Band NVNT BLE 2M 2480MHz Ant1 Average

