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|----|---------------|
| 编号 | SCTF2022LCC03 |
| 日期 | 2022-6-9      |
| 版本 | A02           |

# 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:    | 石英晶体谐振器                 |
| 产品描述 Description:     | DTF3215 32.768KHz/7.0pF |
| 供应商物料料号 Part NO.:     | DXTF321532768C20F       |
| 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                     | 李良      | 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.

Website: www.sctf-crystal.com

Email: info@sctf-crystal.com

TEL: 0755-86097430

FAX: 0755-86097259



## ■ QUARTZ CRYSTAL UNIT SPECIFICATION

Crystal Unit Spec:

| NO. | Item                                   | Symb. | Electrical spec.     | Notes   |
|-----|--|-------|----------------------|---|
| 1   | Product Type<br>产品型号                   | -     | DTF3215              |   |
| 2   | Nominal Frequency<br>标称频率              | f     | 32.768kHz            |   |
| 3   | Operating Temperature<br>工作温度范围        | T_use | -40~85℃              |   |
| 4   | Storage Temperature Range<br>存储温度      | T_stg | -55~125℃             |   |
| 5   | Oscillation Mode<br>振荡模式               | -     | Fundamental          |   |
| 6   | Frequency Tolerance<br>常温频差            | f_tol | ±20PPM               | at 25℃±3℃                                     |
| 7   | Turnover Temperature<br>拐点温度           | Ti    | 25℃±5℃               |   |
| 8   | Parabolic curvature constant<br>频率温度系数 | B     | -0.042 PPM/(Δ℃)² MAX | Over Operating Temp. Range<br>(Reference 25℃) |
| 9   | Drive Level<br>激励功率                    | DL    | 0.5 μW Max.          | See the 2.1                                   |
| 10  | Load Capacitance<br>负载电容               | CL    | 7.0pF                | See the 2.2                                   |
| 11  | Effective Resistance Rr<br>谐振电阻        | RR    | 70kΩ Max.            |   |
| 12  | Motional Capacitance C1<br>动态电容        | C1    | 4.65fF Tye.          |   |
| 13  | Shunt Capacitance C0<br>静电容            | CO    | 1.15 pF Tye.         |   |
| 14  | Quality Factor<br>品质因素                 | Q     | 13000 Min            |   |
| 15  | Aging<br>年老化率                          | f_age | ±3 ppm               | 25℃, 1st Year                                 |
| 16  | Others其他                               | ROHS  |                      |   |

Notes:

2.1 Drive Level (DL)

0.5 μW Max.

(If Drive Level is too high, that may cause crystal resonator abnormal oscillation or damaged the main body of quartz.)

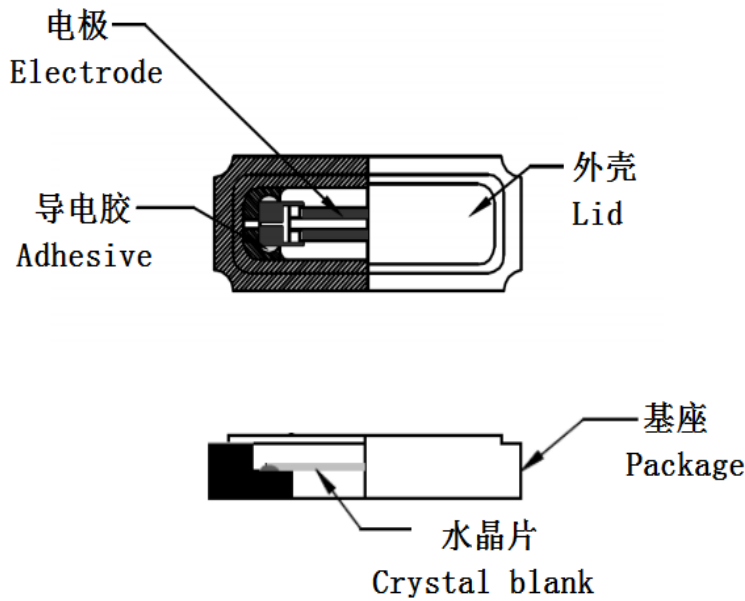
2.2 Loading capacitance (CL) : 7.0pF

(The total circuit load capacitance should be equal to the crystal (CL) values, too large or too small load, will result in frequency drift.)

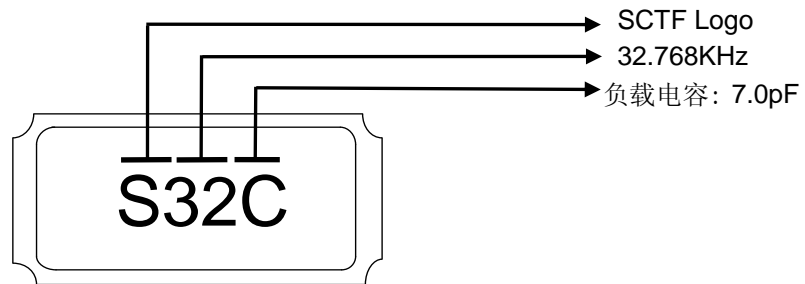
| SHENZHEN SCTF ELECTRONICS CO. , LTD |   |       |
|-------------------------------------|---|-------|
| DATE                                | Specification of quartz crystal<br>石英晶体谐振器规格书     | Page: |
| 2022-6-9                            | P/N: DXTF321532768C20F<br>Spec.NO.: SCTF2022LCC03 | 3     |

## ■ PRODUCT STRUCTURE & MARKING

### ◆ Product Structure 产品结构



### ◆ Marking 印字



#### 1. 超声波清洗或者焊接 Ultrasonic cleaning or welding

恶劣的超声波清洗或超声波焊接可能会影响和损坏石英晶体元件。如果您对晶体元件进行了超声波清洗，请一定在使用前确认晶体元件是否受到了影响和损坏。

Crystal units may be affected and destroyed at worst by supersonic cleaning or supersonic welding. Please be sure to check if your cleaning and welding process affects any damage to crystal units before using.

#### 2. 手工焊建议条件 Recommended conditions for manual welding

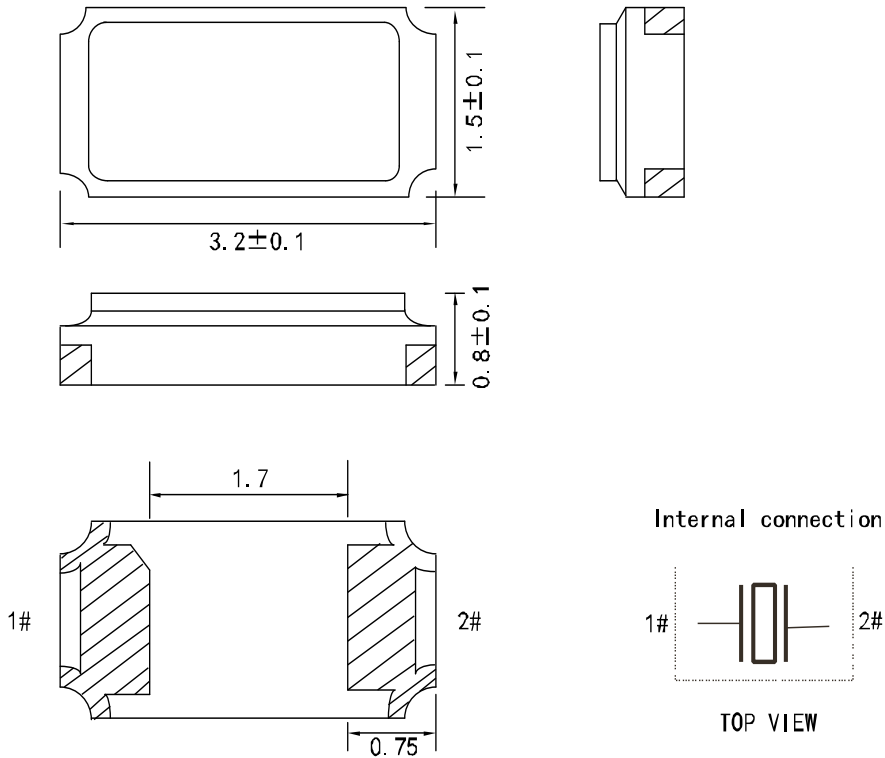
温度:  $350 \pm 10^\circ\text{C}$ , 时间: 3 秒 Max, 次数: 2 次 Max. Temperature:  $350 \pm 10^\circ\text{C}$ , Time: 3 sec max, Re-solder times: twice max.

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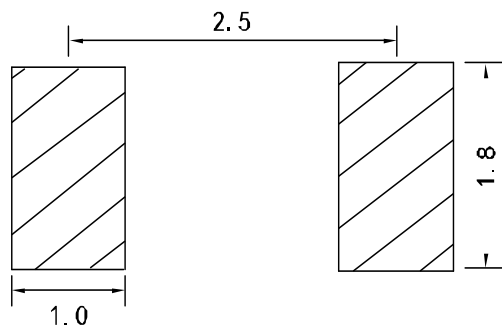
## ■ DIMENSIONS

产品尺寸 (Product size)

Units (单位): mm(毫米)



焊盘尺寸 (Pad size)



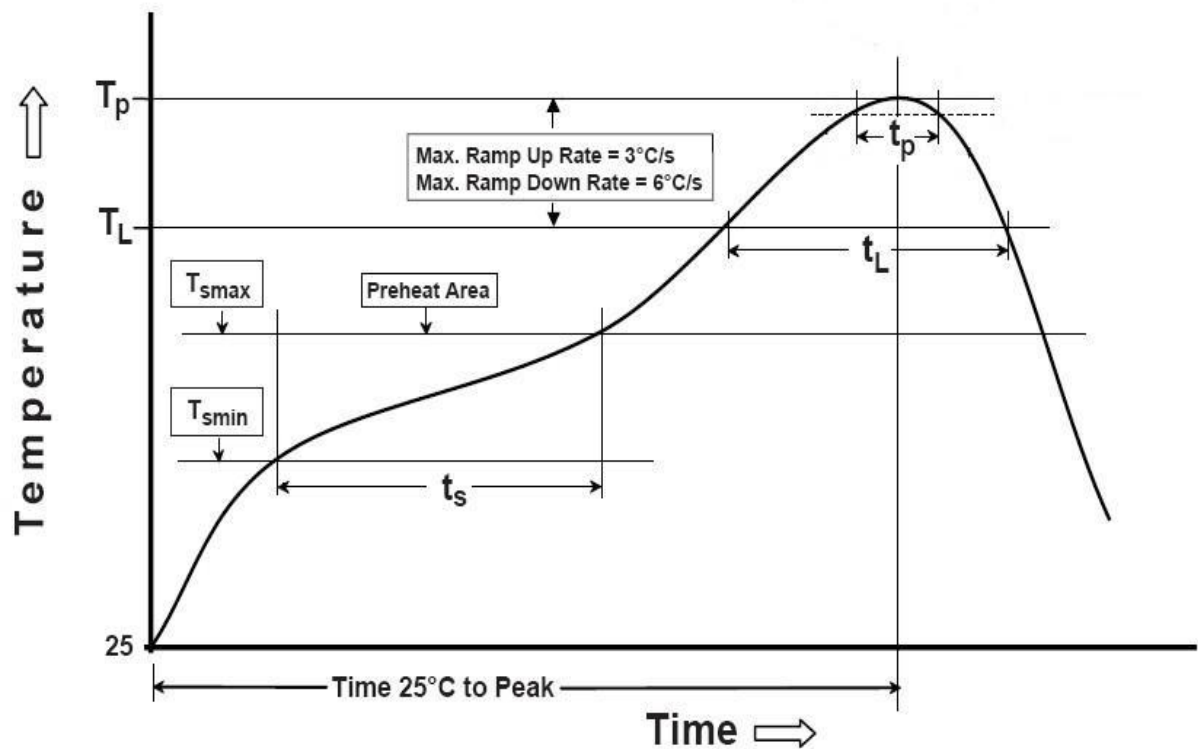
suggested solder pad layout

\*建议勿在晶体底部设计信号线。

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## REFLOW PROFILES

| Profile Feature  | Sn-Pb Eutectic Assembly | Pb-Free Assembly |
|--|-------------------------|------------------|
| Preheat/Soak   |                         |                  |
| ● Temperature Min ( $T_s$ min)   | 100 °C                  | 150 °C           |
| ● Temperature Max ( $T_s$ max)   | 150 °C                  | 200 °C           |
| ● Time ( $T_s$ min to $T_s$ max)                                       | 60-120 seconds          | 60-120 seconds   |
| Ramp-up rate ( $T_L$ to $T_p$ )  | 3 °C/second max.        | 3 °C/second max. |
| Time maintained above  |                         |                  |
| ● Liquidous temperature ( $T_L$ )                                      | 183 °C                  | 217 °C           |
| ● Time ( $t_L$ ) maintained above $T_L$                                | 60-150 seconds          | 60-150 seconds   |
| Peak package body temperature ( $T_p$ )                                | 235 °C                  | 260 °C           |
| Time within 5 °C of the specified classification temperature ( $T_p$ ) | 20 seconds              | 30 seconds       |
| Ramp-down rate ( $T_p$ to $T_L$ )                                      | 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>2 Times max.</b>     |                  |



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## RELIABILITY SPECIFICATION

| 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                             | 150cm高处自由跌落到水泥地板上,3次<br>High:150cm;cement floor;3 times.   | $\Delta FL \leq \pm 20 \text{ppm}$<br>$\Delta RR \leq RR(\text{max}) * 10\%$ |
| 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<br>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.   | $\Delta FL \leq \pm 10 \text{ppm}$<br>$\Delta RR \leq RR(\text{max}) * 10\%$ |
| 3         | 温度变化<br>TEMPERATURE SHOCK              | -40°C $\pm 2^\circ\text{C}$ (30min) $\leftrightarrow$ 85°C $\pm 2^\circ\text{C}$ (30min);循环10次<br>-40°C $\pm 2^\circ\text{C}$ (30min) $\leftrightarrow$ 85°C $\pm 2^\circ\text{C}$ (30min);For 10 cycles   | $\Delta FL \leq \pm 10 \text{ppm}$<br>$\Delta RR \leq RR(\text{max}) * 10\%$ |
| 4         | 湿热<br>HUMIDITY                         | 温度:40°C $\pm 2^\circ\text{C}$ ;湿度90-95%;时间:96小时<br>Temp:40°C $\pm 2^\circ\text{C}$ ;Humidity:90-95%;Times:96h  | $\Delta FL \leq \pm 10 \text{ppm}$<br>$\Delta RR \leq RR(\text{max}) * 10\%$ |
| 5         | 低温<br>COLD RESISTANCE                  | 温度:-40°C $\pm 2^\circ\text{C}$ ;时间:96小时<br>Temp:-40°C $\pm 2^\circ\text{C}$ ;Times:96h   | $\Delta FL \leq \pm 10 \text{ppm}$<br>$\Delta RR \leq RR(\text{max}) * 10\%$ |
| 6         | 高温<br>HEAT RESISTANCE 1                | 温度:125°C $\pm 2^\circ\text{C}$ ;时间:96小时<br>Temp:125°C $\pm 2^\circ\text{C}$ ;Times:96h   | $\Delta FL \leq \pm 10 \text{ppm}$<br>$\Delta RR \leq RR(\text{max}) * 10\%$ |
| 7         | 回流焊<br>REFLOW                          | 150°C $\pm 5^\circ\text{C}$ 保持120s后升到260°C $\pm 5^\circ\text{C}$ 保持10s, 升温和保温<br>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 260 °C $\pm$ 5 °C for<br>10s, warming and holding time is less than the 200s, placed<br>at room temperature 1 ~ 2h after test | $\Delta FL \leq \pm 20 \text{ppm}$<br>$\Delta RR \leq RR(\text{max}) * 10\%$ |
| 8         | 老化<br>AGING                            | 温度:85°C;时间:30天<br>Temp:85°C;Times:30days   | $\Delta FL \leq \pm 5 \text{ppm}$<br>$\Delta RR \leq RR(\text{max}) * 10\%$  |
| 9         | 气密性<br>LEAKAGE                         | 氦气(0.6~0.65MPa):10分钟<br>He(0.6~0.65MPa):10min  | $\leq 3 * 10^{-9} \text{Pa} \cdot \text{m}^3/\text{s}$                       |
| 10        | 焊接<br>SOLDER                           | 温度:235°C $\pm 5^\circ\text{C}$<br>Temp:235°C $\pm 5^\circ\text{C}$   | 浸锡率大于90%<br>Soldering tin rate<br>greater than 90%                           |
| 11        | 折板弯曲试验<br>TERMINAL STRENGTH            | 弯曲度: 3mm,保持时间: 5sec,速度: 0.5mm/sec<br>Bending: 3mm, Hold time: 5sec, Speed: 0.5mm/sec   | $\Delta FL \leq \pm 20 \text{ppm}$<br>$\Delta RR \leq RR(\text{max}) * 10\%$ |
| 12        | 折板推力试验<br>STICKING TENDENCY            | 荷重: 10N, 保持时间: 10 秒, 治具: R0.5(制品侧边位置)<br>Load: 10N, Hold time: 10 seconds, Fixture: R0.5 (product<br>side position)  | $\Delta FL \leq \pm 20 \text{ppm}$<br>$\Delta RR \leq RR(\text{max}) * 10\%$ |
| 13        | 本体荷重试验<br>ELEMENT ASSEMBLY<br>STRENGTH | 荷重: 10N, 保持时间: 10 秒, 治具: R0.5(制品中心位置)<br>Load: 10N, Hold time: 10 seconds, Fixture: R0.5 (product<br>center position)  | $\Delta FL \leq \pm 20 \text{ppm}$<br>$\Delta RR \leq RR(\text{max}) * 10\%$ |

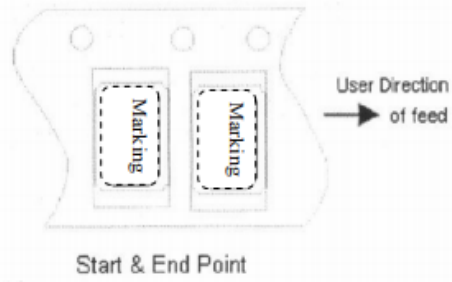
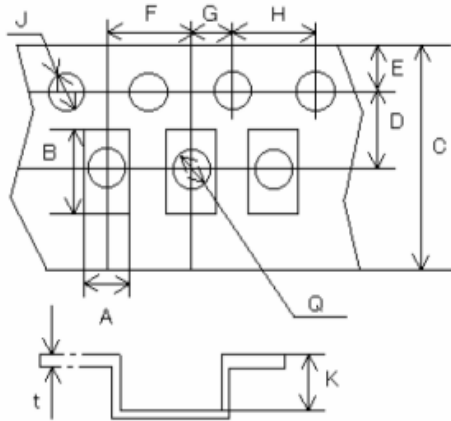
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# PACKAGE

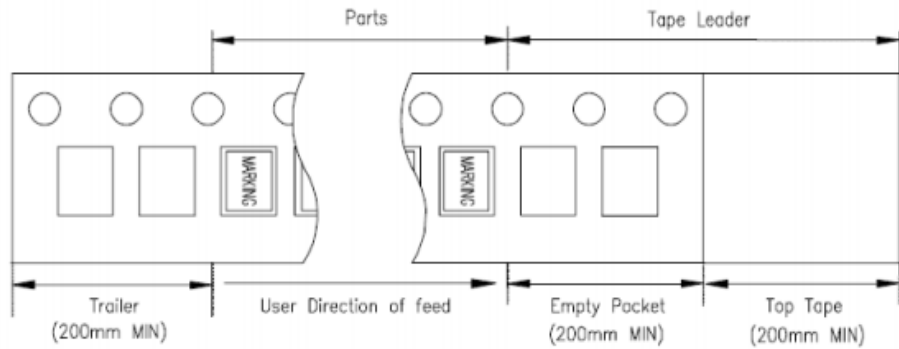
Units (单位): mm(毫米)

## ◆ Tape dimensions

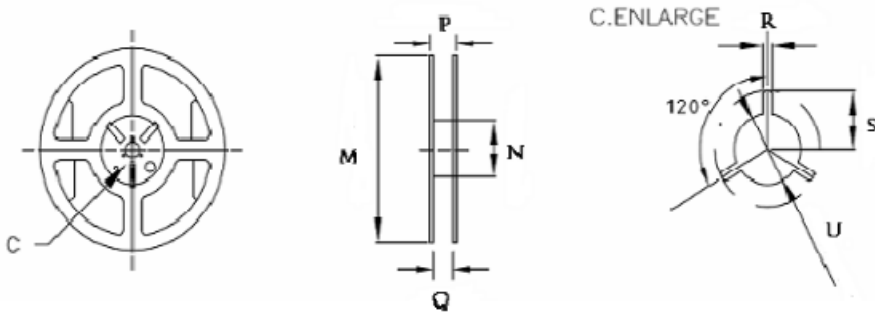


| A    | B    | C    | D   | E    | F   | G   | H   | J   | K   | t    |
|------|------|------|-----|------|-----|-----|-----|-----|-----|------|
| 1.75 | 3.45 | 12.0 | 5.5 | 1.75 | 4.0 | 2.0 | 4.0 | 1.5 | 1.0 | 0.25 |

## 备注 REMARK:



## ◆ Real dimensions



| M   | N  | P    | Q    | R   | S    | U    |
|-----|----|------|------|-----|------|------|
| 180 | 60 | 17.5 | 13.5 | 3.2 | 10.5 | 13.0 |

圆卷 Reel: 3000 pcs/Reel

## Notes:

储存温度说明 Storage temperature description

储存温度仅适用于产品, 而包装材料储存温度 5°C~40°C。

Storage Temperature is only for the product itself, the temperature for the packing material is 5°C~40°C.

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