

|    |               |
|----|---------------|
| 编号 | SCTF202305319 |
| 日期 | 2023/5/22     |
| 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:    | 石英晶体谐振器               |
| 产品描述 Description:     | SMD1612 37.400MHz/8pF |
| 供应商物料料号 Part NO.:     | SX0B37.400F0810F30    |
| 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         |



## ■ QUARTZ CRYSTAL UNIT SPECIFICATION

### 1. Crystal Unit Spec:

| N0. | Item                              | Symb.  | Electrical Spec.              | Notes  |
|-----|-----------------------------------|--|-------------------------------|--|
| 1   | Nominal Frequency<br>标称频率         | f  | 37.400000 MHz                 |  |
| 2   | Oscillation Mode<br>振荡模式          |  | AT Fundamental                |  |
| 3   | Holder Type<br>封装                 |  | SMD1612                       |  |
| 4   | Frequency Tolerance<br>常温频差       | $\Delta f/f$   | $\pm 10\text{ppm}$            | at $25^{\circ}\text{C}\pm 2^{\circ}\text{C}$                 |
| 5   | Drive Level<br>激励功率               | DL   | 10 $\mu\text{W}$ Typical      | See the 2.1  |
| 6   | Load Capacitance<br>负载电容          | CL   | 8pF                           | See the 2.2  |
| 7   | Effective Resistance<br>谐振电阻      | RR   | 80 $\Omega$ max.              | See the 2.3  |
| 8   | Shunt Capacitance<br>静电容          | C0   | 3 pF Max.                     |  |
| 9   | Drive Level Dependency<br>激励功率依赖性 | DLD2   | 20 $\Omega$ max.              | Sweep from 100nW to 100uW in 20 steps.                       |
| 10  | Temperature Drift<br>温度频差         | f_tem  | $\pm 30\text{ppm}$            | Over Operating Temp. Range (Reference $25^{\circ}\text{C}$ ) |
| 11  | Spurious response<br>寄生响应         | SPDB   | -3dB max.                     | Start -1000ppm stop 5000ppm 30 steps power applied: 10dBm    |
| 12  | Operating Temperature<br>工作温度范围   | T_use  | $-40\sim 85^{\circ}\text{C}$  |  |
| 13  | Storage Temperature Range<br>存储温度 | T_stg  | $-55\sim 125^{\circ}\text{C}$ |  |
| 14  | Insulation Resistance<br>绝缘阻抗     | IR   | 500 M $\Omega$                | at DC 100V   |
| 15  | Aging<br>老化率                      | f_age  | $\pm 3\text{ppm}$             | 1st Year   |
| 16  | Measurement Condition<br>测量条件     | Measured by S&A250B or equivalen, TA= $25^{\circ}\text{C}\pm 2^{\circ}\text{C}$ , RH=40%~70% |                               |  |

### 2. Circuit Conditions Spec:

2.1 Drive Level (DL) 100 $\mu\text{W}$  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) : 8pF

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

2.3 Negative Resistance (-R)  $\geq 400\Omega$

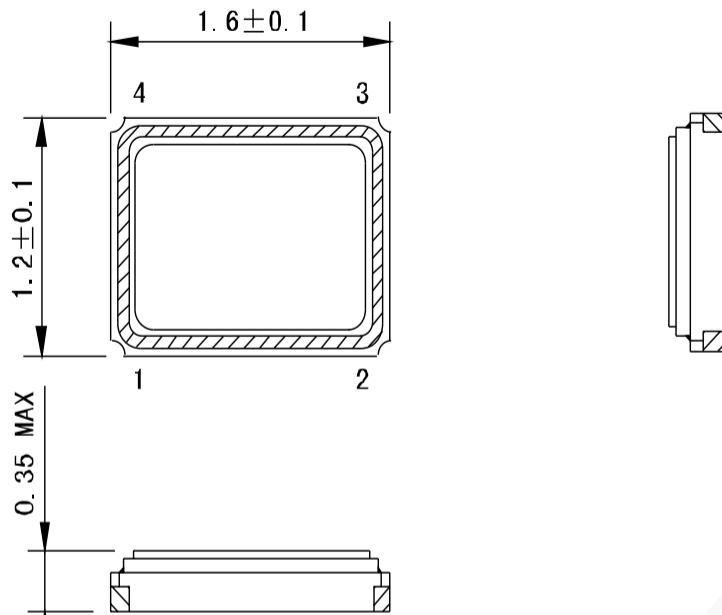
(If -R more than ESR spec of 5 times will be better. If Negative Resistance is too low, that may cause crystal resonator stop oscillation or not easy to oscillate)

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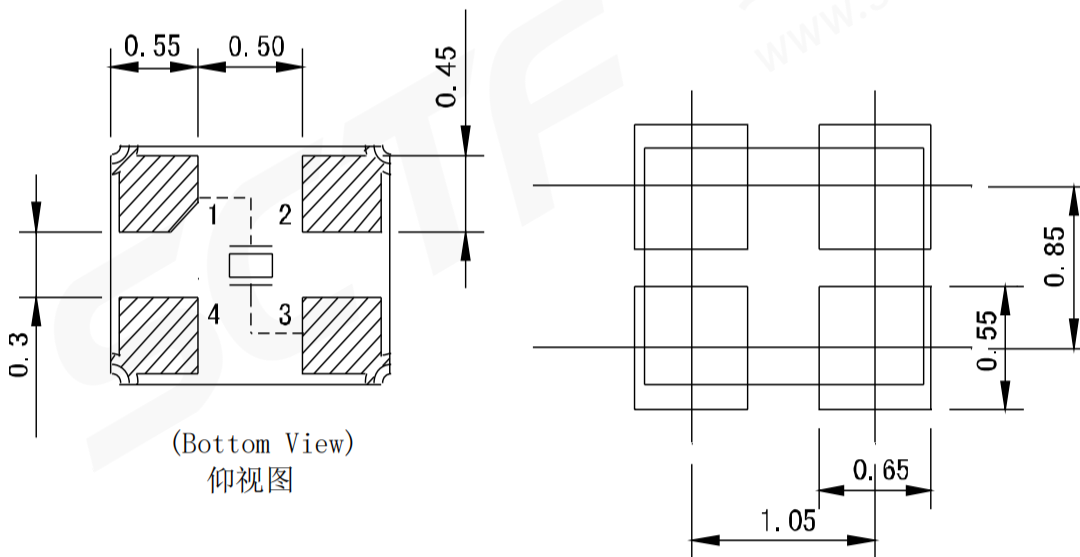
## DIMENSIONS

Product size (产品尺寸)

Units (单位): mm(毫米)



Pad size (焊盘尺寸)



(Bottom View)  
仰视图

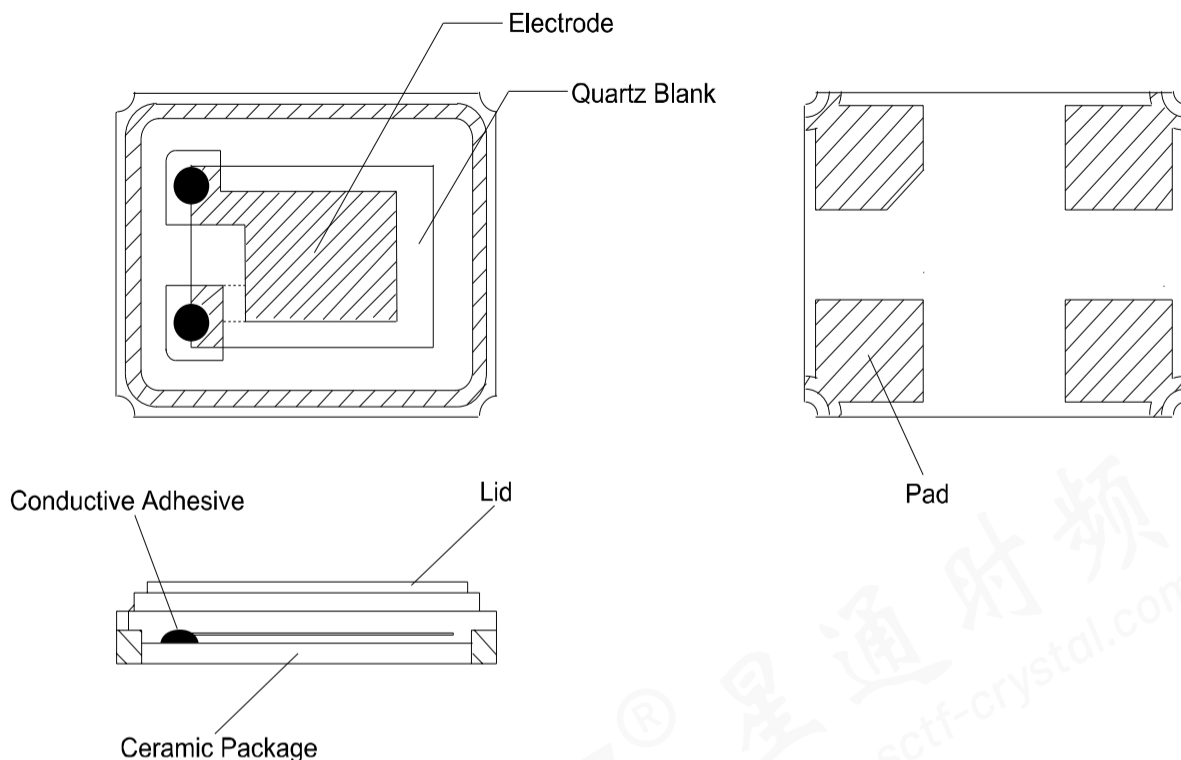
suggested solder pad layout

Note: #2, #4 is connected with a cover  
(Please connect with GND or floating.)

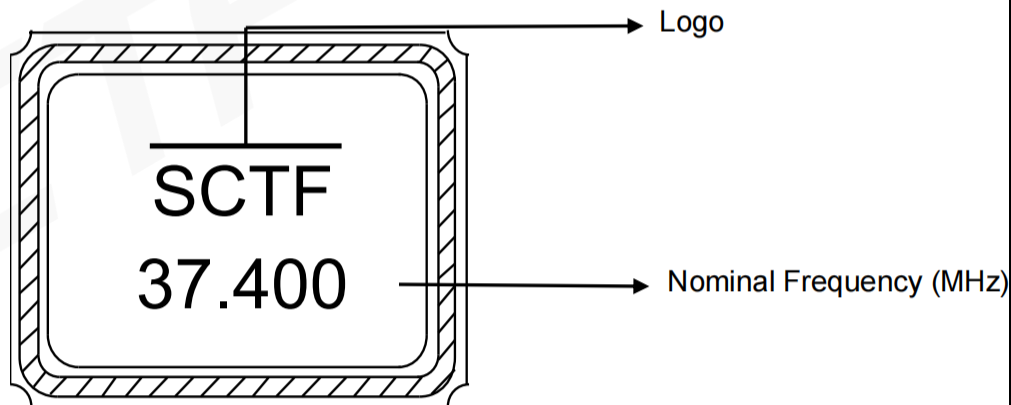
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## ■ PRODUCT STRUCTURE & MARKING

### ◆ Product Structure 产品结构



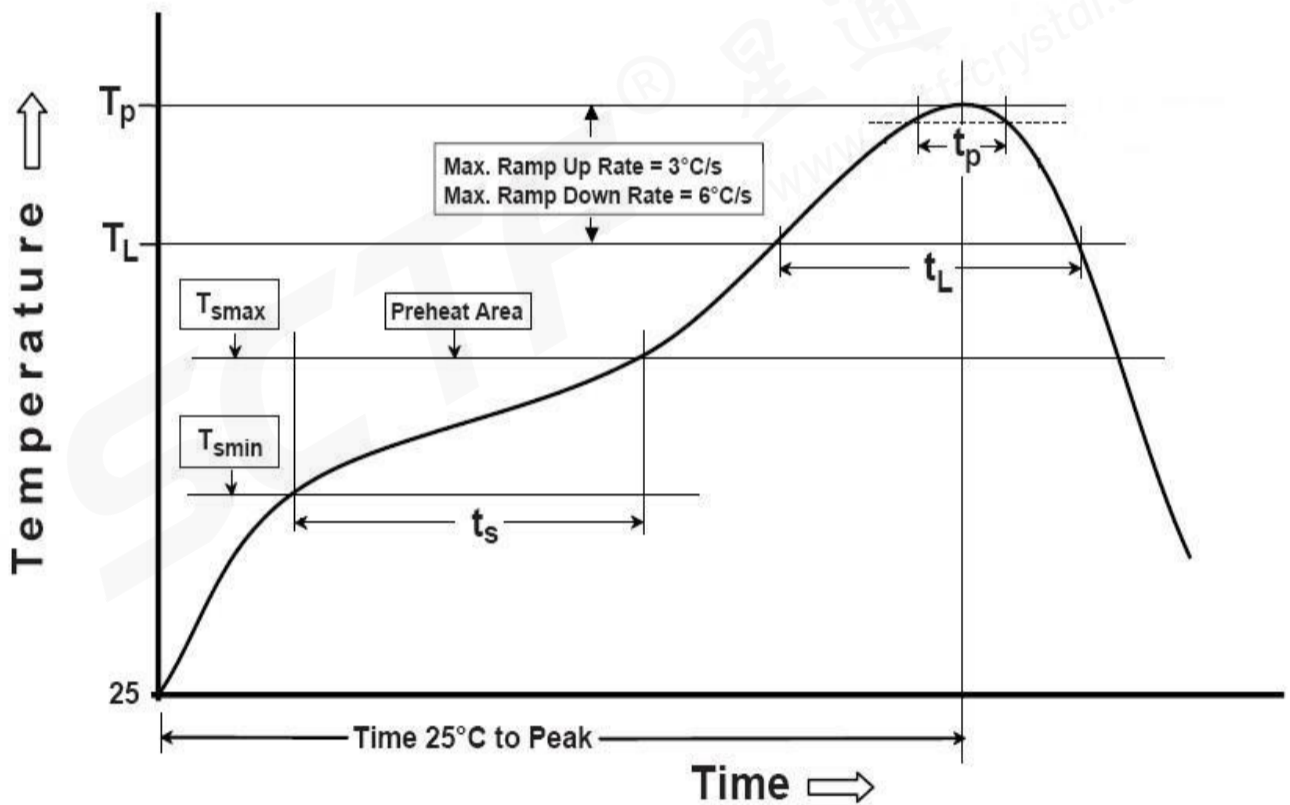
### ◆ Marking 印字



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## REFLOW PROFILES

| 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

| 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.   | $\Delta FL \leq \pm 5 \text{ppm}$<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 rate: $98 \text{m/s}^2$<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.  | $\Delta FL \leq \pm 5 \text{ppm}$<br>$\Delta RR \leq RR(\text{max}) * 10\%$ |
| 3         | 温度变化<br>TEMPERATURE SHOCK | $-40^\circ\text{C} \pm 2^\circ\text{C}$ (30min) $\leftrightarrow$ $85^\circ\text{C} \pm 2^\circ\text{C}$ (30min); 循环10次<br>$-40^\circ\text{C} \pm 2^\circ\text{C}$ (30min) $\leftrightarrow$ $85^\circ\text{C} \pm 2^\circ\text{C}$ (30min); For 10 cycles  | $\Delta FL \leq \pm 5 \text{ppm}$<br>$\Delta RR \leq RR(\text{max}) * 10\%$ |
| 4         | 湿热<br>HUMIDITY            | 温度: $40^\circ\text{C} \pm 2^\circ\text{C}$ ; 湿度 90-95%; 时间: 96小时<br>Temp: $40^\circ\text{C} \pm 2^\circ\text{C}$ ; Humidity: 90-95%; Times: 96h   | $\Delta FL \leq \pm 5 \text{ppm}$<br>$\Delta RR \leq RR(\text{max}) * 10\%$ |
| 5         | 低温<br>COLD RESISTANCE     | 温度: $-40^\circ\text{C} \pm 2^\circ\text{C}$ ; 时间: 96小时<br>Temp: $-40^\circ\text{C} \pm 2^\circ\text{C}$ ; Times: 96h  | $\Delta FL \leq \pm 5 \text{ppm}$<br>$\Delta RR \leq RR(\text{max}) * 10\%$ |
| 6         | 高温1<br>HEAT RESISTANCE 1  | 温度: $100^\circ\text{C} \pm 2^\circ\text{C}$ ; 时间: 96小时<br>Temp: $100^\circ\text{C} \pm 2^\circ\text{C}$ ; Times: 96h  | $\Delta FL \leq \pm 5 \text{ppm}$<br>$\Delta RR \leq RR(\text{max}) * 10\%$ |
| 7         | 高温2<br>HEAT RESISTANCE 2  | 温度: $155^\circ\text{C} \pm 2^\circ\text{C}$ ; 时间: 2小时<br>Temp: $155^\circ\text{C} \pm 2^\circ\text{C}$ ; Times: 2h  | $\Delta FL \leq \pm 5 \text{ppm}$<br>$\Delta RR \leq RR(\text{max}) * 10\%$ |
| 8         | 高温3<br>HEAT RESISTANCE 3  | 温度: $85^\circ\text{C} \pm 2^\circ\text{C}$ ; 电压: 3.3V/5.0V; 时间: 96小时<br>Temp: $85^\circ\text{C} \pm 2^\circ\text{C}$ ; Voltage: 3.3V/5.0V; Times: 96h   | $\Delta FL \leq \pm 5 \text{ppm}$<br>$\Delta RR \leq RR(\text{max}) * 10\%$ |
| 9         | 回流焊<br>REFLOW             | $150^\circ\text{C} \pm 5^\circ\text{C}$ 保持 120s 后升到 $270^\circ\text{C} \pm 5^\circ\text{C}$ 保持 10s, 升温 and 保温时间小于 200s, 常温放置 1~2h 后测定<br>Keep $150^\circ\text{C} \pm 5^\circ\text{C}$ 120s and then rose to $270^\circ\text{C} \pm 5^\circ\text{C}$ for 10s, warming and holding time is less than the 200s, placed at room temperature 1 ~ 2h after test | $\Delta FL \leq \pm 5 \text{ppm}$<br>$\Delta RR \leq RR(\text{max}) * 10\%$ |
| 10        | 盐雾<br>SALT SPRAY          | 盐雾浓度: 5%; 温度: $35^\circ\text{C}$ ; 时间: 24小时<br>Salt density: 5%; Temp: $35^\circ\text{C}$ ; Times: 24h  | 目测无明显腐蚀现象<br>Visual no significant corrosion.                               |
| 11        | 老化<br>AGING               | 温度: $85^\circ\text{C}$ ; 时间: 30天<br>Temp: $85^\circ\text{C}$ ; Times: 30days  | $\Delta FL \leq \pm 5 \text{ppm}$<br>$\Delta RR \leq RR(\text{max}) * 10\%$ |
| 12        | 气密性<br>LEAKAGE            | 氦气 (0.6~0.65MPa): 10分钟<br>He (0.6~0.65MPa): 10min   | $\leq 3 * 10^{-9} \text{Pa} \cdot \text{m}^3/\text{s}$                      |
| 13        | 焊接<br>SOLDER              | 温度: $235^\circ\text{C} \pm 5^\circ\text{C}$<br>Temp: $235^\circ\text{C} \pm 5^\circ\text{C}$  | 浸锡率大于 90%<br>Soldering tin rate greater than 90%                            |

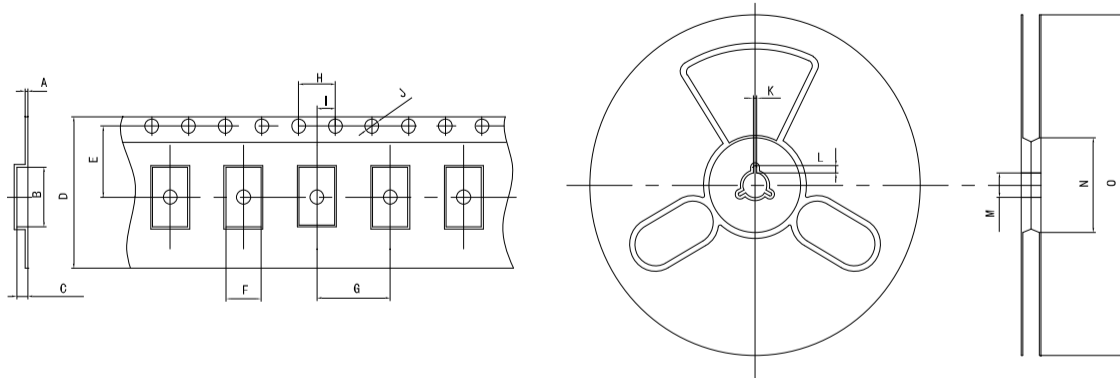
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# PACKAGE

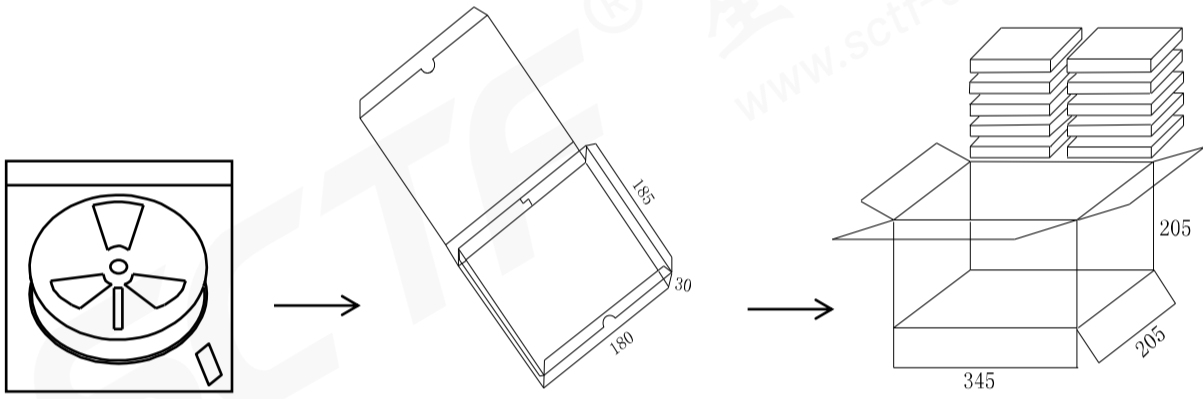
## ◆ Taping Specifications 编带规格

UNIT (单位): mm(毫米)



| TEYE        | A    | B    | C    | D    | E    | F    | G    | H    | I    | J    | K    | L    | M     | N     | O      |
|-------------|------|------|------|------|------|------|------|------|------|------|------|------|-------|-------|--------|
| 1.6×1.2 SMD | 0.25 | 1.85 | 0.45 | 8.00 | 3.50 | 1.45 | 4.00 | 4.00 | 2.00 | 1.55 | 2.00 | 4.00 | 13.00 | 60.00 | 180.00 |

## ◆ Packaging specifications 包装规格



自封袋 (Bag)  
3000只 = 1 轮  
3000pcs = 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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