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|----|---------------|
| 编号 | SCTF2022LC929 |
| 日期 | 2022/9/1      |
| 版本 | B01           |

# 承认书

## SPECIFICATION FOR APPROVAL

|                       |                        |
|-----------------------|------------------------|
| 客户名称 Customer Name:   | 立创商城                   |
| 供应商物料名称 Part Name:    | 石英晶体振荡器                |
| 产品描述 Description:     | SMD5032 16.000MHz/3.3V |
| 供应商物料料号 Part NO.:     | S5D16.000000B20F30T    |
| 供应商名称 Supplier Name : | 深圳市星通时频电子有限公司          |

PLEASE CONFIRM OUR SPECIFICATION. 敬请确认规格书之内容。

| CUSTOMER APPROVAL 客户审批     |     |     |
|----------------------------|-----|-----|
| 物料代号 PART NO. _____        |     |     |
| 使用于机型 USED IN MODEL: _____ |     |     |
| 工程部                        | 品质部 | 采购部 |
|                            |     |     |

(敬请承认后返回一份, 谢谢!)

| SUPPLIER APPROVAL 供应商审批 |         |             |
|-------------------------|---------|-------------|
| DGN.制表人                 | CKD. 校对 | APPD. 审核、签章 |
| 吴丽红                     | 李霞      | 胡华才         |

地址: 深圳市南山区龙珠四路方大城T2栋10楼

Add: 10 / F, Building T2, Fangdacheng, Longzhu 4th Road, Nanshan District, Shenzhen, China.

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Email: info@sctf-crystal.com

TEL: 0755-86097430

FAX: 0755-86097259

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■ Electrical Specification 电气参数

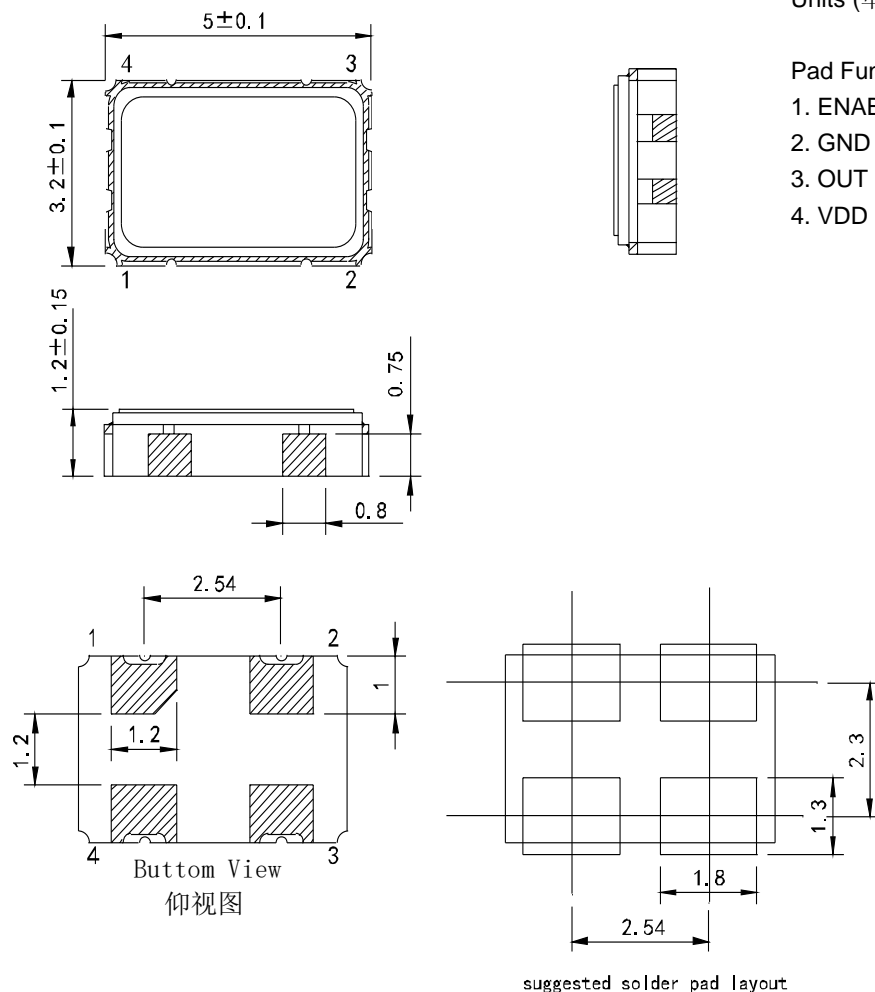
| N0. | Item                                   | Electrical Spec. | Notes  |
|-----|--|------------------|--|
| 1   | Holder Type<br>封装                      | SMD5032          |  |
| 2   | Nominal Frequency<br>标称频率              | 16.000000 MHz    |  |
| 3   | Frequency stability<br>常温频差            | ±20PPM           | at 25°C±2°C  |
| 4   | Temperature Drift<br>温度频差              | ±30PPM           | at -40~85°C  |
| 5   | Operating voltage<br>工作电压              | 3.3V             | ±10% max.  |
| 6   | Output<br>输出模式                         | CMOS             |  |
| 7   | Output load condition<br>负载            | 15pF             |  |
| 8   | Current consumption<br>消耗电流            | 10 mA max.       |  |
| 9   | Operating temperature range<br>工作温度范围  | -40~85°C         |  |
| 10  | Storage Temperature Range<br>存储温度范围    | -55~125°C        |  |
| 11  | Duty Cycle<br>占空比                      | 45%-55%          |  |
| 12  | Rise / Fall Time<br>上升/下降沿时间           | 5 nS max.        |  |
| 13  | High output voltage<br>高电平             | 0.9Vdd min.      |  |
| 14  | Low output voltage<br>低电平              | 0.1Vdd max.      |  |
| 15  | Start-up Time<br>起振时间                  | 5mS max.         | To 90% of Final Amplitude  |
| 16  | Enable Voltage High (Logic 1)<br>使能高电平 | 70%VDD min.      | Output will be enable if OE is Logic 1 or open ;<br>Output will be disable if OE is Logic 0.<br>输出使能OE是高电平1或者悬空，频率输出；<br>输出使能OE是低电平0，则无频率输出。 |
| 17  | Enable Voltage Low (Logic 0)<br>使能低电平  | 30%VDD max.      |  |
| 18  | Enable Delay Time<br>使能延迟              | 150 uS max..     |  |
| 19  | Aging<br>老化                            | ±3ppm            | 1st. Year at 25°C  |

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## ■ DIMENSIONS 产品尺寸

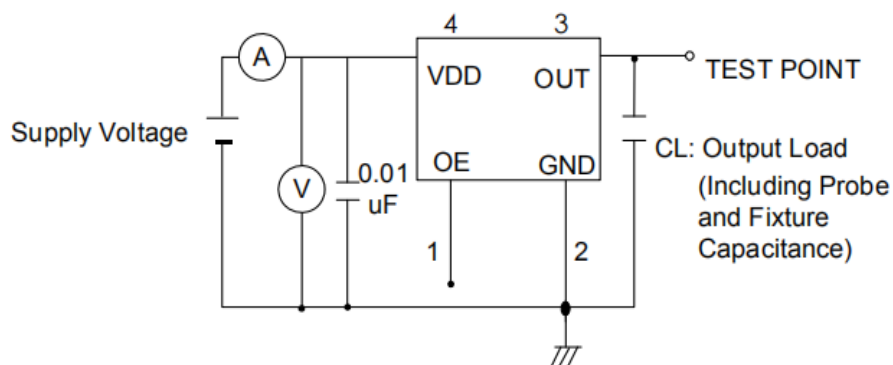
Units (单位): mm(毫米)



Pad Functions:

1. ENABLE CONTROL
2. GND
3. OUT PUT
4. VDD

## ■ TESTING CIRCUIT 测试电路



※ Notes: PIN 1 connected to Vdd or floating, the product is working properly; connected to GND, stops working.

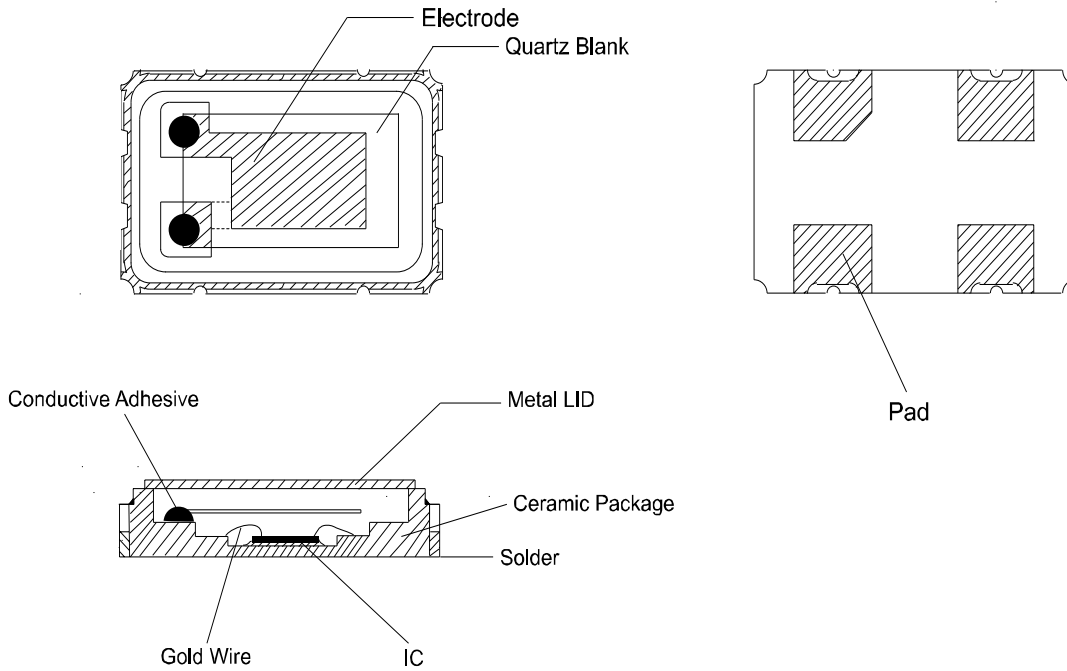
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■ **WAVEFORM CONDITIONS** 输出波形

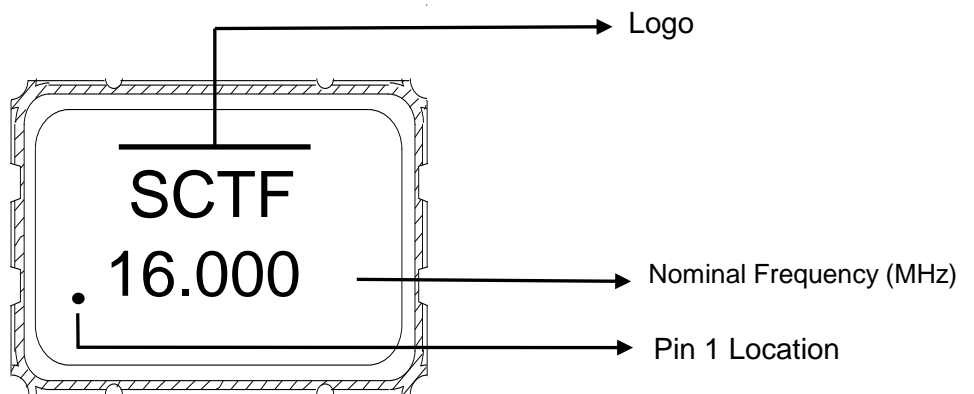


Waveform measurement system should have a min. bandwidth of 5 times the frequency being tested.

■ **Product Structure** 产品结构



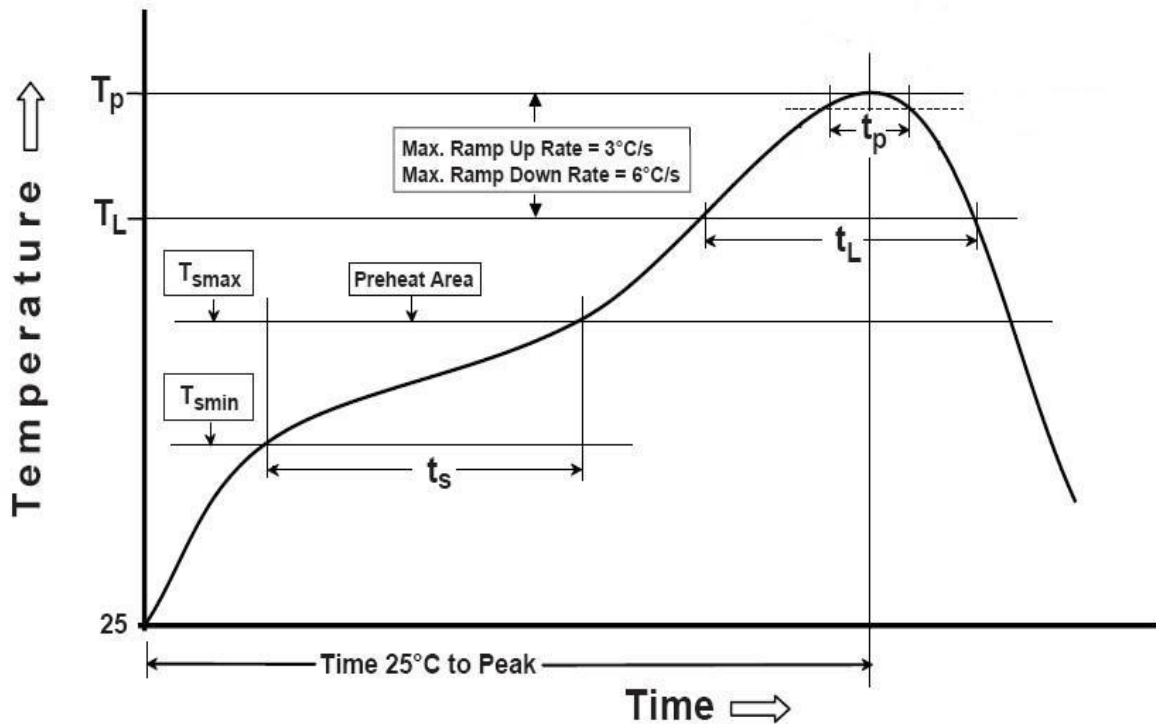
■ **Marking** 印字



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## REFLOW PROFILES 回流焊条件

| Profile Feature   | Sn-Pb Eutectic Assembly | Pb-Free Assembly |
|---|-------------------------|------------------|
| Preheat/Soak  |                         |                  |
| ● Temperature Min (Ts min)  | 100 °C                  | 150 °C           |
| ● Temperature Max (Ts max)  | 150 °C                  | 200 °C           |
| ● Time (Ts min to Ts max)   | 60-120 seconds          | 60-120 seconds   |
| Ramp-up rate (TL to Tp)   | 3 °C/second max.        | 3 °C/second max. |
| Time maintained above   |                         |                  |
| ● Liquidous temperature (TL)                                      | 183 °C                  | 217 °C           |
| ● Time (tL) maintained above TL                                   | 60-150 seconds          | 60-150 seconds   |
| Peak package body temperature (Tp)                                | 235 °C                  | 260 °C           |
| Time within 5 °C of the specified classification temperature (Tp) | 20 seconds              | 30 seconds       |
| Ramp-down rate (Tp to TL)   | 6 °C/second max.        | 6 °C/second max. |
| Time 25 °C to peak temperature                                    | 6 minutes max.          | 8 minutes max.   |
| <b>Suggest reflow times</b>                                       | <b>3 Times max.</b>     |                  |



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## ■ RELIABILITY SPECIFICATION 可靠性参数

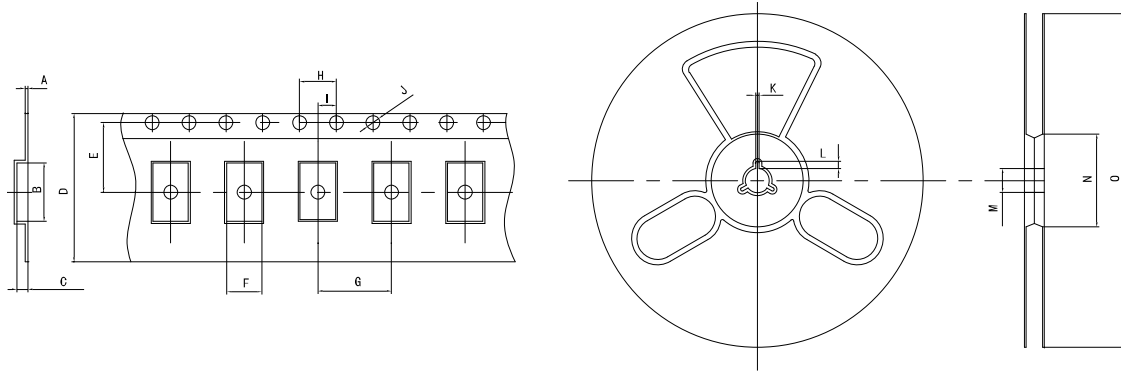
| 序号<br>NO. | 项目<br>ITEM                | 条件<br>CONDITIONS   | 合格标准<br>BASIS OF VERDICT                                    |
|-----------|---------------------------|--|---|
| 1         | 跌落<br>DROP                | 100cm高处自由跌落到3cm厚木板上,3次<br>High:100cm;Thickness:3cm;3 times.  | $\Delta FL \leq \pm 5 \text{ppm}$                           |
| 2         | 振动<br>VIBRATION           | 频率 Frequency:10~57.7Hz:幅度 Amplitude: $\pm 0.75 \text{mm}$<br>频率Frequency:57.7Hz~500Hz:加速度幅度acceleration rate:98m/s <sup>2</sup><br>周期 Cycle time:10-500-10Hz: 15min<br>振动方向 Direction:X,Y, Z<br>振动时间 Duration: 每个方向2小时 2 h/direction.                  | $\Delta FL \leq \pm 5 \text{ppm}$                           |
| 3         | 温度变化<br>TEMPERATURE SHOCK | -40°C $\pm 2$ °C (30min) $\leftrightarrow$ 85°C $\pm 2$ °C (30min);循环10次<br>-40°C $\pm 2$ °C (30min) $\leftrightarrow$ 85°C $\pm 2$ °C (30min);For 10 cycles   | $\Delta FL \leq \pm 5 \text{ppm}$                           |
| 4         | 湿热<br>HUMIDITY            | 温度:40°C $\pm 2$ °C;湿度90-95%;时间:96小时<br>Temp:40°C $\pm 2$ °C;Humidity:90-95%;Times:96h  | $\Delta FL \leq \pm 5 \text{ppm}$                           |
| 5         | 低温<br>COLD RESISTANCE     | 温度:-40°C $\pm 2$ °C;时间:96小时<br>Temp:-40°C $\pm 2$ °C;Times:96h   | $\Delta FL \leq \pm 5 \text{ppm}$                           |
| 6         | 高温1<br>HEAT RESISTANCE 1  | 温度:100°C $\pm 2$ °C;时间:96小时<br>Temp:100°C $\pm 2$ °C;Times:96h   | $\Delta FL \leq \pm 5 \text{ppm}$                           |
| 7         | 高温2<br>HEAT RESISTANCE 2  | 温度:155°C $\pm 2$ °C;时间:2小时<br>Temp:155°C $\pm 2$ °C;Times:2h   | $\Delta FL \leq \pm 5 \text{ppm}$                           |
| 8         | 高温3<br>HEAT RESISTANCE 3  | 温度:85°C $\pm 2$ °C;电压:3.3V/5.0V;时间:96小时<br>Temp:85°C $\pm 2$ °C;Voltage:3.3V/5.0V;Times:96h  | $\Delta FL \leq \pm 5 \text{ppm}$                           |
| 9         | 回流焊<br>REFLOW             | 150°C $\pm 5$ °C保持120s后升到270°C $\pm 5$ °C保持10s, 升温 and 保温时间小于200s, 常温放置1~2h后测定<br>Keep 150 °C $\pm$ 5 °C 120s and then rose to 270 °C $\pm$ 5 °C for 10s, warming and holding time is less than the 200s, placed at room temperature 1 ~ 2h after test | $\Delta FL \leq \pm 5 \text{ppm}$                           |
| 10        | 盐雾<br>SALT SPRAY          | 盐雾浓度:5%;温度:35°C;时间:24小时<br>Salt density:5%;Temp:35°C;Times:24h   | 目测无明显腐蚀现象<br>Visual no significant corrosion.               |
| 11        | 老化<br>AGING               | 温度:85°C;时间:30天<br>Temp:85°C;Times:30days   | $\Delta FL \leq \pm 5 \text{ppm}$                           |
| 12        | 气密性<br>LEAKAGE            | 氦气(0.6~0.65MPa):10分钟<br>He(0.6~0.65MPa):10min  | $\leq 3 \times 10^{-9} \text{Pa} \cdot \text{m}^3/\text{s}$ |
| 13        | 焊接<br>SOLDER              | 温度:260°C $\pm 5$ °C<br>Temp:260°C $\pm 5$ °C   | 浸锡率大于90%<br>Soldering tin rate greater than 90%             |

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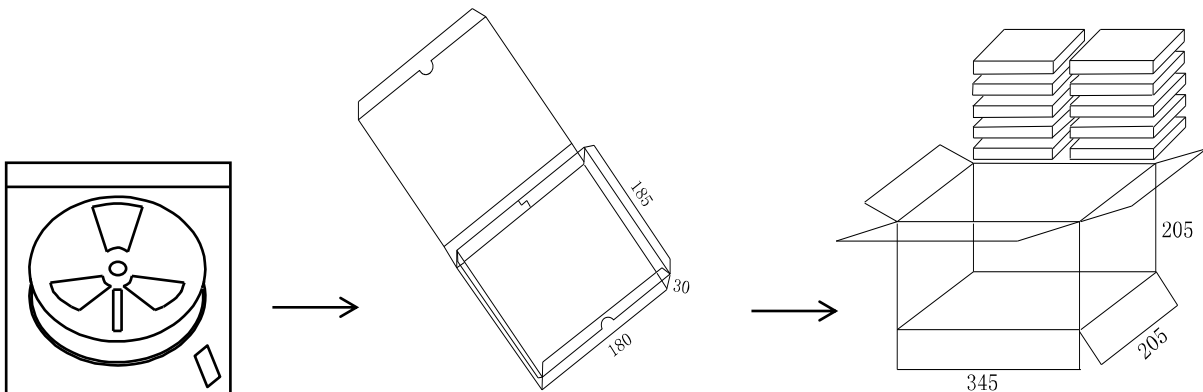
### ◆ Taping Specifications 编带参数

UNIT (单位): mm (毫米)



| TEYE      | A    | B    | C    | D     | E    | F    | G    | H    | I    | J    | K    | L    | M     | N     | O      |
|-----------|------|------|------|-------|------|------|------|------|------|------|------|------|-------|-------|--------|
| 5×3.2 SMD | 0.30 | 7.50 | 1.50 | 12.00 | 5.50 | 3.70 | 8.00 | 4.00 | 2.00 | 1.50 | 2.00 | 4.00 | 13.00 | 60.00 | 180.00 |

### ◆ Packaging specifications 包装参数



自封袋 (Bag)  
1000只 = 1 轮  
1000pcs = 1 Reel

内包装 (Inside package)  
1 轮 = 1 盒  
1 Reel = 1 box

外包装 (Outside Package)  
10 盒 = 1 箱  
10 box = 1 carton

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