

# 深圳市晶科鑫实业有限公司

## 样品承认书

|           |                                                                                                                                                                                     |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 客户代码:     |                                                                                                                                                                                     |
| 物料名称:     | 贴片钟振                                                                                                                                                                                |
| 规格型号:     | SMD2520 OSC 20.000MHZ 2.8V LVCMOS -20~70℃                                                                                                                                           |
| P N/ SJK: | 2N20000F28YB                                                                                                                                                                        |
| 环保属性:     | <input checked="" type="checkbox"/> RoHS <input checked="" type="checkbox"/> REACH <input checked="" type="checkbox"/> HF <input type="checkbox"/> PAHS <input type="checkbox"/> 其它 |
| 版 次:      | A1    2017-5-10 初版                                                                                                                                                                  |
| 湿敏等级:     | 一级                                                                                                                                                                                  |

| 承 认 签 章   |                                                                  |     |                 |     |     |
|-----------|------------------------------------------------------------------|-----|-----------------|-----|-----|
| 供 应 商 承 认 |                                                                  |     | (     ) 公 司 承 认 |     |     |
| 制 定       | 审 核                                                              | 核 准 | 工 程 师           | 审 核 | 批 准 |
| 贺丹斌       |                                                                  | 黄灏东 |                 |     |     |
| SJK 支持    | 18682088994 (Mr.黄)                                               |     | 盖章签署            |     |     |
| FAE_EMAIL | <a href="mailto:sjk-fae@q-crystal.com">sjk-fae@q-crystal.com</a> |     | 日 期             |     |     |
| 日 期       |                                                                  |     |                 |     |     |
| 备注：       |                                                                  |     |                 |     |     |

# CRYSTAL OSCILLATOR

**SERIES 2N, SEAM SEALED CERAMIC 2.5X2.0MM SURFACE MOUNT PACKAGE**

## 1. ELECTRICAL SPECIFICATIONS

### Standard atmospheric conditions

Unless otherwise specified, the standard range of atmospheric conditions for making measurement and tests are as follow:

Ambient temperature : 25±5°C

Relative humidity : 40%~70%

If there is any doubt about the results, measurement shall be made within the following limits:

Ambient temperature : 25±3°C

Relative humidity : 40%~70%

### Measure equipment

Electrical characteristics measured by MD 37WX-05M or equivalent.

### Crystal cutting type

The crystal is using AT CUT (thickness shear mode).

|    | Parameters                |                                  | SYM   | Electrical Spec. |      |         |         | Notes               |
|----|---------------------------|----------------------------------|-------|------------------|------|---------|---------|---------------------|
|    |                           |                                  |       | MIN              | TYPE | MAX     | UNITS   |                     |
| 1  | Nominal Frequency         |                                  |       | 20.000000        |      |         | MHZ     |                     |
| 2  | Frequency Stability       | AT 25°C                          |       | ±10              |      |         | PPM     |                     |
|    |                           | Over Operating Temperature range |       | ±10              |      |         | PPM     |                     |
| 3  | Operating Temperature     |                                  | Topr  | -20              | 25   | 70      | °C      |                     |
| 4  | Storage Temperature       |                                  | Tstg  | -55              | ~    | 125     | °C      |                     |
| 5  | Supply Voltage            |                                  | VDD   | 2.8 / ±10%       |      |         | V       | 1.62~3.63 available |
| 6  | Input Current             |                                  | Icc   |                  |      | 5       | mA      |                     |
| 7  | Enable Control            |                                  |       | Yes              |      |         |         | Pad1                |
| 8  | Output Load : CMOS        |                                  | CL    | 15               |      |         | pF      |                     |
| 9  | Output Voltage High       |                                  | VoH   | 90% Vdd          |      |         | V       |                     |
| 10 | Output Voltage Low        |                                  | VoL   |                  |      | 10% Vdd | V       |                     |
| 11 | Rise Time                 |                                  | Tr    |                  |      | 5       | ns      | 10%→ 90%VDD Level   |
| 12 | Fall Time                 |                                  | Tf    |                  |      | 5       | ns      | 90%→ 10%VDD Level   |
| 13 | Symmetry (Duty ratio)     |                                  | TH/T  | 45               | ~    | 55      | %       |                     |
| 14 | Start-up Time             |                                  | Tosc  |                  |      | 10      | ms      |                     |
| 15 | Enable Voltage High       |                                  | Vhi   | 70% Vdd          |      |         | V       |                     |
| 16 | Disable Voltage Low       |                                  | Vlo   |                  |      | 30% Vdd | V       |                     |
| 17 | Aging                     |                                  |       | ±3               |      |         | ppm/yr. | 1st. Year at 25°C   |
| 18 | Output Disable Delay Time |                                  | T off |                  |      | 150     | us      |                     |
| 19 | Output Enable Delay Time  |                                  | T on  |                  |      | 150     | us      |                     |

电话: 0755-88352810-837(Mr.huang) 传真: 0755-88353718 <http://www.q-crystal.com>

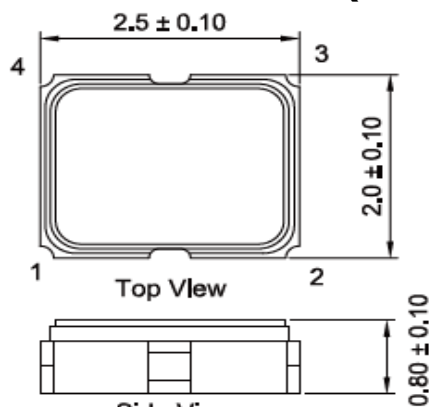
公司地址: 深圳市龙岗区天安云谷产业园一期 3 栋 C 座 12 楼 1204~1206 室

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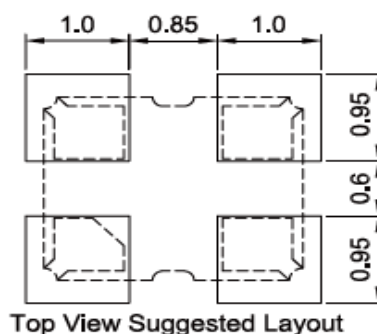
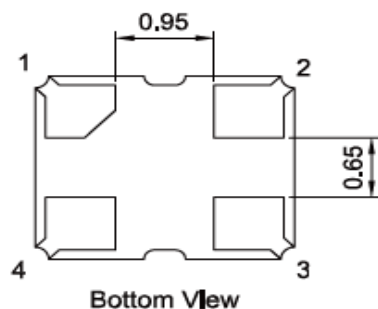
|    |                            |  |  |     |     |    |  |
|----|----------------------------|--|--|-----|-----|----|--|
| 20 | Phase Jitter (12KHZ~20MHZ) |  |  | 0.5 | 1.0 | ps |  |
|----|----------------------------|--|--|-----|-----|----|--|

## 2. DIMENSIONS (Units :mm)

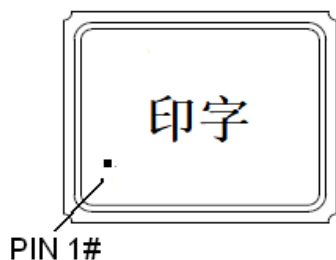


PAD FUNCTION:

- 1: ENABLE CONTROL
- 2: GND
- 3: OUT
- 4: VDD



## 3. MARKING

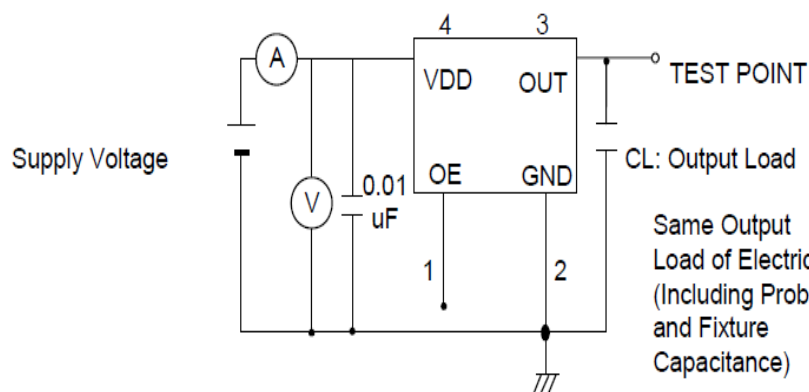


## 4. TEST CIRCUIT

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Control input (output enable/disable)

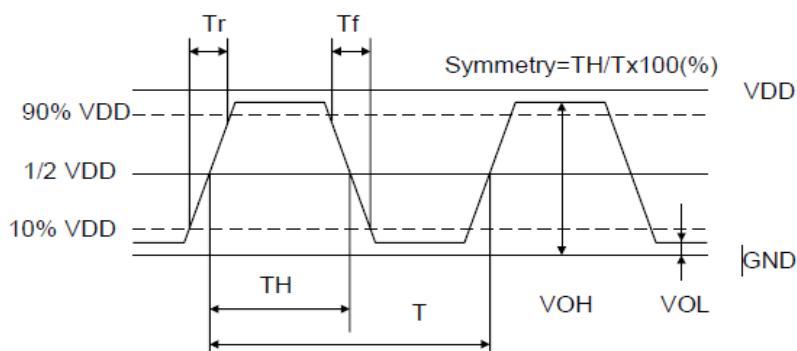
Logic 1 or open on pad 1:

Oscillator output

Logic 0 on pad 1 : Disable output to high impedance

Same Output Load of Electrical Specifications (Including Probe and Fixture Capacitance)

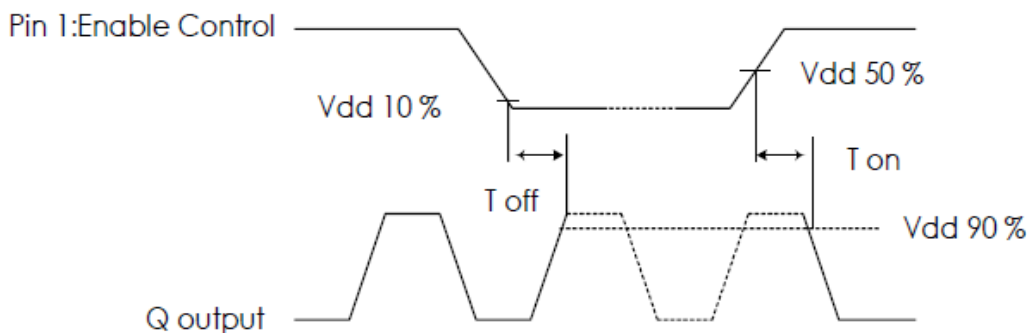
## 5. WAVEFORM CONDITIONS



Waveform measurement system should have a min. bandwidth of 5 times the frequency being tested.

## 6. OUTPUT ENABLE / DISABLE DELAY

The following figure shows the oscillator timing during normal operation . Note that when the device is in standby, the oscillator stops. When standby is released, the oscillator starts and stable oscillator output occurs after a short delay



## 7. SUGGESTED REFLOW PROFILE

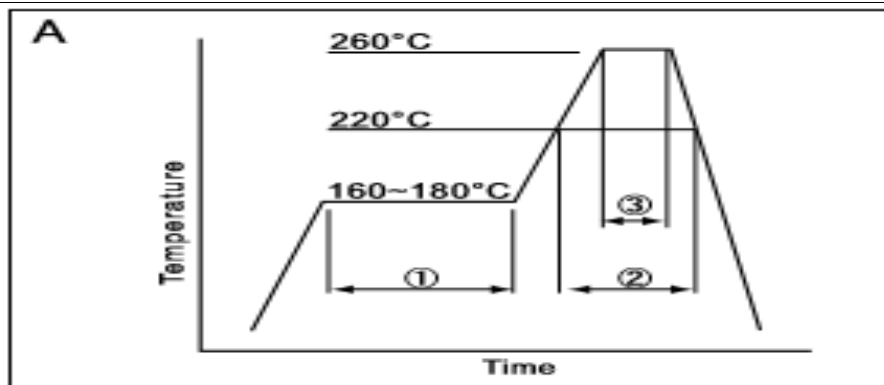
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|   |              |           |            |
|---|--------------|-----------|------------|
| ① | Preheat      | 160~180°C | 120sec.    |
| ② | Primary heat | 220°C     | 60sec.     |
| ③ | Peak         | 260°C     | 10sec. max |

Total time : 200 sec. Max / Solder melting point :220 °C

## 8. RELIABILITY TEST SPECIFICATION

### 1.Mechanical Endurance

| No. | Test Item        | Test Methods                                                                                                                                          | REF. DOC     |
|-----|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| 1   | Drop Test        | 75 cm height,3 times on concrete floor .                                                                                                              | JIS C6701    |
| 2   | Mechanical Shock | Device are shocked to half sine wave ( 1000 G ) three mutually perpendicular axes each 3 times. 0.5m sec. duration time                               | MIL-STD-202F |
| 3   | Vibration        | Frequency range 10 ~ 2000 Hz<br>Amplitude 1.52 mm/20G<br>Sweep time 20 minutes<br>Perpendicular axes each test time 4 Hrs<br>(Total test time 12 Hrs) | MIL-STD-883E |
| 4   | Gross Leak       | Standard Sample For Automatic Gross Leak Detector, Test Pressure: 2kg / cm <sup>2</sup>                                                               | MIL-STD-883E |
| 5   | Fine Leak        | Helium Bomging 4.5 kgf / cm <sup>2</sup> for 2 Hrs                                                                                                    |              |
| 6   | Solderability    | Temperature 245 °C ± 5°C<br>Immersing depth 0.5 mm minimum<br>Immersion time 5 ± 1 seconds<br>Flux Rosin resin methyl alcohol solvent ( 1 : 4 )       | MIL-STD-883E |

### 2.Environmental Endurance

| No. | Test Item                    | Test Methods                                                                                                       | REF. DOC     |
|-----|------------------------------|--------------------------------------------------------------------------------------------------------------------|--------------|
| 1   | Resistance To Soldering Heat | Pre-heat temperature 125 °C<br>Pre-heat time 60 ~ 120 sec.<br>Test temperature 260 ± 5 °C<br>Test time 10 ± 1 sec. | MIL-STD-202F |
| 2   | High Temp. Storage           | + 125 °C ± 3 °C for 1000 ± 12 Hrs                                                                                  | MIL-STD-883E |
| 3   | Low Temp. Storage            | - 40 °C ± 3 °C for 1000 ± 12 Hrs                                                                                   |              |

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|    |                         |                                                                                                                                                                          |              |
|----|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| 4  | Thermal Shock           | <p>Total 100 cycles of the following temperature cycle</p> <p>1 cycle</p> <p>125 ± 3 °C</p> <p>25 °C</p> <p>-55 ± 3 °C</p> <p>10 min</p> <p>10 min</p> <p>10 min max</p> | MIL-STD-883E |
| 5  | Pressure Cooker Storage | 121 ± 3 °C , RH100% , 2 bar , 240 Hrs                                                                                                                                    | JIS C6701    |
| 6  | High Temp & Humidity    | 85 °C ± 3 °C , RH 85% , 1000 Hrs                                                                                                                                         | JIS C5023    |
| 备注 |                         |                                                                                                                                                                          |              |