



## Appendix B

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

Product Name: Hyundai Mini PC

Test Model: HTN4020MPC

#### Environmental Conditions

|                    |           |
|--------------------|-----------|
| Temperature:       | 23.8° C   |
| Relative Humidity: | 52.2%     |
| ATM Pressure:      | 100.0 kPa |
| Test Engineer:     | Nick Peng |
| Supervised by:     | Li Huan   |





## B.1 -6dB Bandwidth

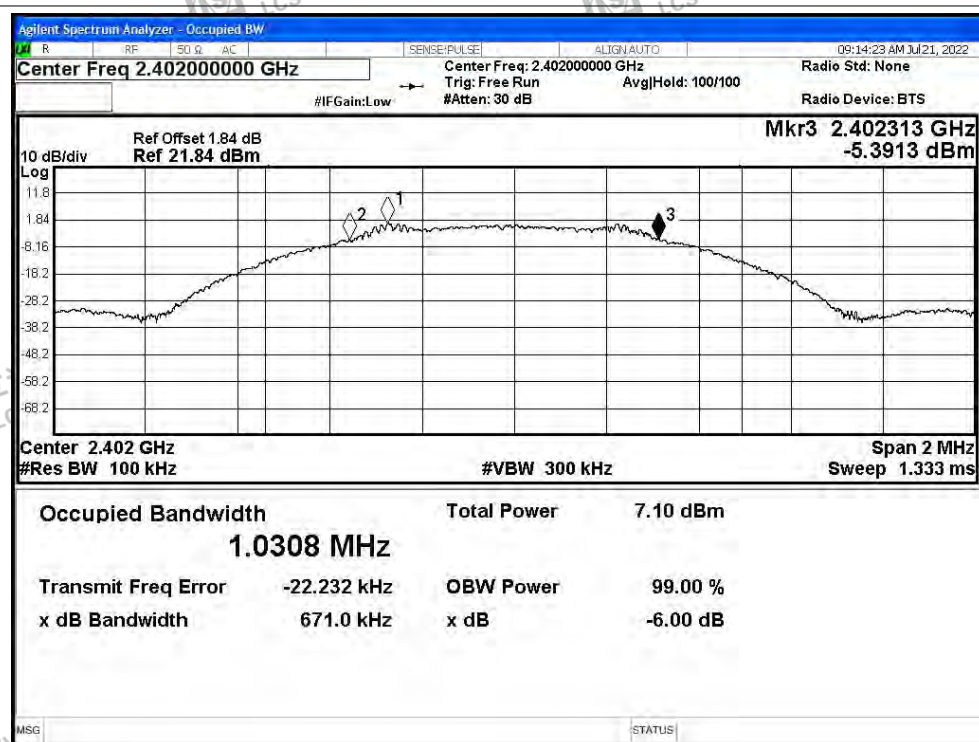
| Condition | Mode   | Frequency (MHz) | Antenna | -6 dB Bandwidth (MHz) | Limit -6 dB Bandwidth (MHz) | Verdict |
|-----------|--------|-----------------|---------|-----------------------|-----------------------------|---------|
| NVNT      | BLE 1M | 2402            | Ant1    | 0.671                 | $\geq 0.5$                  | Pass    |
| NVNT      | BLE 1M | 2440            | Ant1    | 0.707                 | $\geq 0.5$                  | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 0.673                 | $\geq 0.5$                  | Pass    |
| NVNT      | BLE 2M | 2402            | Ant1    | 1.327                 | $\geq 0.5$                  | Pass    |
| NVNT      | BLE 2M | 2440            | Ant1    | 1.277                 | $\geq 0.5$                  | Pass    |
| NVNT      | BLE 2M | 2480            | Ant1    | 1.412                 | $\geq 0.5$                  | Pass    |



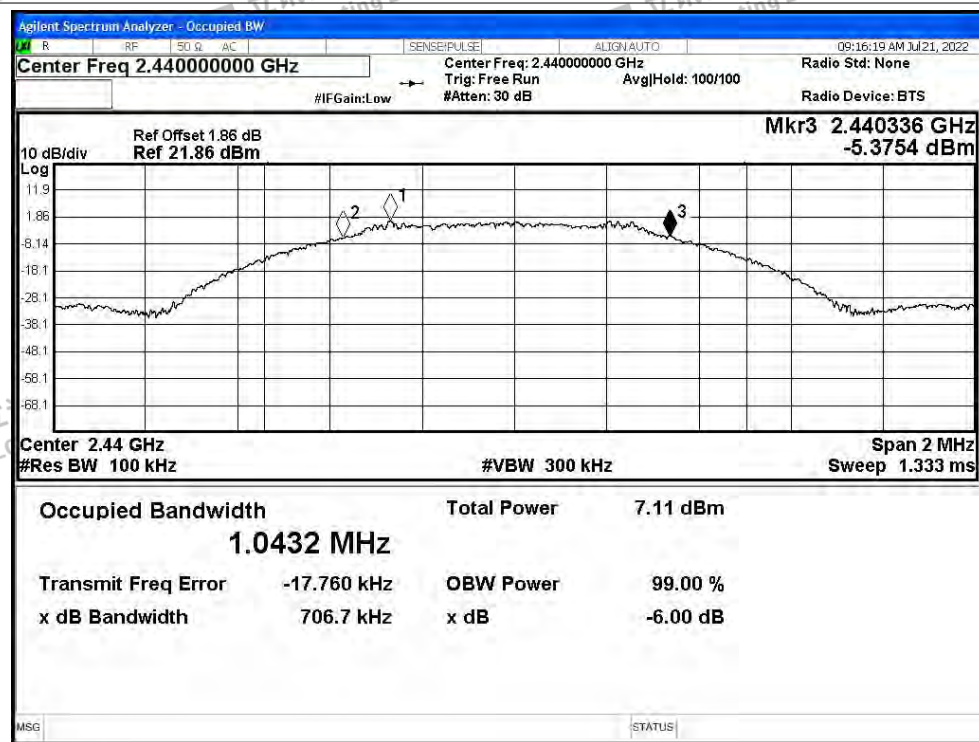


## Test Graphs

-6dB Bandwidth NVNT BLE 1M 2402MHz Ant1



-6dB Bandwidth NVNT BLE 1M 2440MHz Ant1



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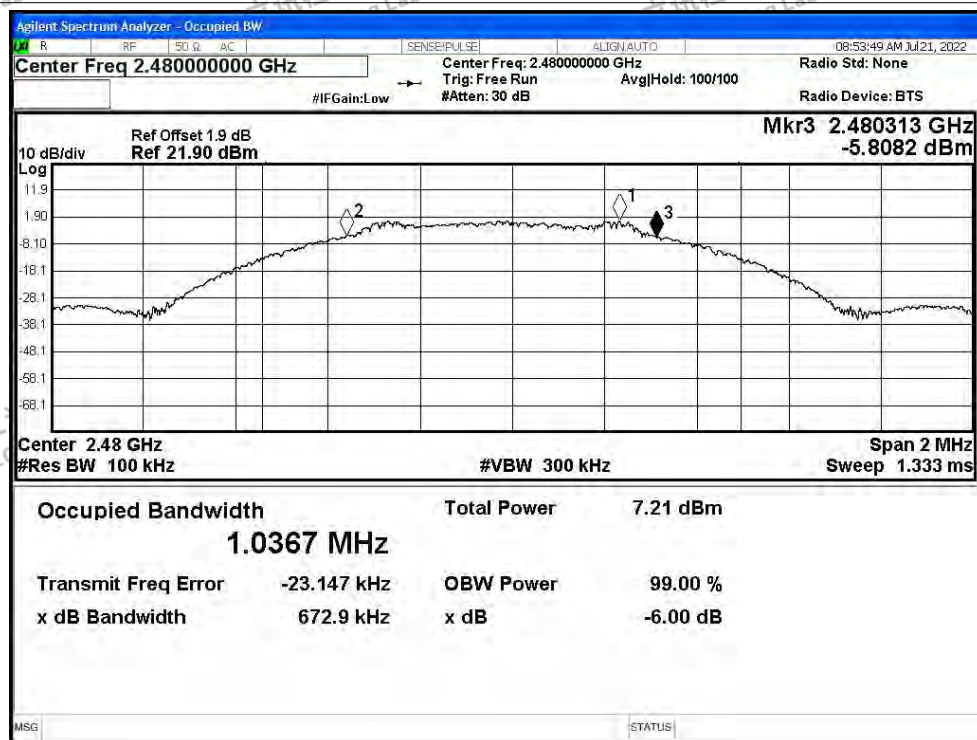
Add: 101, 201 Bldg A &amp; 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

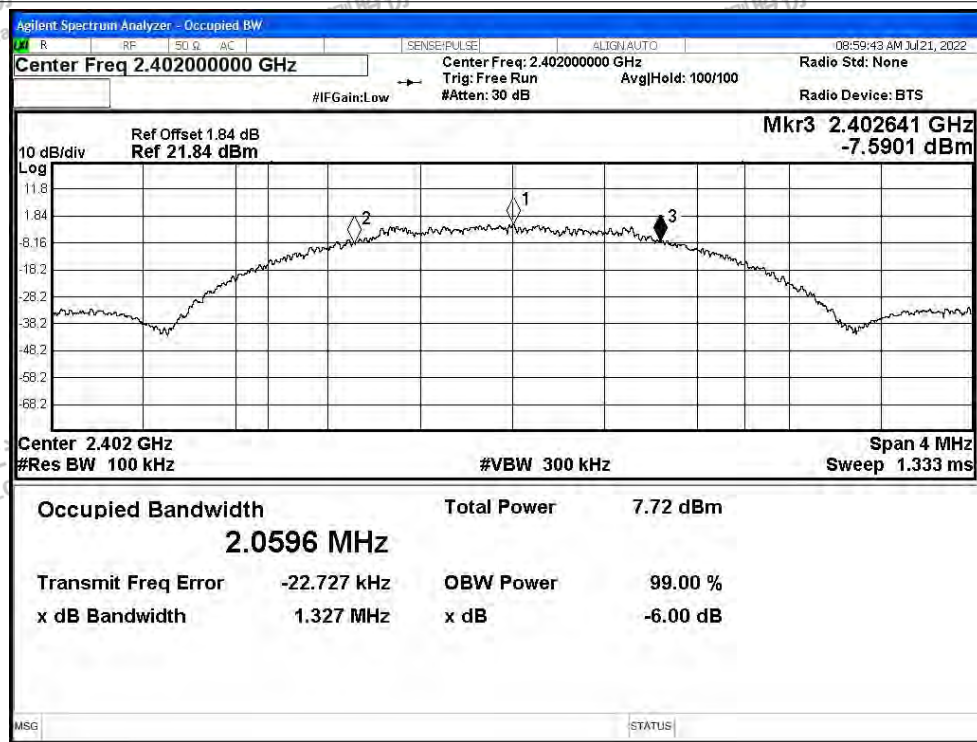
Scan code to check authenticity



-6dB Bandwidth NVNT BLE 1M 2480MHz Ant1



-6dB Bandwidth NVNT BLE 2M 2402MHz Ant1



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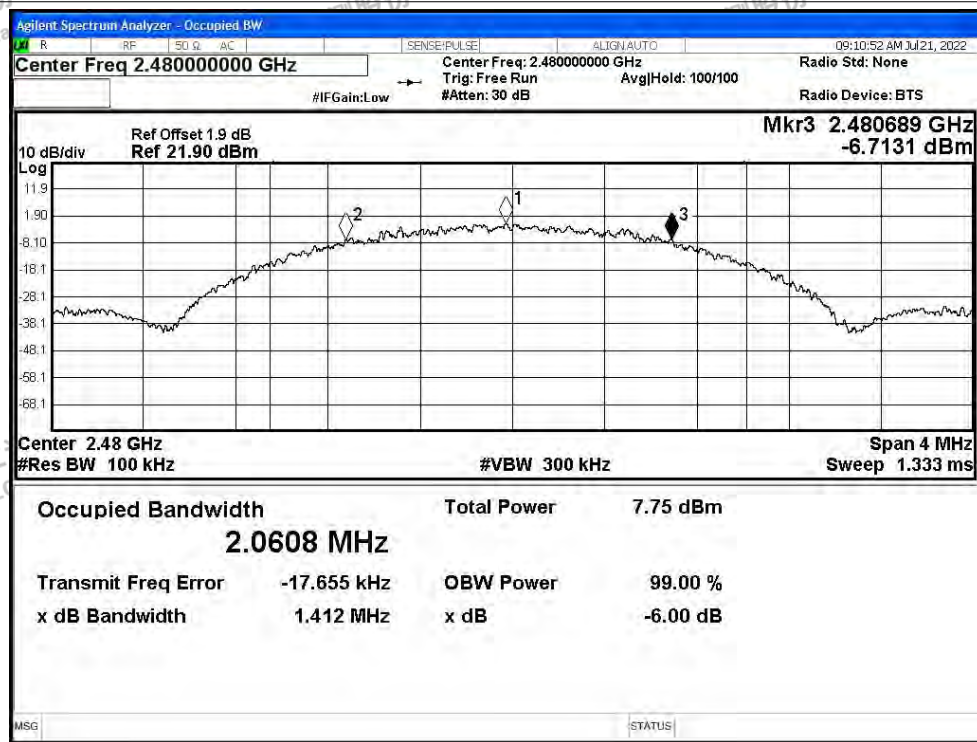
Scan code to check authenticity



-6dB Bandwidth NVNT BLE 2M 2440MHz Ant1



-6dB Bandwidth NVNT BLE 2M 2480MHz Ant1



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## B.2 Maximum Conducted Output Power

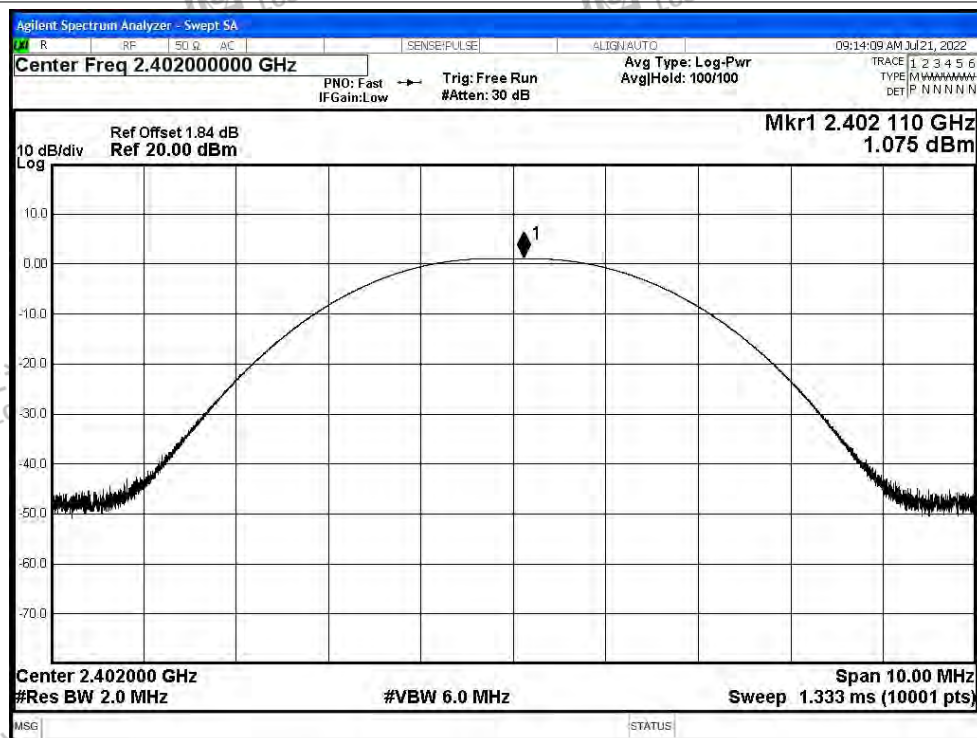
| Condition | Mode   | Frequency<br>(MHz) | Antenna | Conducted Power<br>(dBm) | Duty Factor<br>(dB) | Total Power<br>(dBm) | Limit<br>(dBm) | Verdict |
|-----------|--------|--------------------|---------|--------------------------|---------------------|----------------------|----------------|---------|
| NVNT      | BLE 1M | 2402               | Ant1    | 1.08                     | 0                   | 1.08                 | 30             | Pass    |
| NVNT      | BLE 1M | 2440               | Ant1    | 1.16                     | 0                   | 1.16                 | 30             | Pass    |
| NVNT      | BLE 1M | 2480               | Ant1    | 1.18                     | 0                   | 1.18                 | 30             | Pass    |
| NVNT      | BLE 2M | 2402               | Ant1    | 1.13                     | 0                   | 1.13                 | 30             | Pass    |
| NVNT      | BLE 2M | 2440               | Ant1    | 1.1                      | 0                   | 1.1                  | 30             | Pass    |
| NVNT      | BLE 2M | 2480               | Ant1    | 1.2                      | 0                   | 1.2                  | 30             | Pass    |



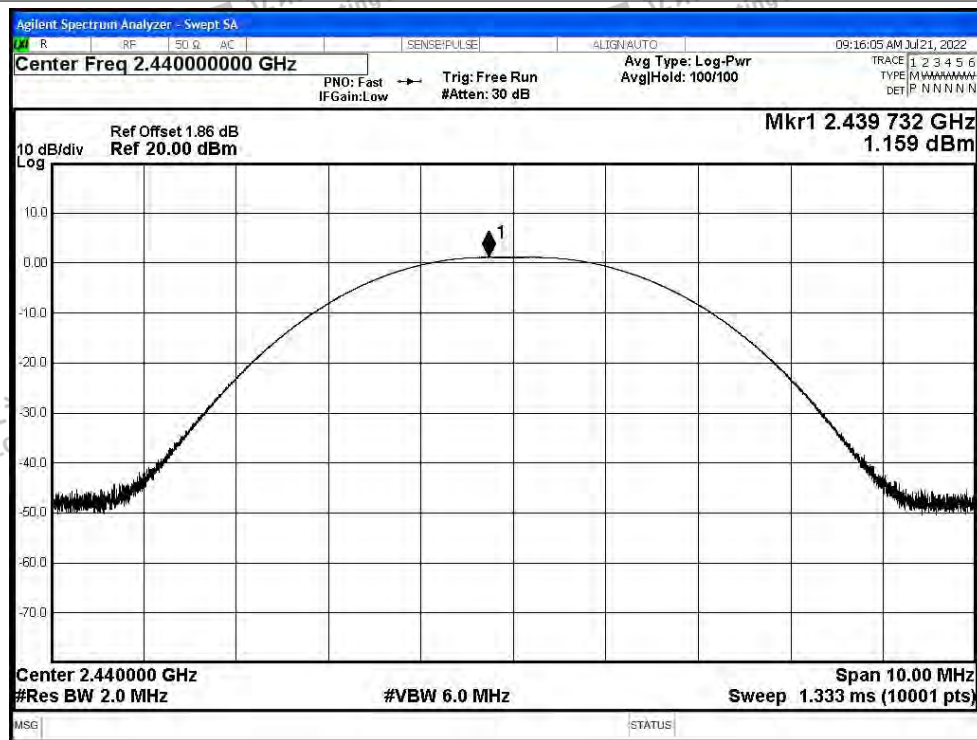


## Test Graphs

Power NVNT BLE 1M 2402MHz Ant1

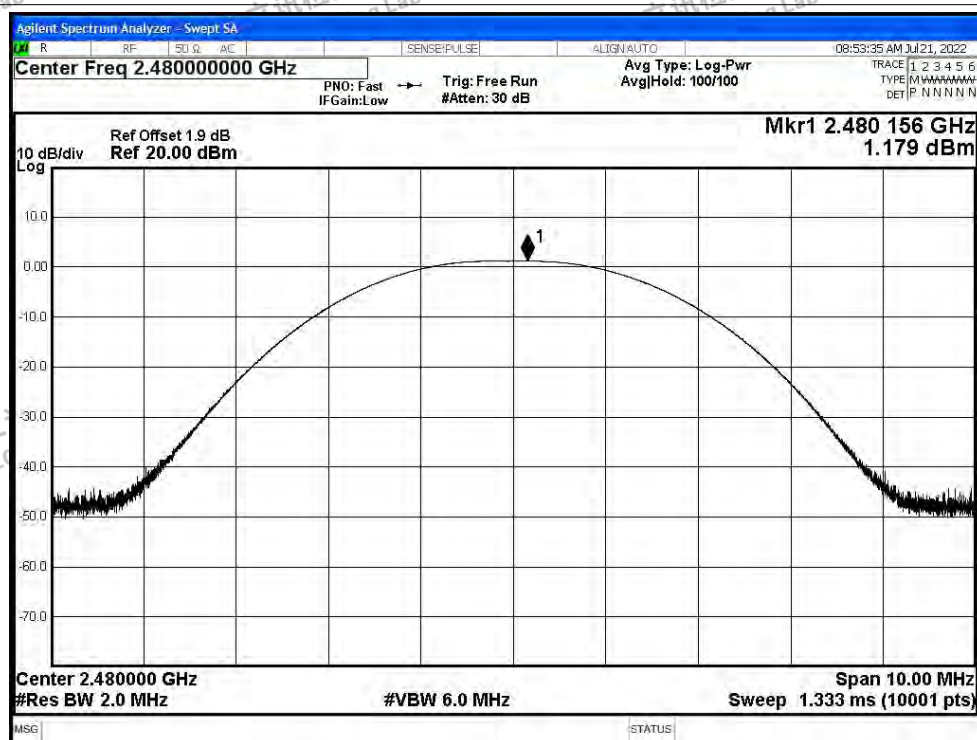


Power NVNT BLE 1M 2440MHz Ant1

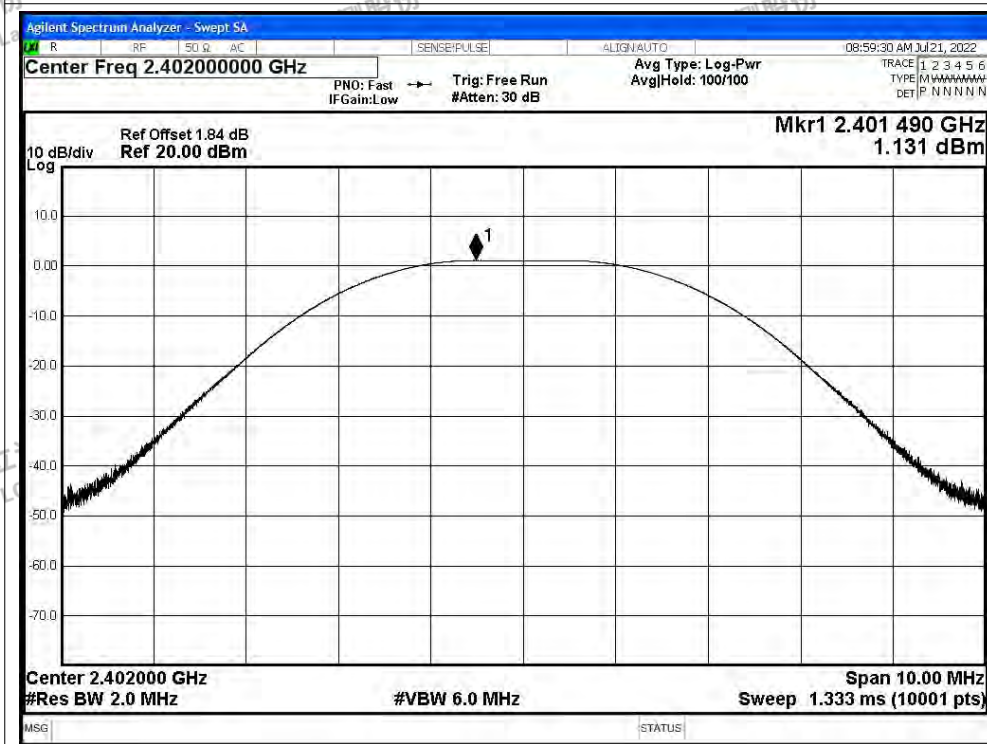




## Power NVNT BLE 1M 2480MHz Ant1

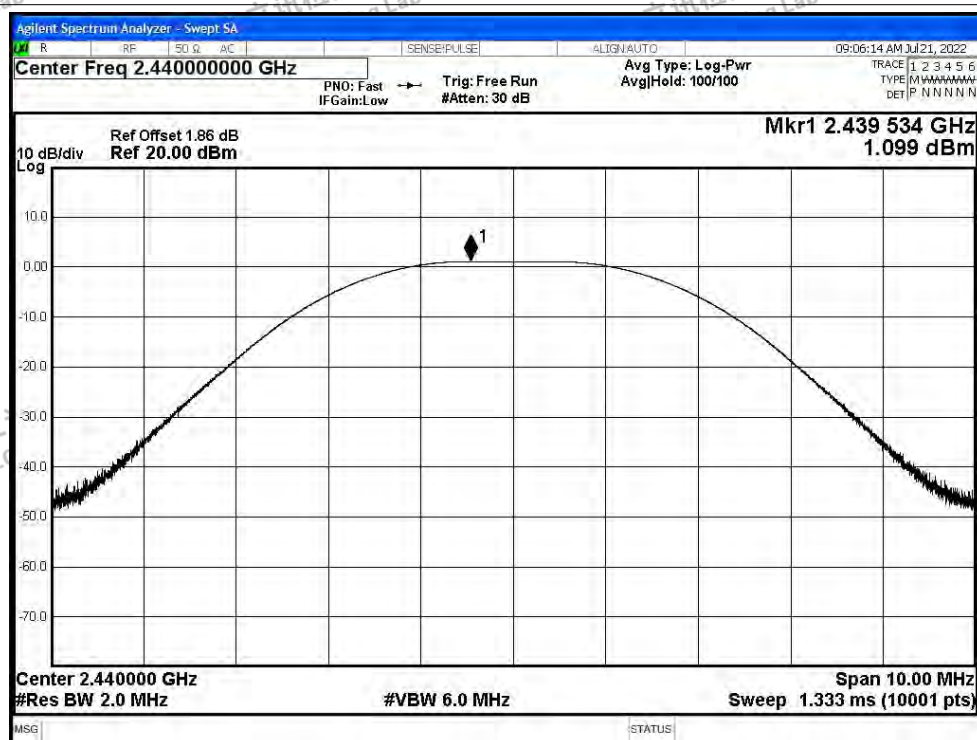


## Power NVNT BLE 2M 2402MHz Ant1

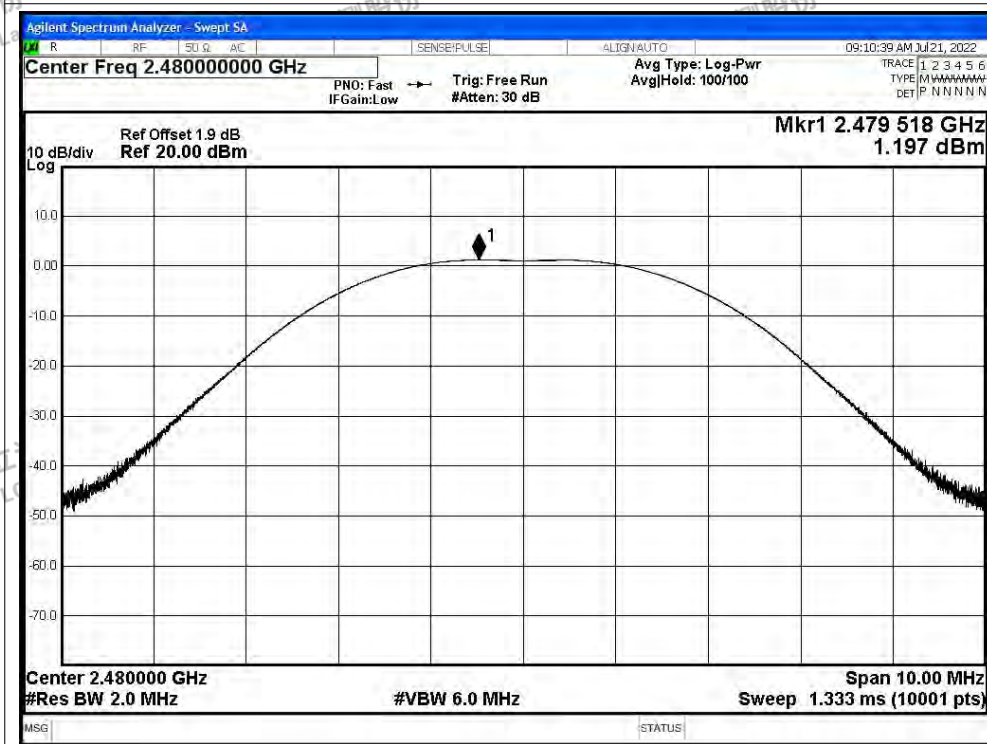




## Power NVNT BLE 2M 2440MHz Ant1



## Power NVNT BLE 2M 2480MHz Ant1





### B.3 Maximum Power Spectral Density Level

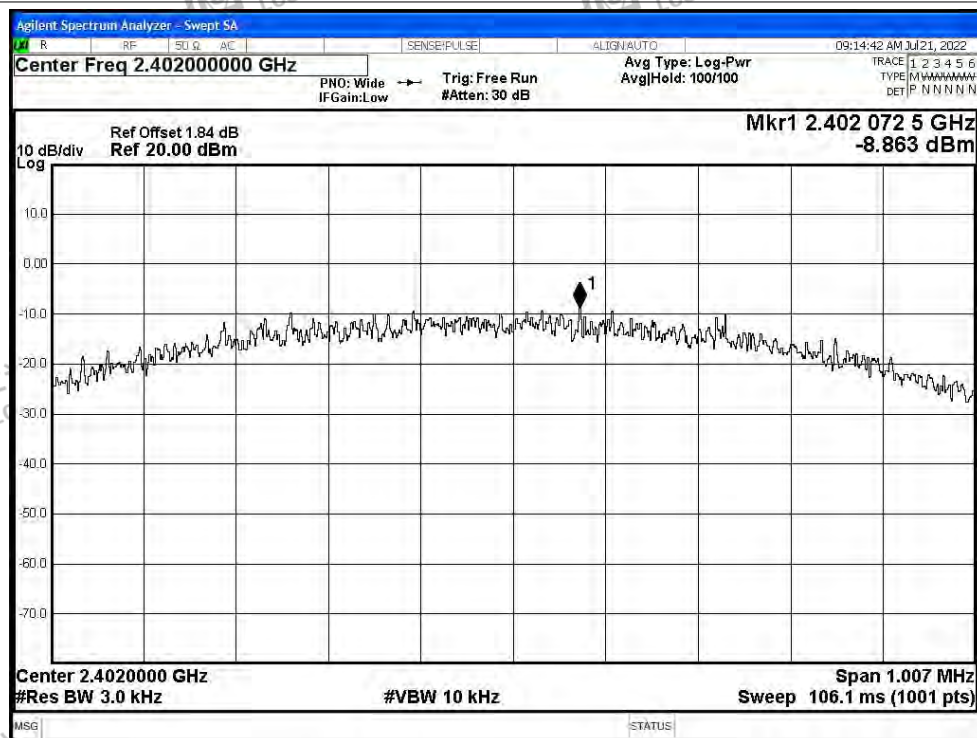
| Condition | Mode   | Frequency (MHz) | Antenna | Conducted PSD (dBm/3kHz) | Duty Factor (dB) | Total PSD (dBm/3kHz) | Limit (dBm/3kHz) | Verdict |
|-----------|--------|-----------------|---------|--------------------------|------------------|----------------------|------------------|---------|
| NVNT      | BLE 1M | 2402            | Ant1    | -8.86                    | 0                | -8.86                | 8                | Pass    |
| NVNT      | BLE 1M | 2440            | Ant1    | -9.39                    | 0                | -9.39                | 8                | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | -8.97                    | 0                | -8.97                | 8                | Pass    |
| NVNT      | BLE 2M | 2402            | Ant1    | -11.14                   | 0                | -11.14               | 8                | Pass    |
| NVNT      | BLE 2M | 2440            | Ant1    | -10.55                   | 0                | -10.55               | 8                | Pass    |
| NVNT      | BLE 2M | 2480            | Ant1    | -11.23                   | 0                | -11.23               | 8                | Pass    |



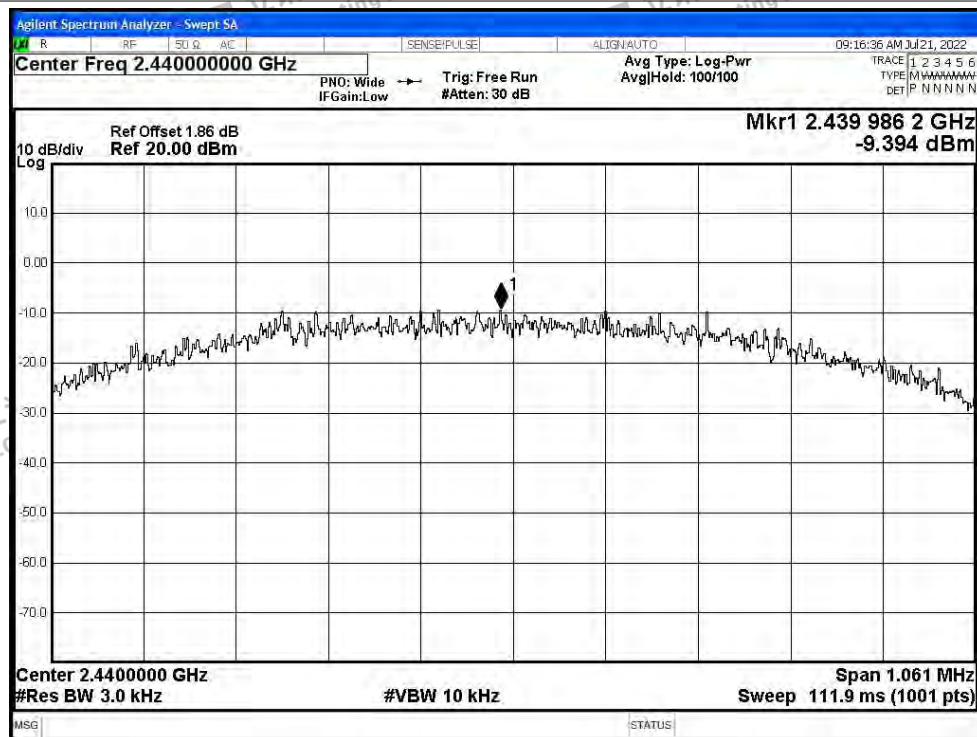


## Test Graphs

PSD NVNT BLE 1M 2402MHz Ant1

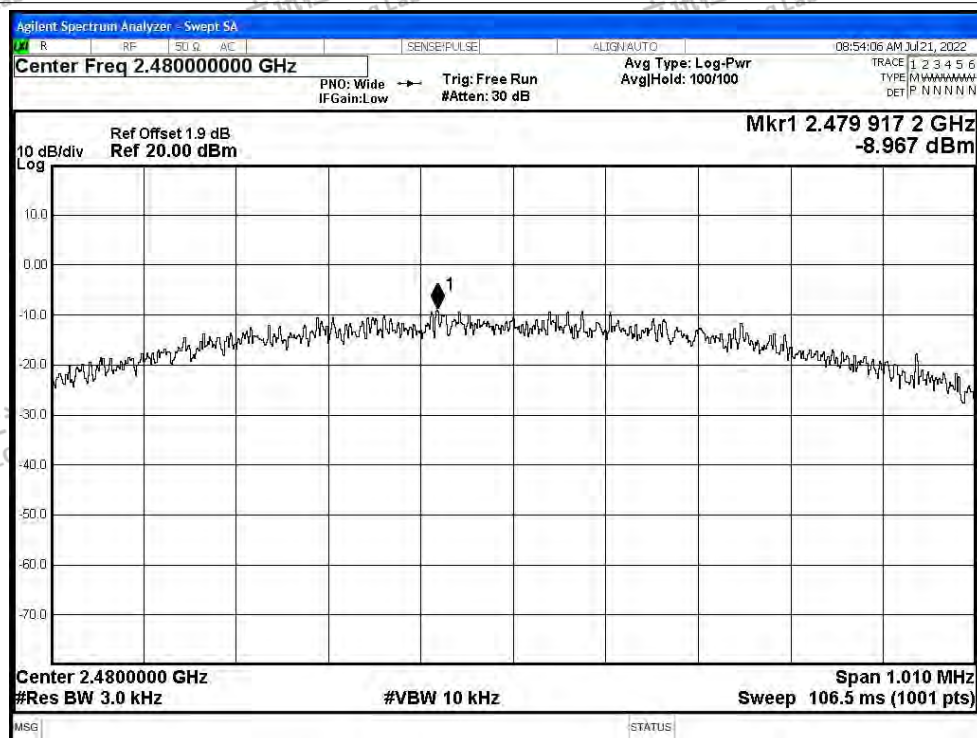


PSD NVNT BLE 1M 2440MHz Ant1

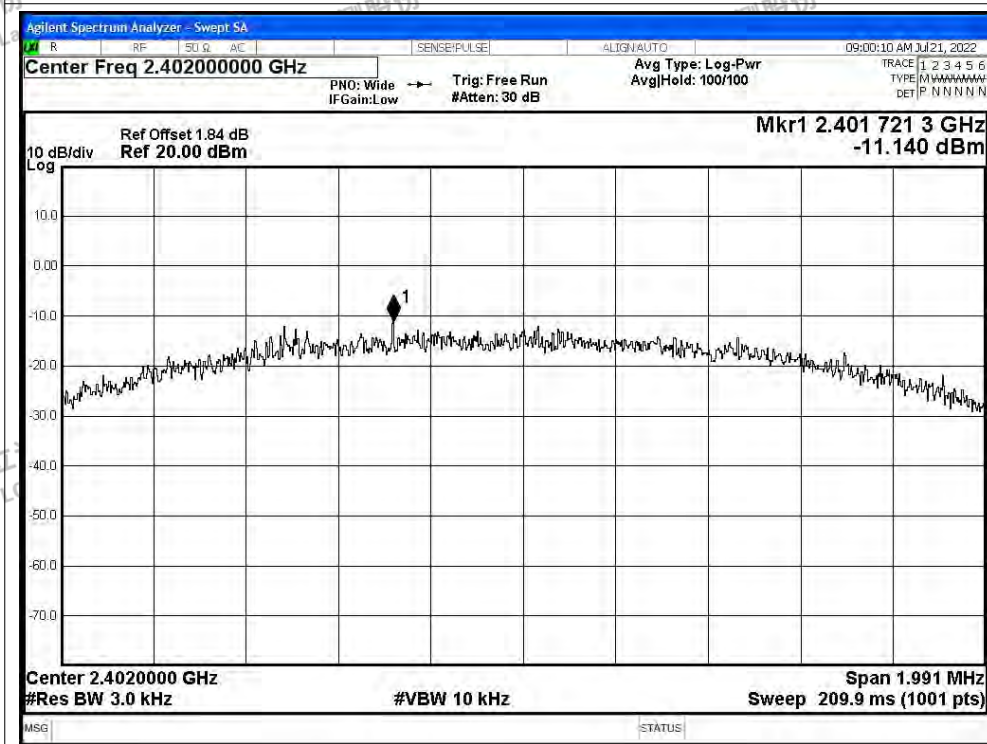




## PSD NVNT BLE 1M 2480MHz Ant1

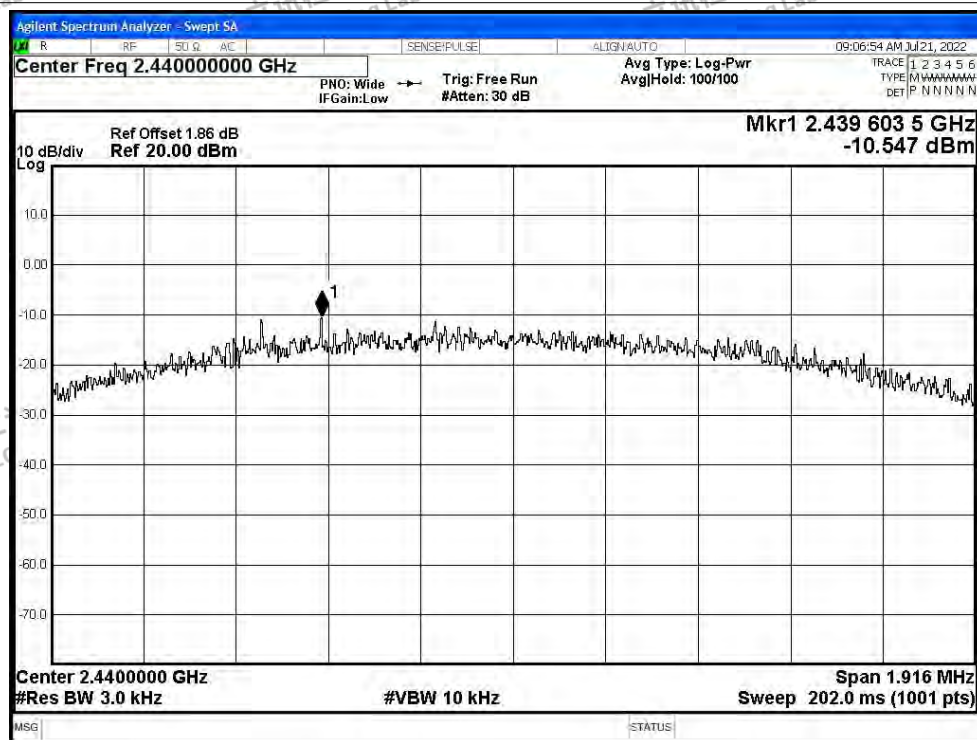


## PSD NVNT BLE 2M 2402MHz Ant1

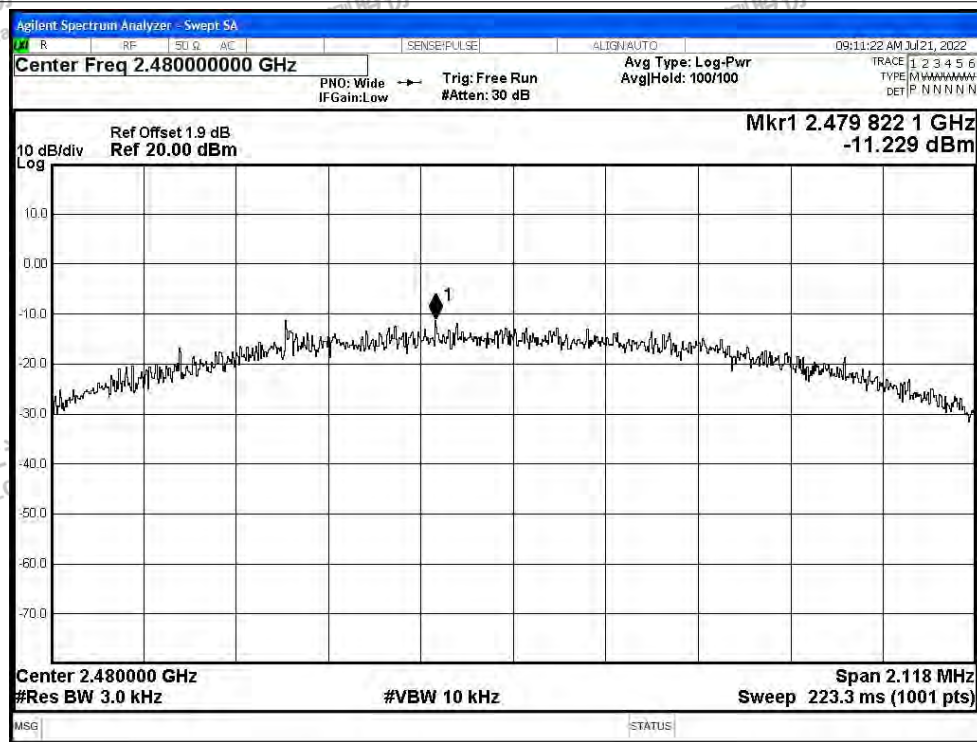




## PSD NVNT BLE 2M 2440MHz Ant1



## 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    | -57.48          | -20         | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | -58.7           | -20         | Pass    |
| NVNT      | BLE 2M | 2402            | Ant1    | -33.84          | -20         | Pass    |
| NVNT      | BLE 2M | 2480            | Ant1    | -56.46          | -20         | Pass    |

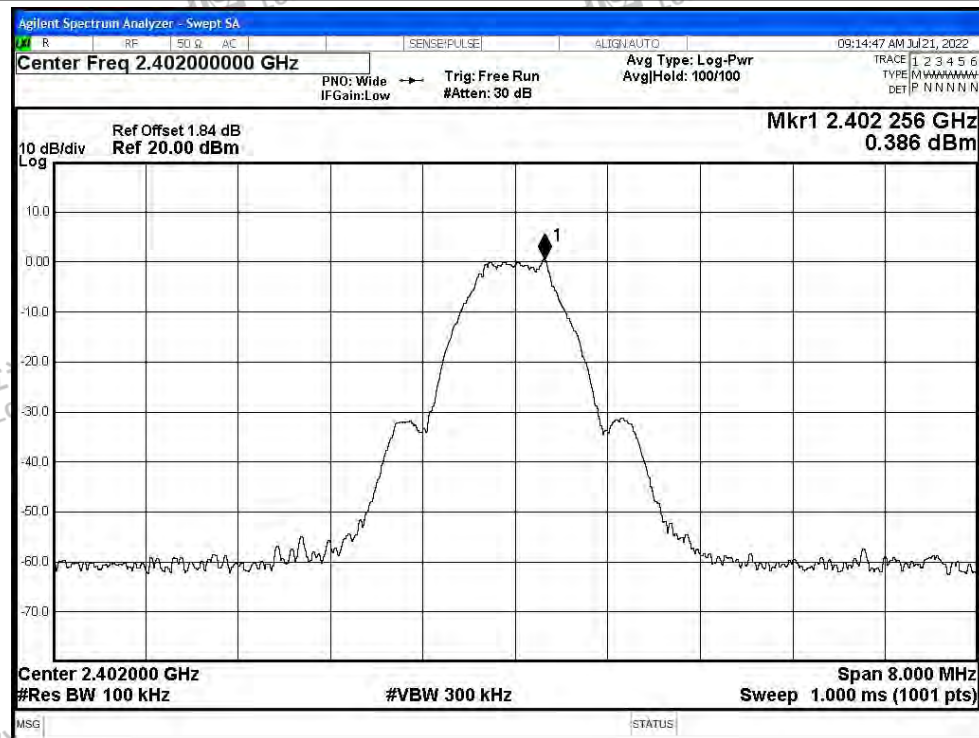


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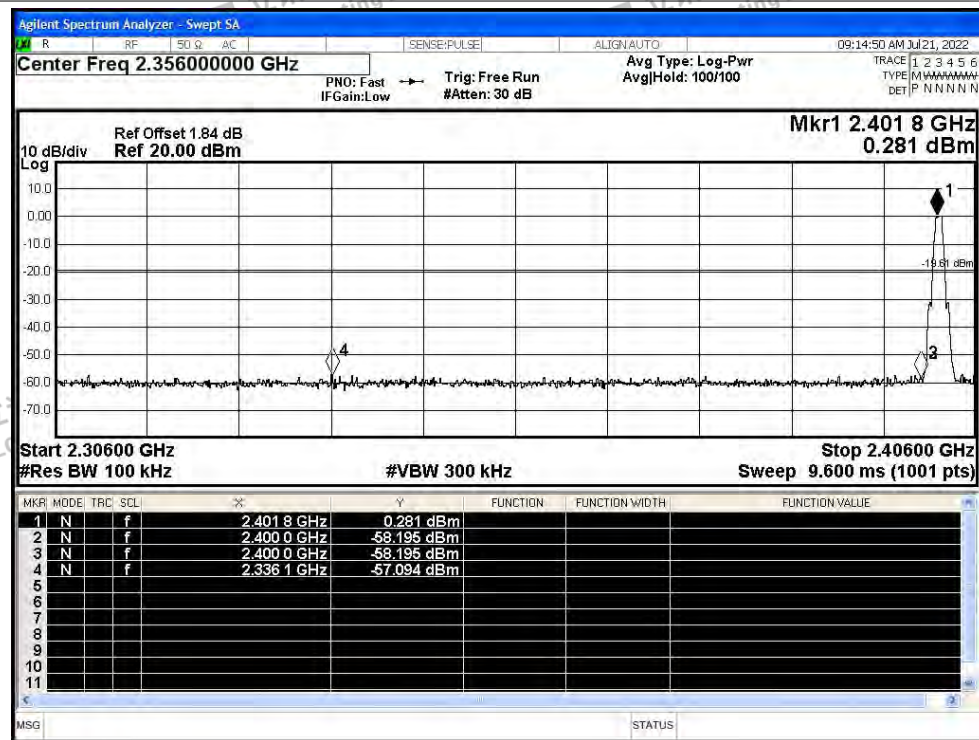


## Test Graphs

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



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



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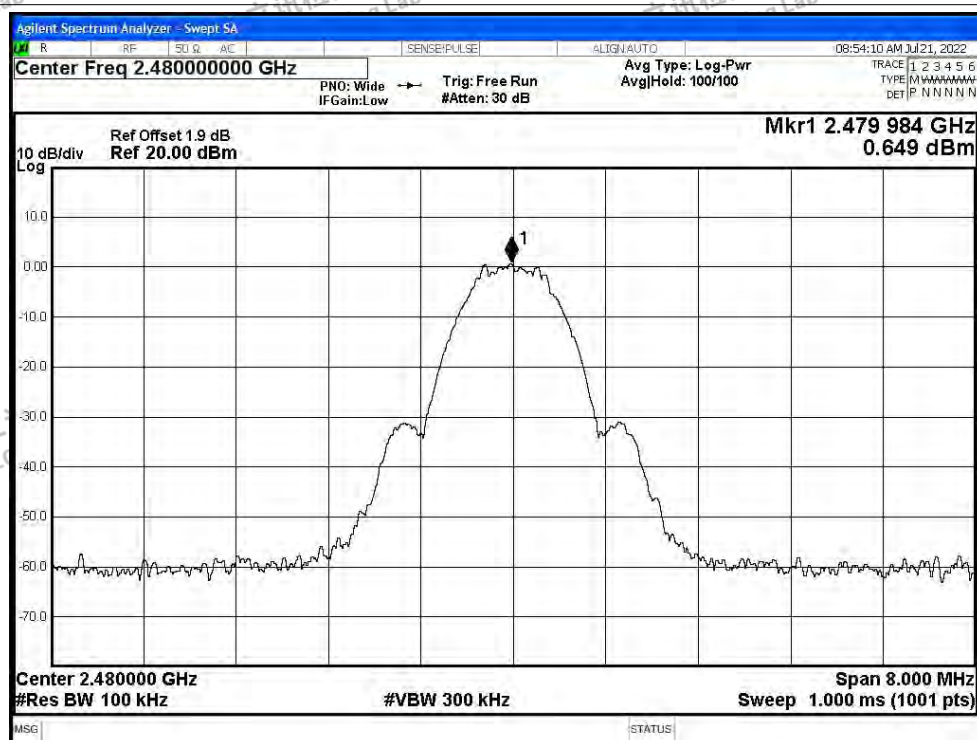
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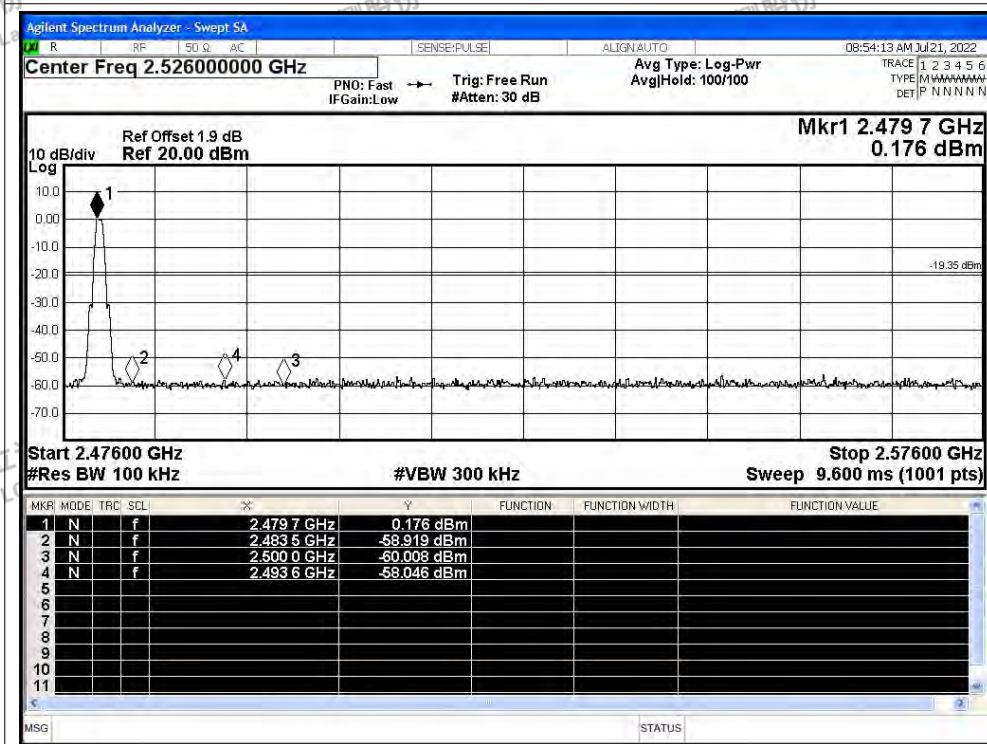
Scan code to check authenticity



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



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



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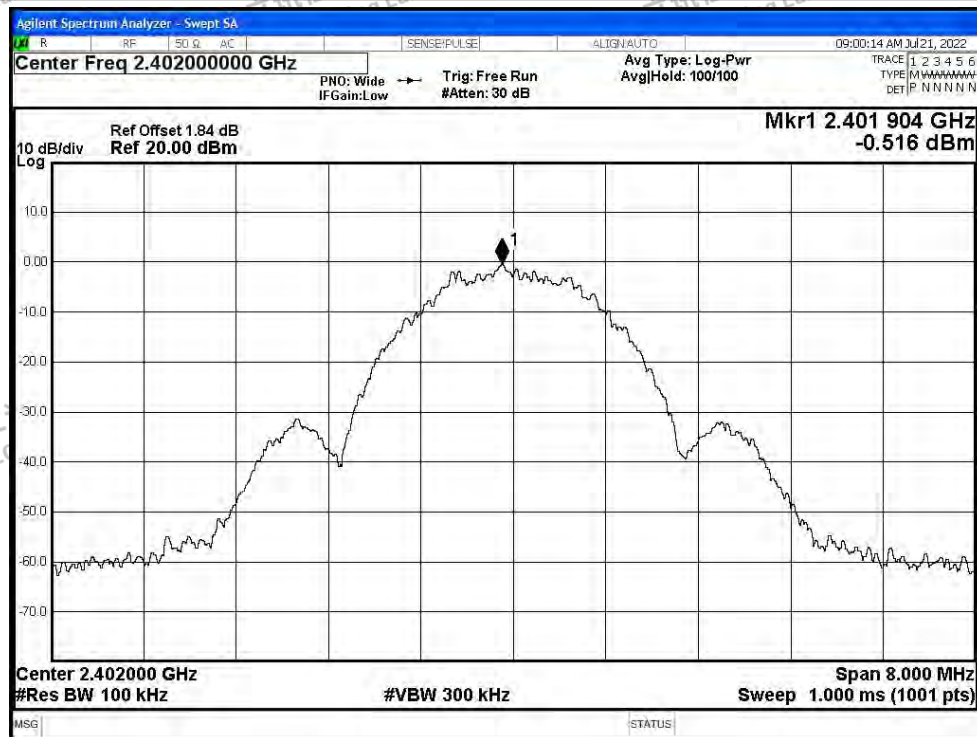
Add: 101, 201 Bldg A &amp; 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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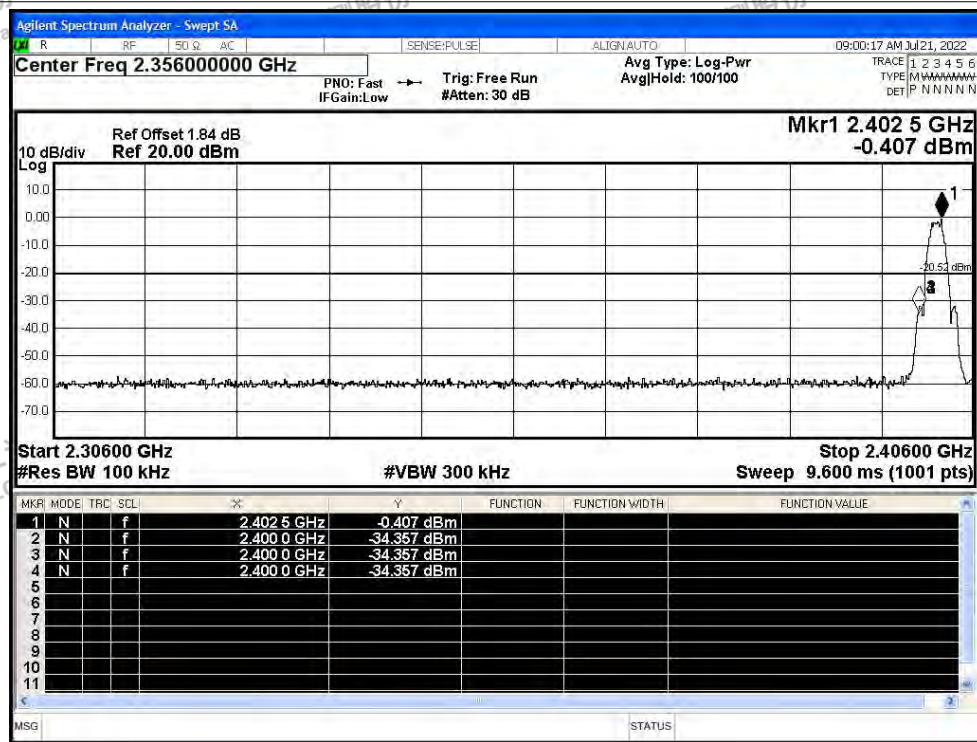
Scan code to check authenticity



## Band Edge NVNT BLE 2M 2402MHz Ant1 Ref



## Band Edge NVNT BLE 2M 2402MHz Ant1 Emission



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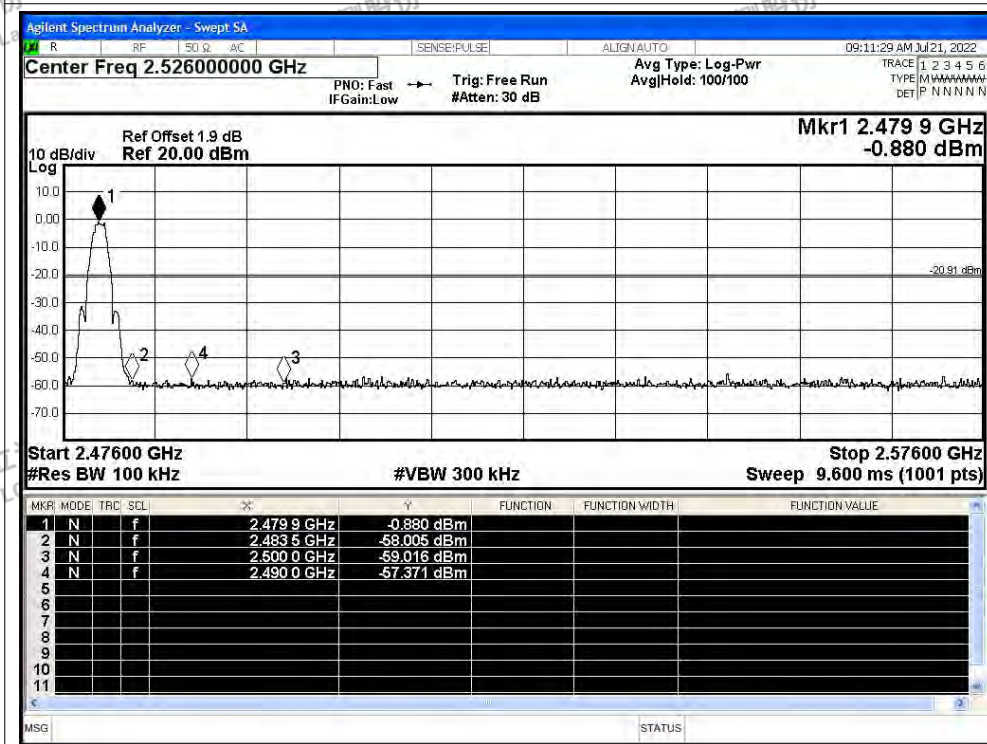
Scan code to check authenticity



## Band Edge NVNT BLE 2M 2480MHz Ant1 Ref



## Band Edge NVNT BLE 2M 2480MHz Ant1 Emission



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## B.5 Conducted RF Spurious Emission

| Condition | Mode   | Frequency (MHz) | Antenna | Max Value (dBc) | Limit (dBc) | Verdict |
|-----------|--------|-----------------|---------|-----------------|-------------|---------|
| NVNT      | BLE 1M | 2402            | Ant1    | -51.75          | -20         | Pass    |
| NVNT      | BLE 1M | 2440            | Ant1    | -50.69          | -20         | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | -56.04          | -20         | Pass    |
| NVNT      | BLE 2M | 2402            | Ant1    | -48.94          | -20         | Pass    |
| NVNT      | BLE 2M | 2440            | Ant1    | -49.52          | -20         | Pass    |
| NVNT      | BLE 2M | 2480            | Ant1    | -54.35          | -20         | Pass    |

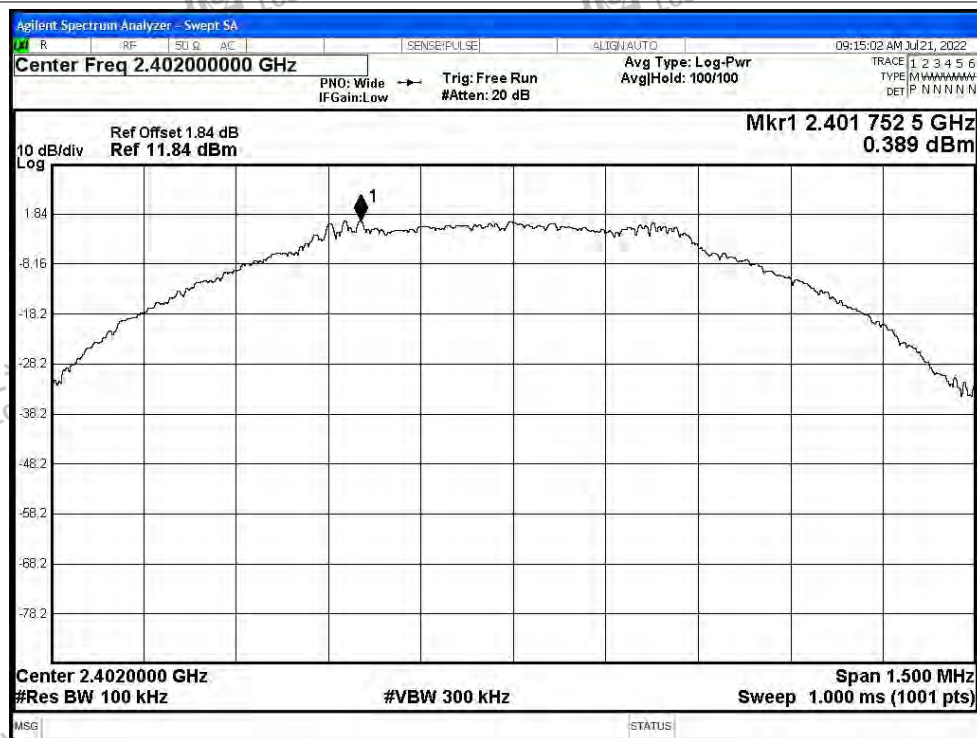


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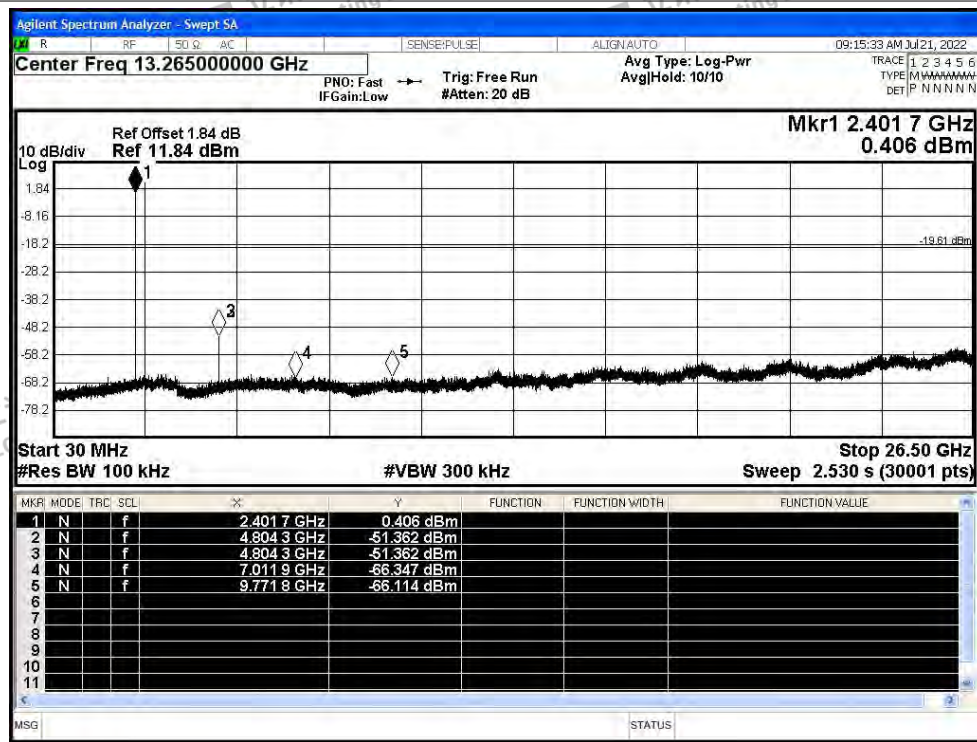


## Test Graphs

Tx. Spurious NVNT BLE 1M 2402MHz Ant1 Ref



Tx. Spurious NVNT BLE 1M 2402MHz Ant1 Emission



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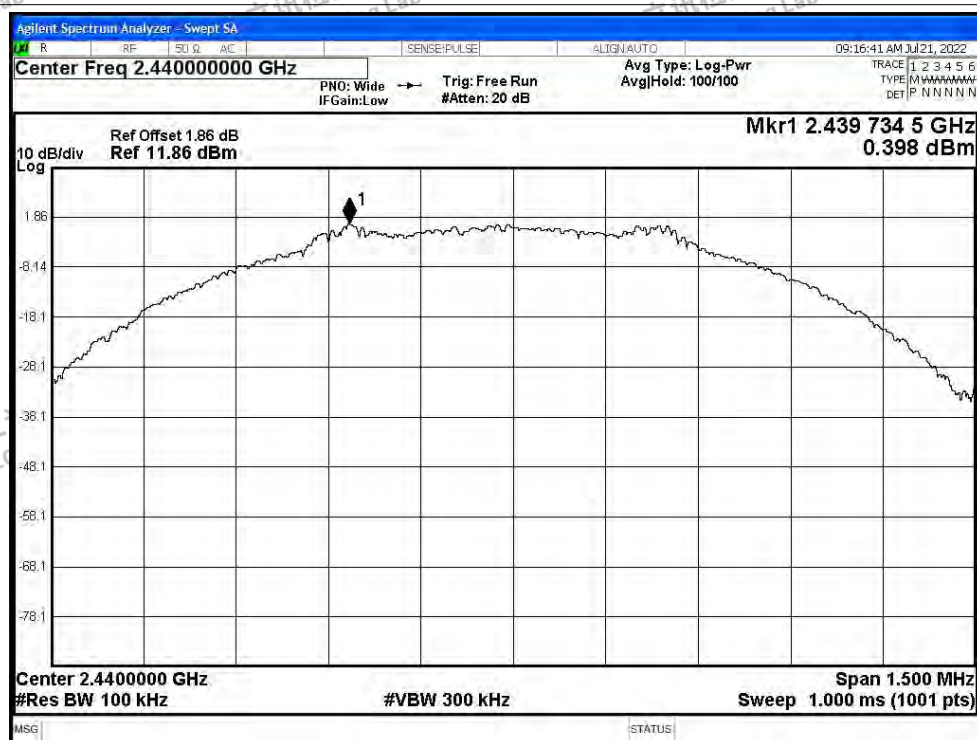
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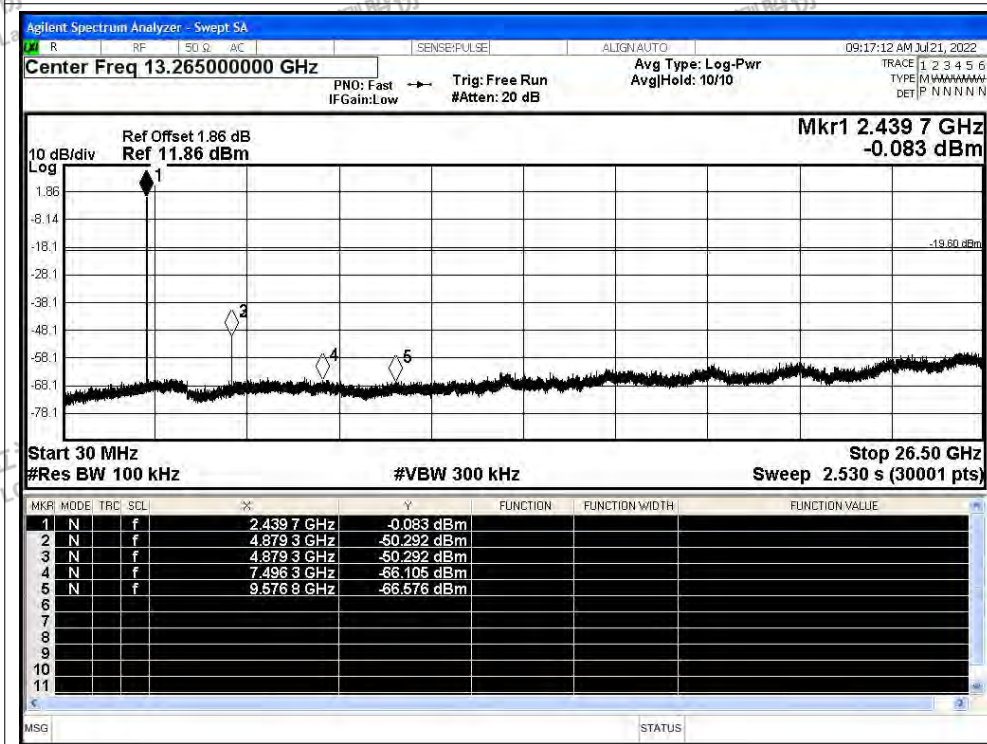
Scan code to check authenticity



Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Ref



Tx. Spurious NVNT BLE 1M 2440MHz Ant1 Emission



Shenzhen LCS Compliance Testing Laboratory Ltd.

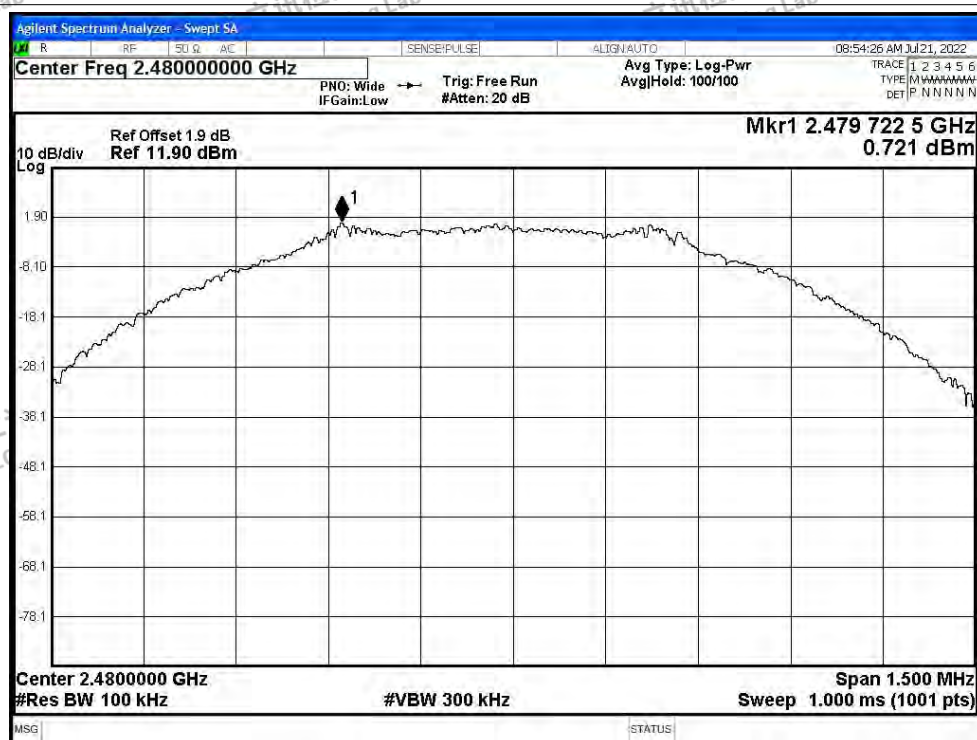
Add: 101, 201 Bldg A &amp; 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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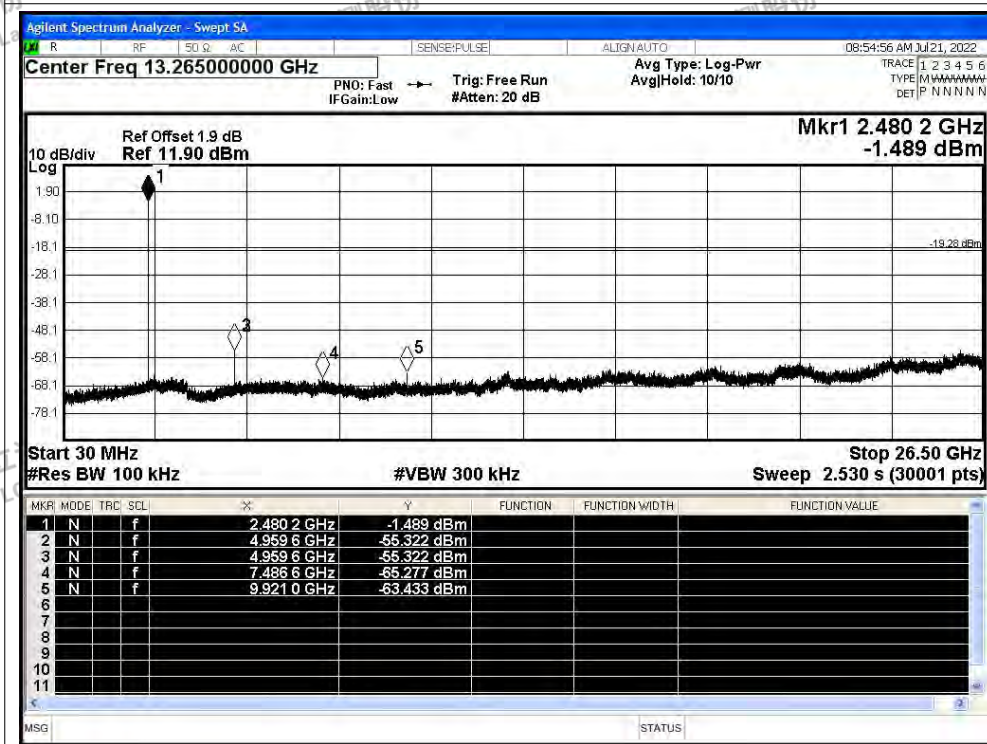
Scan code to check authenticity



Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Ref



Tx. Spurious NVNT BLE 1M 2480MHz Ant1 Emission



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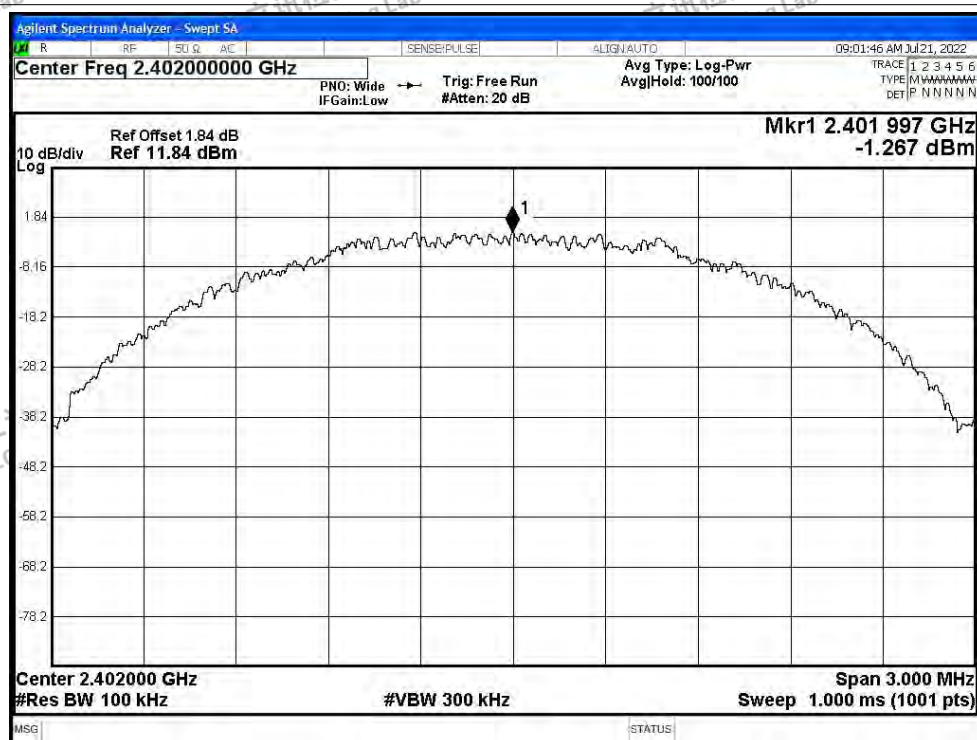
Add: 101, 201 Bldg A &amp; 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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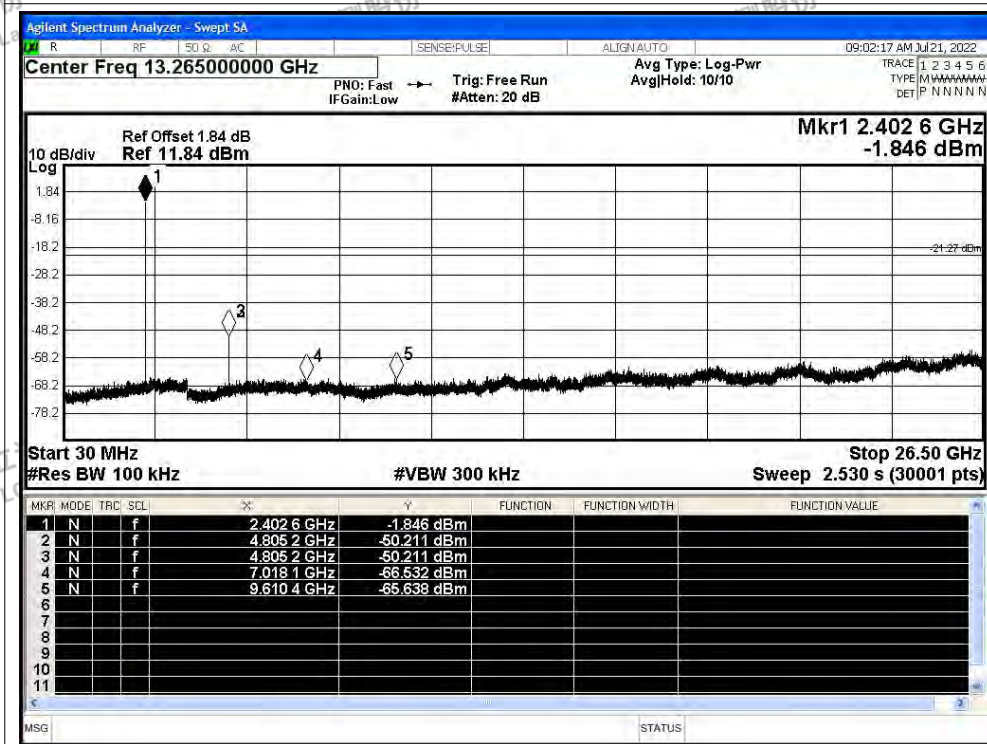
Scan code to check authenticity



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

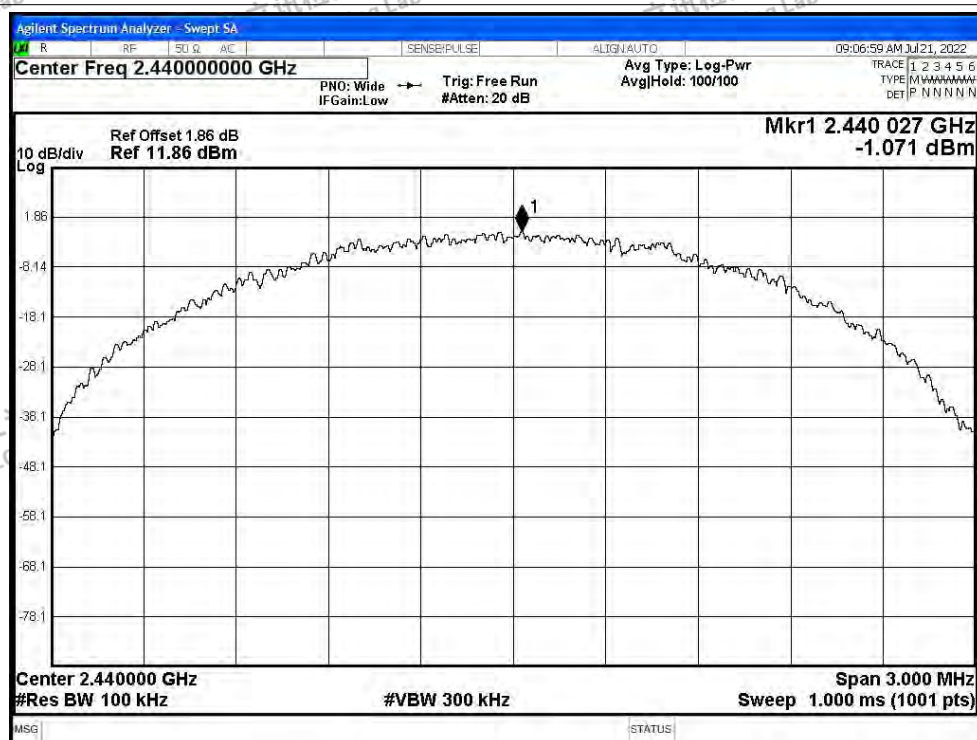


## Tx. Spurious NVNT BLE 2M 2402MHz Ant1 Emission

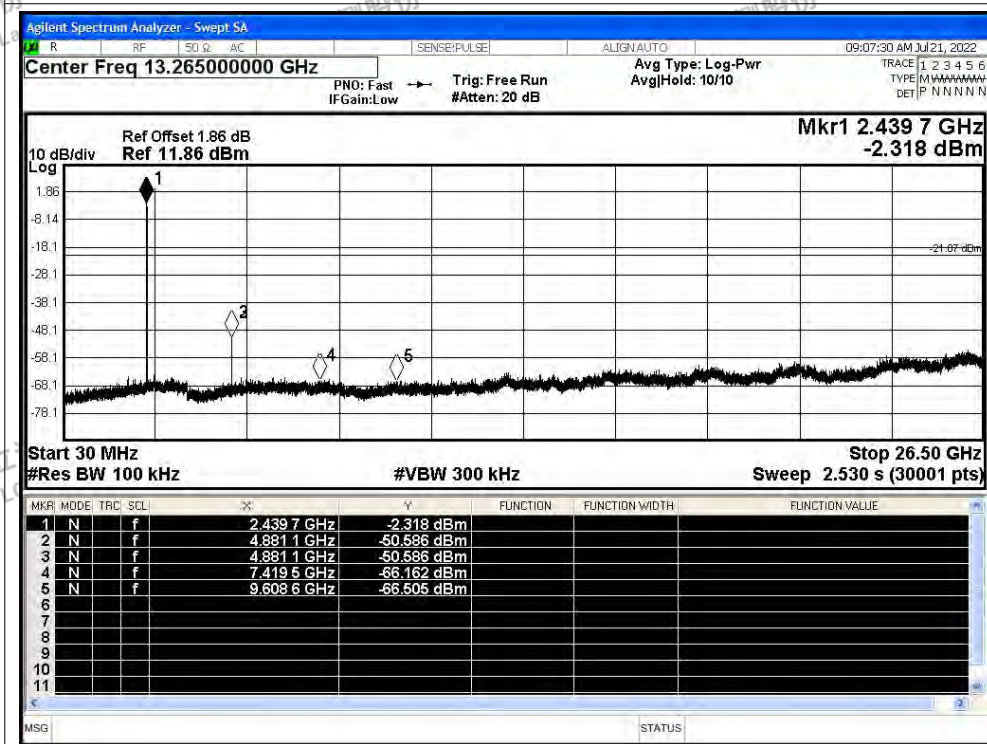




## Tx. Spurious NVNT BLE 2M 2440MHz Ant1 Ref



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



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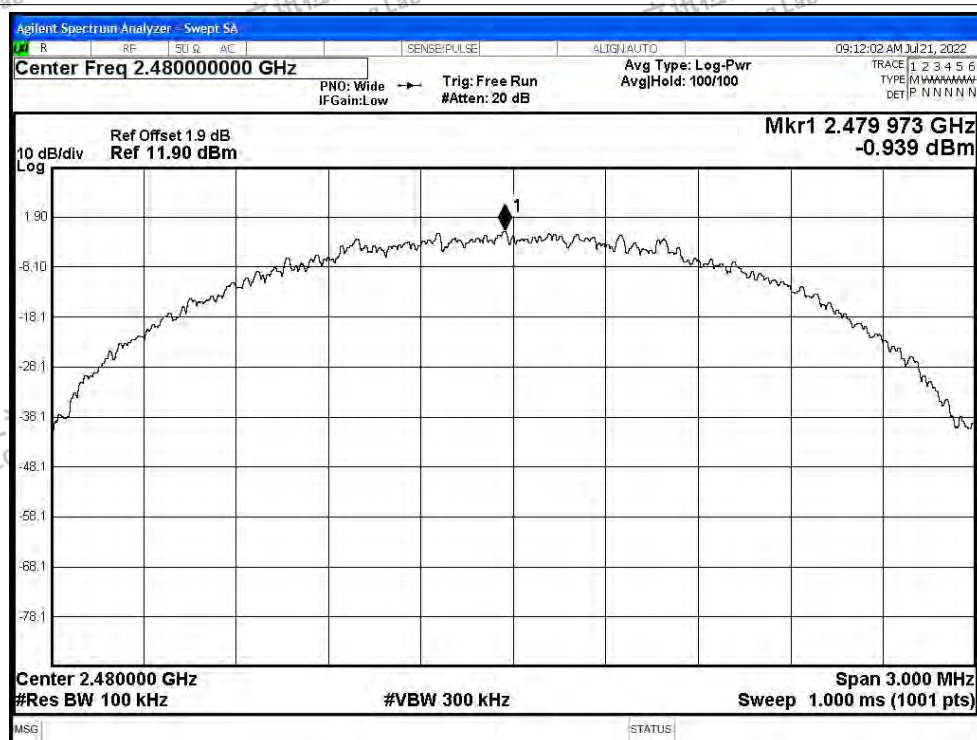
Add: 101, 201 Bldg A &amp; 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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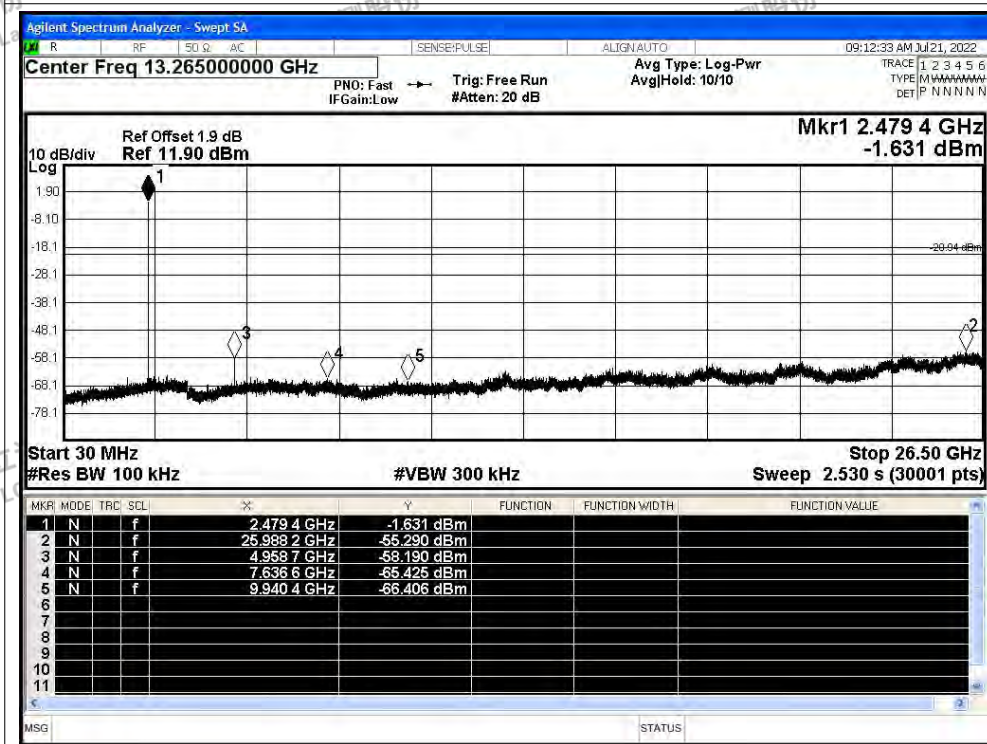
Scan code to check authenticity



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    | 100            | 0                      | 0         |
| NVNT      | BLE 1M | 2440            | Ant1    | 100            | 0                      | 0         |
| NVNT      | BLE 1M | 2480            | Ant1    | 100            | 0                      | 0         |
| NVNT      | BLE 2M | 2402            | Ant1    | 100            | 0                      | 0         |
| NVNT      | BLE 2M | 2440            | Ant1    | 100            | 0                      | 0         |
| NVNT      | BLE 2M | 2480            | Ant1    | 100            | 0                      | 0         |

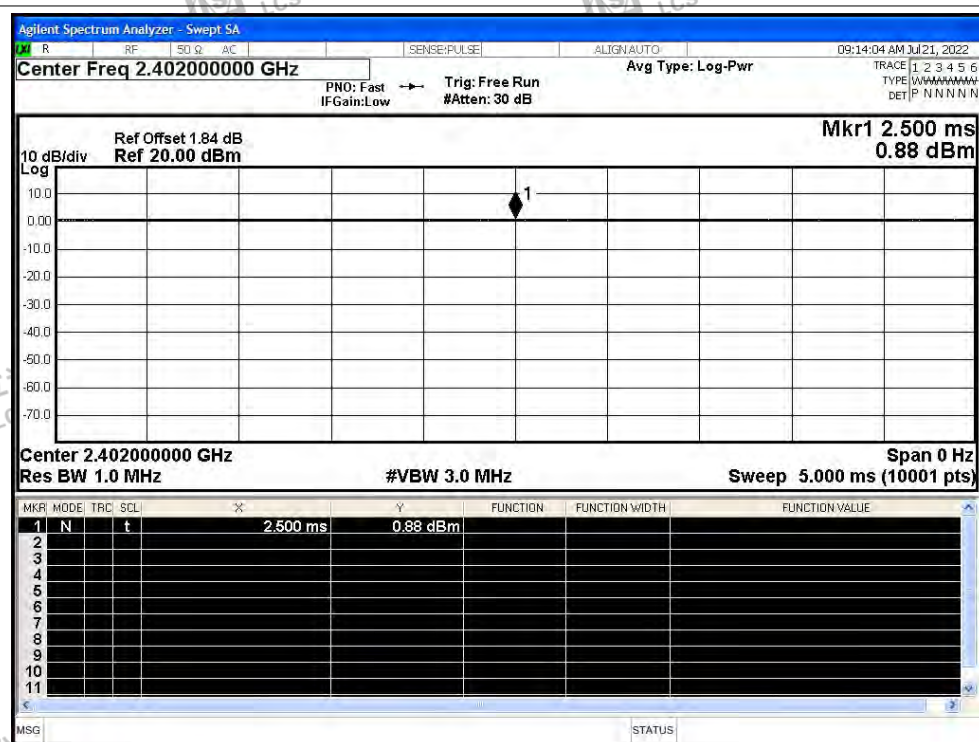


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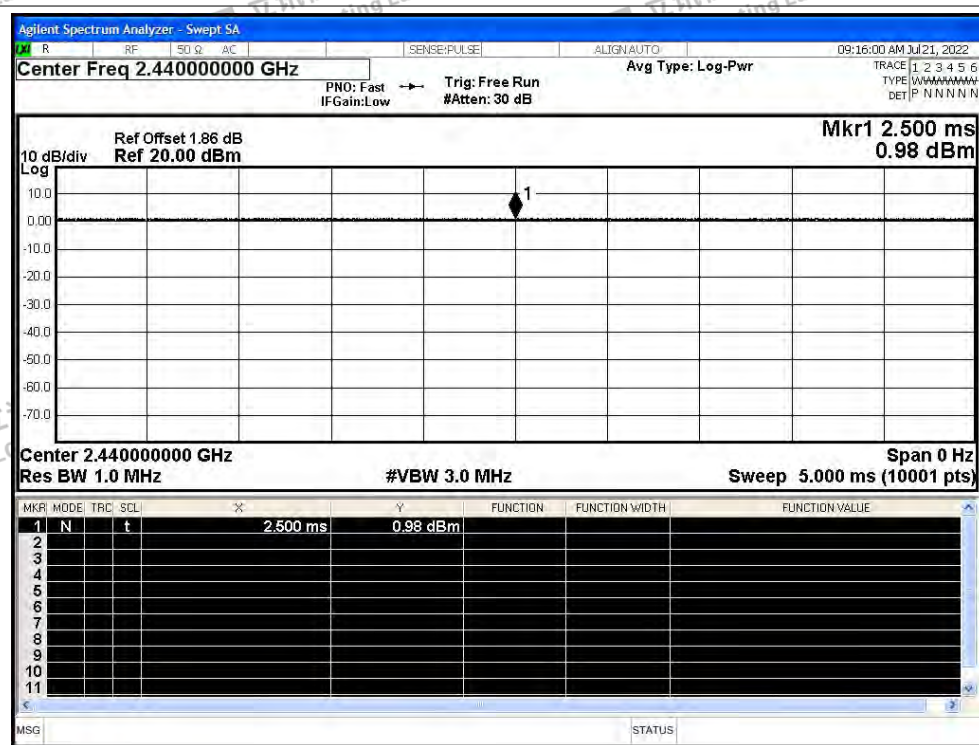


## Test Graphs

## Duty Cycle NVNT BLE 1M 2402MHz Ant1



## Duty Cycle NVNT BLE 1M 2440MHz Ant1



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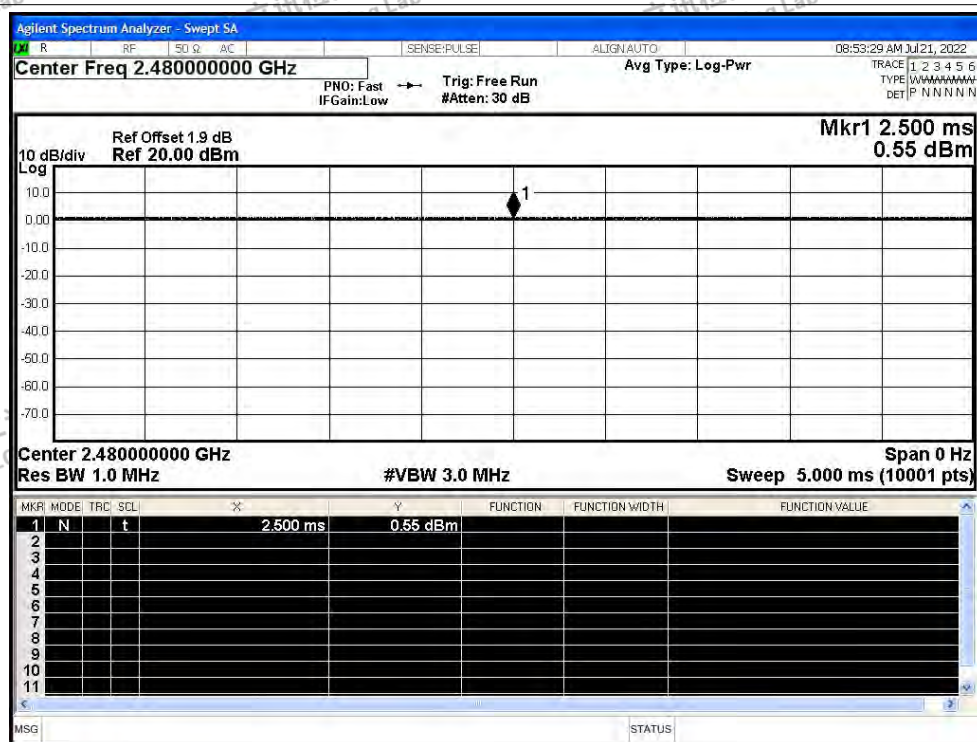
Add: 101, 201 Bldg A &amp; 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com

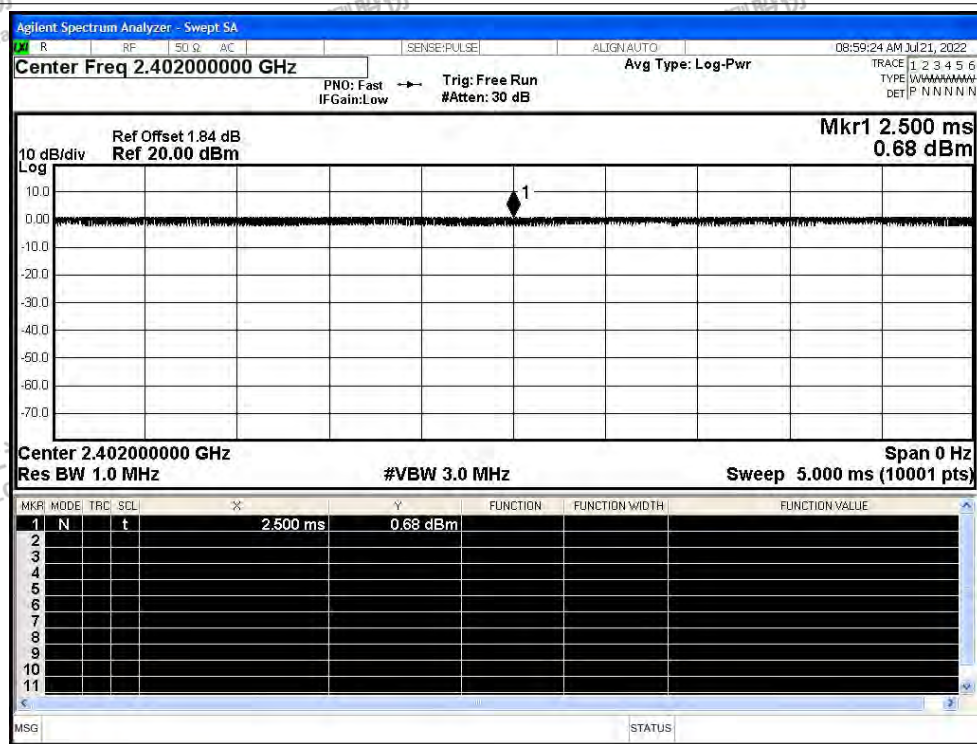
Scan code to check authenticity



## Duty Cycle NVNT BLE 1M 2480MHz Ant1

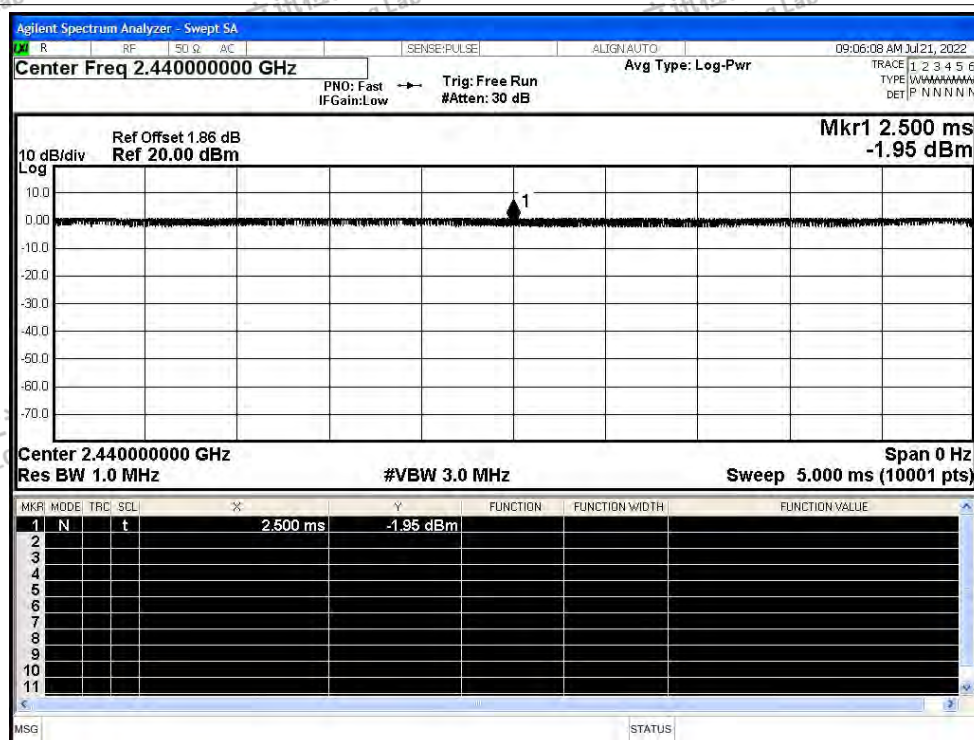


## Duty Cycle NVNT BLE 2M 2402MHz Ant1

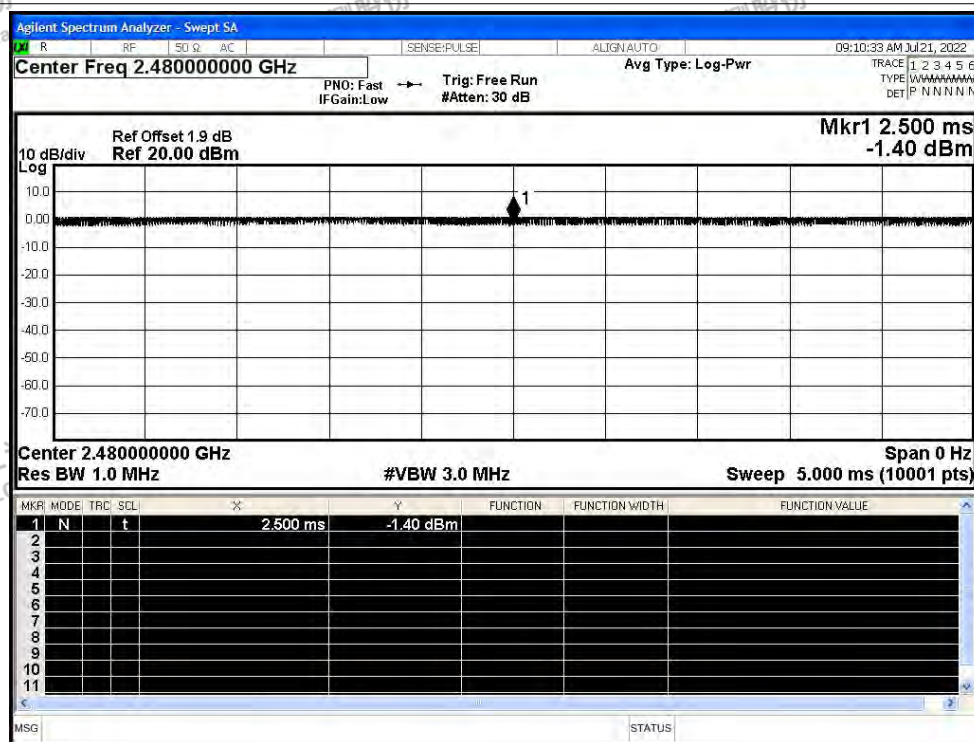




## Duty Cycle NVNT BLE 2M 2440MHz Ant1



## Duty Cycle NVNT BLE 2M 2480MHz Ant1





## B.7 Restrict Band

| Condition | Mode   | Frequency (MHz) | Antenna | Spur Freq (MHz) | Power (dBm) | Gain (dBi) | E (dBuV/m) | Detector | Limit (dBuV/m) | Verdict |
|-----------|--------|-----------------|---------|-----------------|-------------|------------|------------|----------|----------------|---------|
| NVNT      | BLE 1M | 2402            | Ant1    | 2310            | -50.66      | 2.15       | 46.72      | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2402            | Ant1    | 2310            | -59.93      | 2.15       | 37.45      | Average  | 54             | Pass    |
| NVNT      | BLE 1M | 2402            | Ant1    | 2369.808        | -47.57      | 2.15       | 49.81      | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2402            | Ant1    | 2384.112        | -59.27      | 2.15       | 38.11      | Average  | 54             | Pass    |
| NVNT      | BLE 1M | 2402            | Ant1    | 2390            | -49.33      | 2.15       | 48.05      | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2402            | Ant1    | 2390            | -59.73      | 2.15       | 37.65      | Average  | 54             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2483.5          | -49.8       | 2.15       | 47.58      | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2483.5          | -59         | 2.15       | 38.38      | Average  | 54             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2493.64         | -47.23      | 2.15       | 50.15      | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2498.608        | -58.75      | 2.15       | 38.63      | Average  | 54             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2500            | -48.5       | 2.15       | 48.88      | Peak     | 74             | Pass    |
| NVNT      | BLE 1M | 2480            | Ant1    | 2500            | -59.72      | 2.15       | 37.66      | Average  | 54             | Pass    |
| NVNT      | BLE 2M | 2402            | Ant1    | 2310            | -49.93      | 2.15       | 47.45      | Peak     | 74             | Pass    |
| NVNT      | BLE 2M | 2402            | Ant1    | 2310            | -60.73      | 2.15       | 36.65      | Average  | 54             | Pass    |
| NVNT      | BLE 2M | 2402            | Ant1    | 2322.096        | -47.83      | 2.15       | 49.55      | Peak     | 74             | Pass    |
| NVNT      | BLE 2M | 2402            | Ant1    | 2388.144        | -60.38      | 2.15       | 37.00      | Average  | 54             | Pass    |
| NVNT      | BLE 2M | 2402            | Ant1    | 2390            | -50.43      | 2.15       | 46.95      | Peak     | 74             | Pass    |
| NVNT      | BLE 2M | 2402            | Ant1    | 2390            | -60.38      | 2.15       | 37.00      | Average  | 54             | Pass    |
| NVNT      | BLE 2M | 2480            | Ant1    | 2483.5          | -46.99      | 2.15       | 50.39      | Peak     | 74             | Pass    |
| NVNT      | BLE 2M | 2480            | Ant1    | 2483.5          | -56.98      | 2.15       | 40.40      | Average  | 54             | Pass    |
| NVNT      | BLE 2M | 2480            | Ant1    | 2483.584        | -45.93      | 2.15       | 51.45      | Peak     | 74             | Pass    |
| NVNT      | BLE 2M | 2480            | Ant1    | 2483.512        | -56.98      | 2.15       | 40.40      | Average  | 54             | Pass    |
| NVNT      | BLE 2M | 2480            | Ant1    | 2500            | -49.37      | 2.15       | 48.01      | Peak     | 74             | Pass    |
| NVNT      | BLE 2M | 2480            | Ant1    | 2500            | -60.13      | 2.15       | 37.25      | Average  | 54             | Pass    |

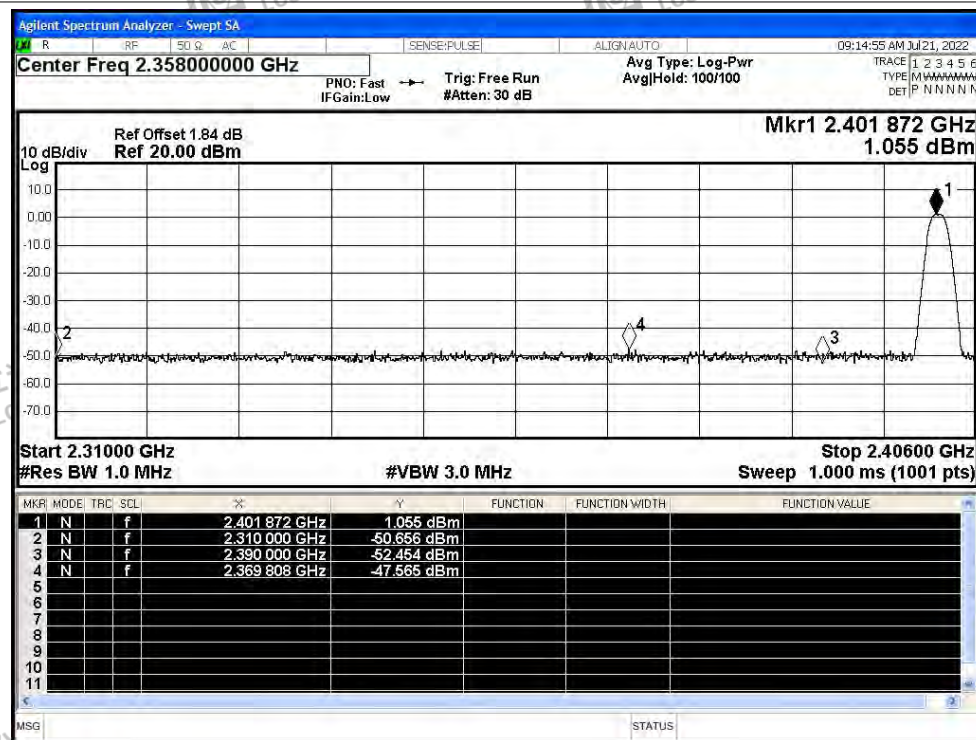


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Tel: +(86) 0755-82591330 | E-mail: webmaster@lcs-cert.com | Web: www.lcs-cert.com  
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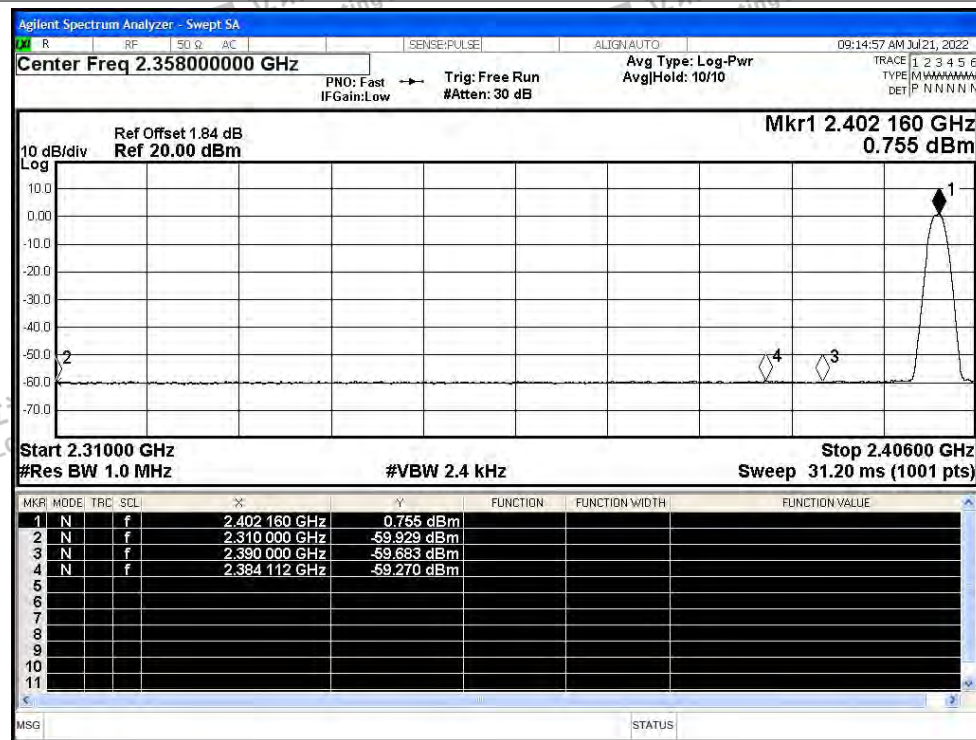


## Test Graphs

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

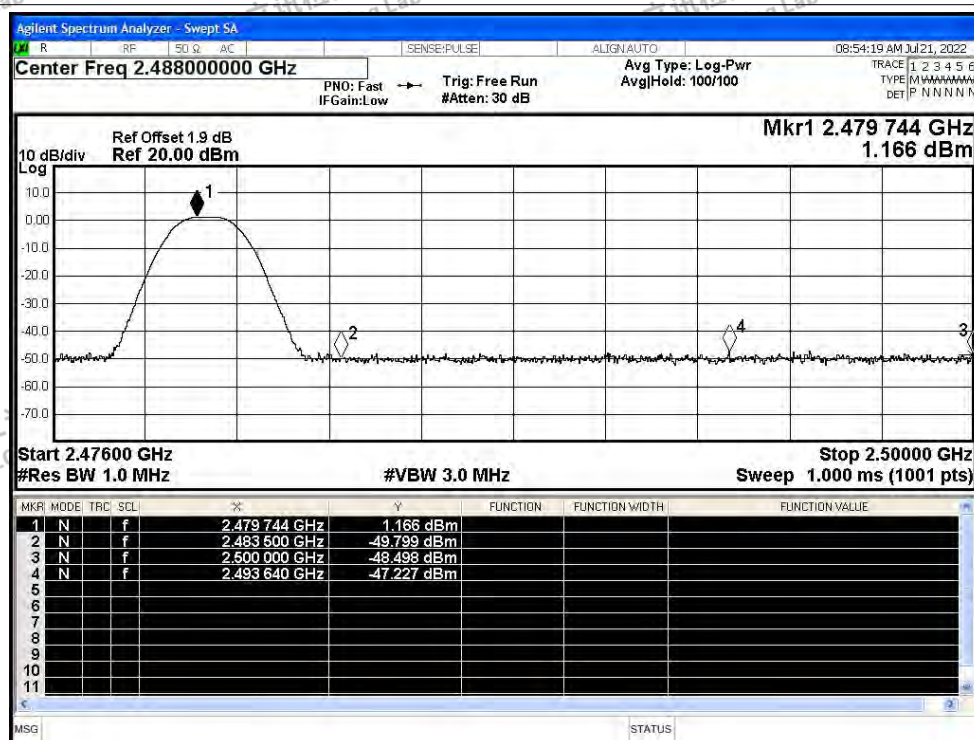


## Restrict Band NVNT BLE 1M 2402MHz Ant1 Average

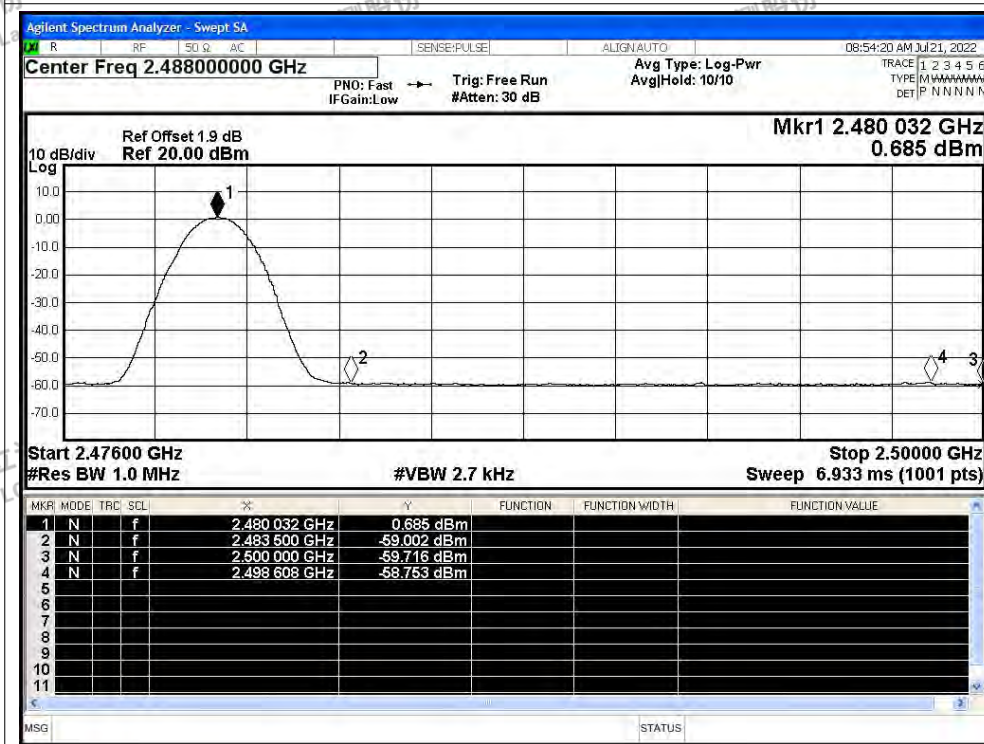




## Restrict Band NVNT BLE 1M 2480MHz Ant1 Peak



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



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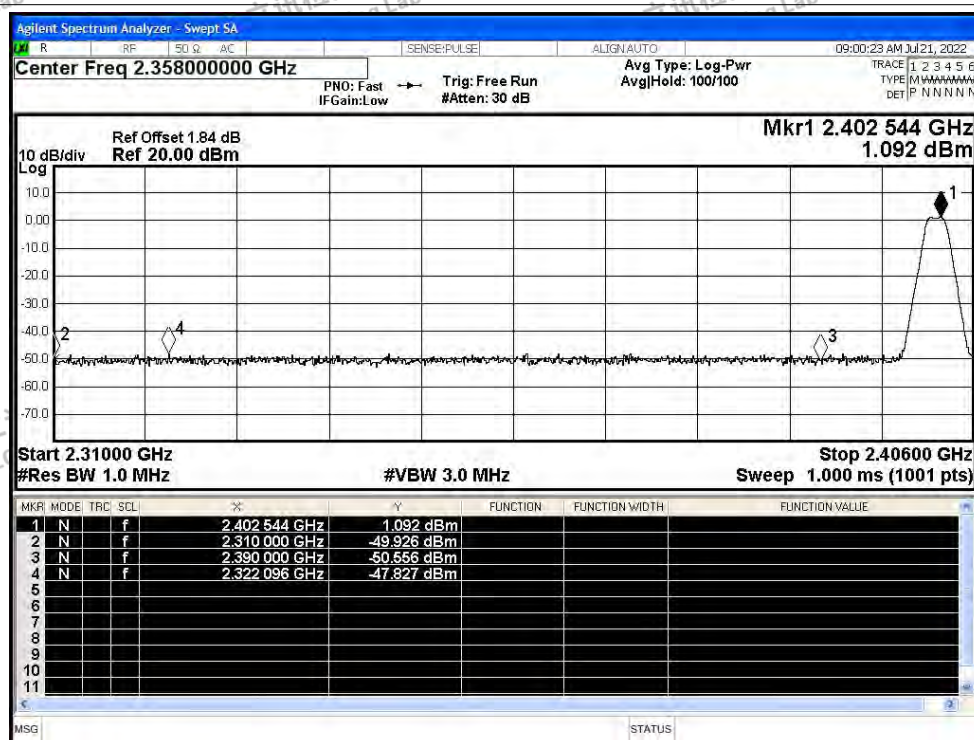
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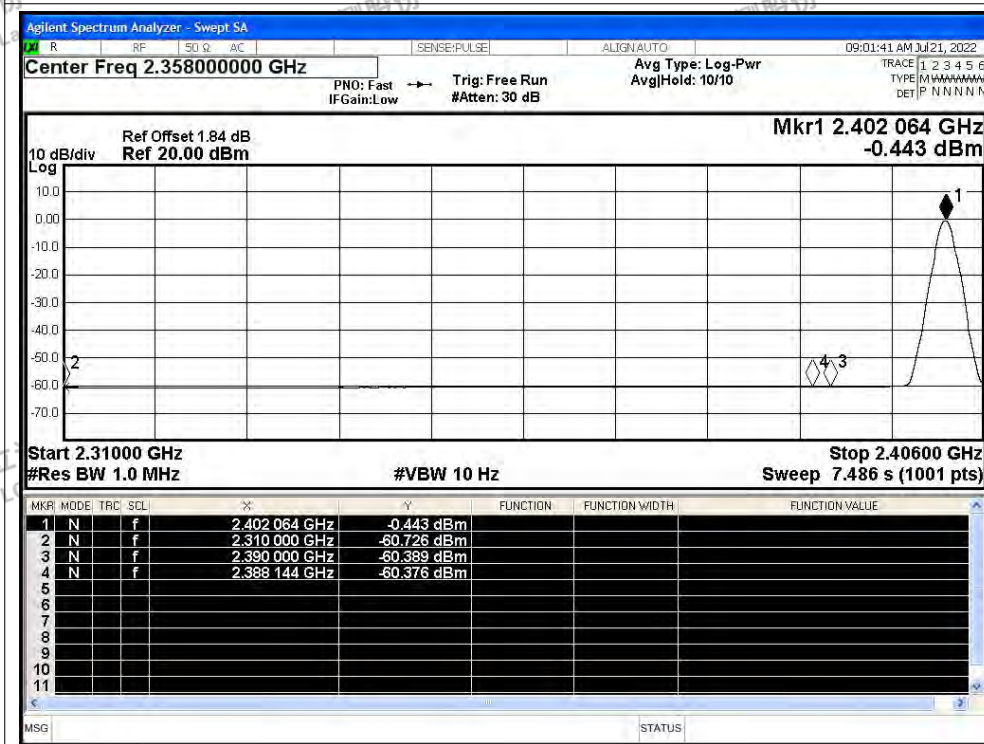
Scan code to check authenticity



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



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



Shenzhen LCS Compliance Testing Laboratory Ltd.

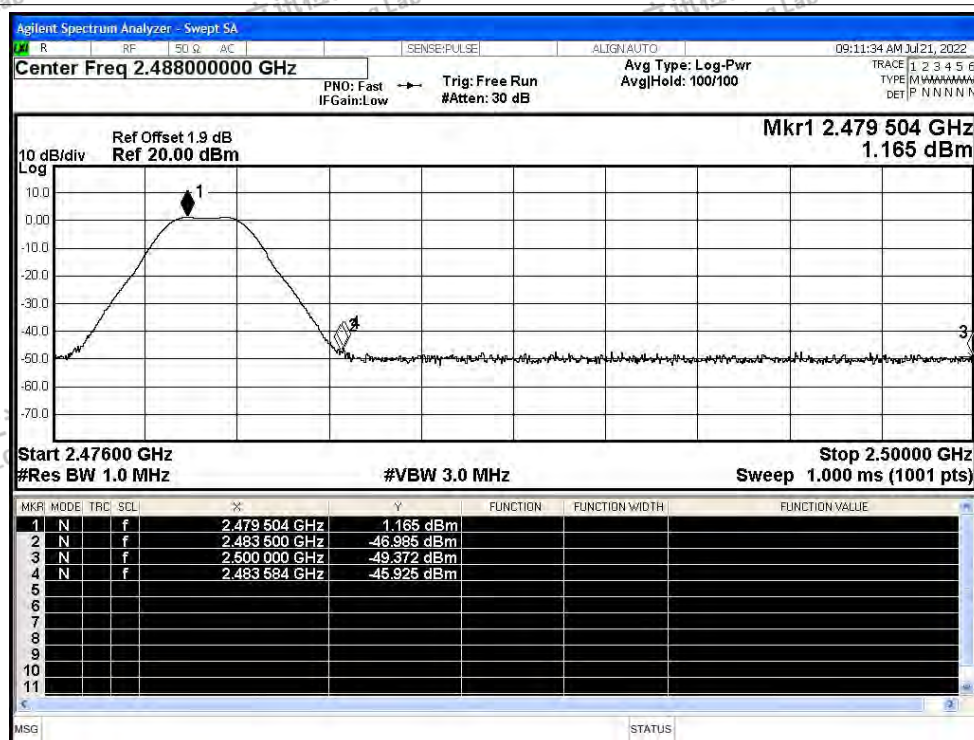
Add: 101, 201 Bldg A &amp; 301 Bldg C, Juji Industrial Park Yabianxueziwei, Shajing Street, Baoan District, Shenzhen, 518000, China

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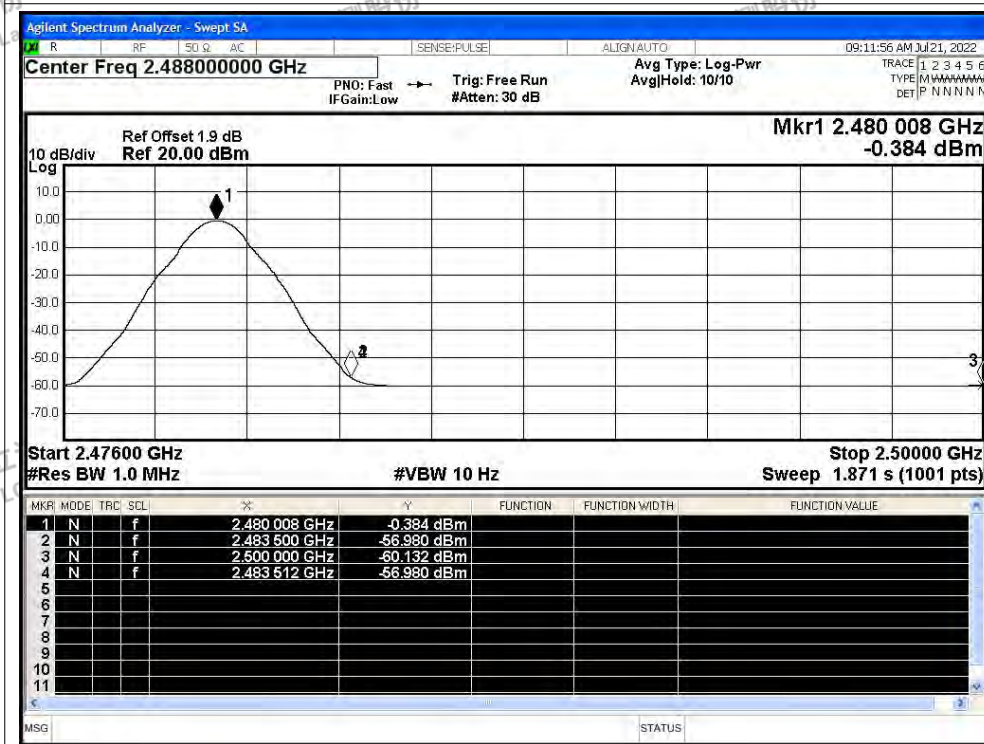
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## Restrict Band NVNT BLE 2M 2480MHz Ant1 Peak



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



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