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| 编号 | SCTF2021T016 |
| 日期 | 2021-9-30 |
| 版本 | B01 |

承认书

SPECIFICATION FOR APPROVAL

| | |
|-----------------------|------------------------|
| 客户名称 Customer Name: | 0 |
| 供应商物料名称 Part Name: | 石英晶体谐振器 |
| 产品描述 Description: | SMD5032 24.000MHz/20PF |
| 供应商物料料号 Part NO.: | SX5B24.000F2020F30 |
| 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 |
| 陈雪清 | 李良 | 胡华才 |

RoHS Compliant

| Revision Record | | | | |
|------------------------|--------------------|--|-------------------|----------------|
| Rev. | Revise page 修订页 | Revise contents 修订内容 | Rev. Date 修订日期 | Reviser 修订人 |
| A02 | N/A | Initial released. | 2013-1-1 | Martin.Hu |
| A03 | N/A | The version is upgraded and the content remains unchanged. | 2018-2-25 | Martin.Hu |
| B01 | Page2 | The version is upgraded and add revision record page. | 2021-2-24 | Martin.Hu |
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■ QUARTZ CRYSTAL UNIT SPECIFICATION

1. Crystal Unit Spec:

| N0. | Item | Symb. | Electrical Spec. | Notes |
|-----|-------------------------------------|--|--------------------------|---|
| 1 | Nominal Frequency 标称频率 | f | 24.000000 MHz | |
| 2 | Oscillation Mode 振荡模式 | | AT Fundamental | |
| 3 | Holder Type 封装 | | SMD5032 | |
| 4 | Frequency Tolerance 常温频差 | $\Delta f/f$ | $\pm 20\text{PPM}$ | at 25°C $\pm 2^\circ\text{C}$ |
| 5 | Drive Level 激励功率 | DL | 10 μW Typical | See the 2.1 |
| 6 | Load Capacitance 负载电容 | CL | 20PF | See the 2.2 |
| 7 | Effective Resistance 谐振电阻 | RR | 30 Ω max. | See the 2.3 |
| 8 | Shunt Capacitance 静电容 | C0 | 5 pF max. | |
| 9 | Drive Level Dependency 激励功率依赖性 | DLD2 | 10 Ω max. | Sweep from 100nW to 100uW in 20 steps. |
| 10 | Temperature Drift 温度频差 | f_tem | $\pm 30\text{PPM}$ | Over Operating Temp. Range (Reference 25°C) |
| 11 | Spurious response 寄生响应 | SPDB | -3dB max. | Start -1000ppm stop 5000ppm 30 steps power applied: 10dBm |
| 12 | Operating Temperature Range 工作温度 | T_use | -40~85°C | |
| 13 | Storage Temperature Range 存储温度 | T_sta | -55~125°C | |
| 14 | Insulation Resistance 绝缘阻抗 | IR | 500 M Ω | at DC 100V |
| 15 | Aging 年老化率 | f_age | ± 3 ppm | 1st Year |
| 16 | Measurement Condition 测量条件 | Measured by S&A250B or equivalen, TA=25°C $\pm 2^\circ\text{C}$, RH=40%~70% | | |

2. Circuit Coditions Spec:

2.1 Drive Level (DL) 300 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) : 20PF

(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) $\geq 150\Omega$

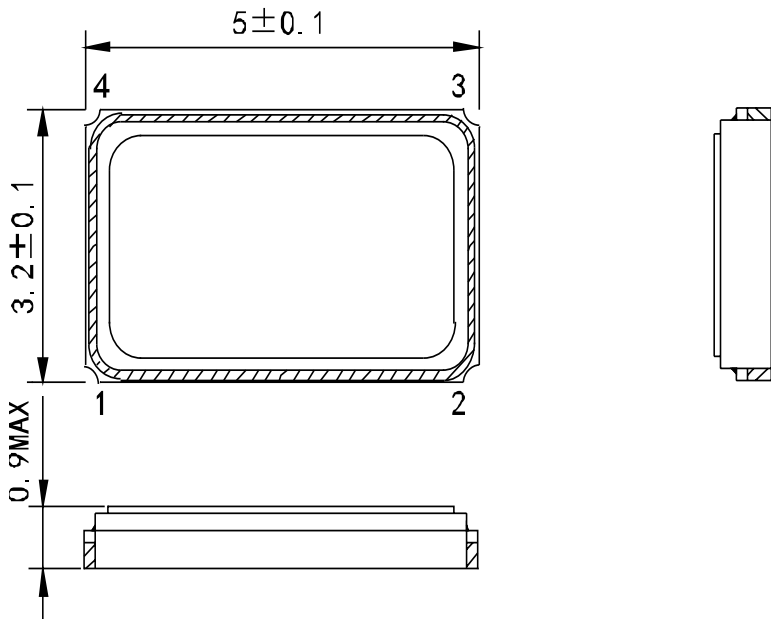
(If -R more than ESR spec of 5 times will be better. If Negative Resistance is too low, that may cause crystal resonator stop oscillation or not easy to oscillate)

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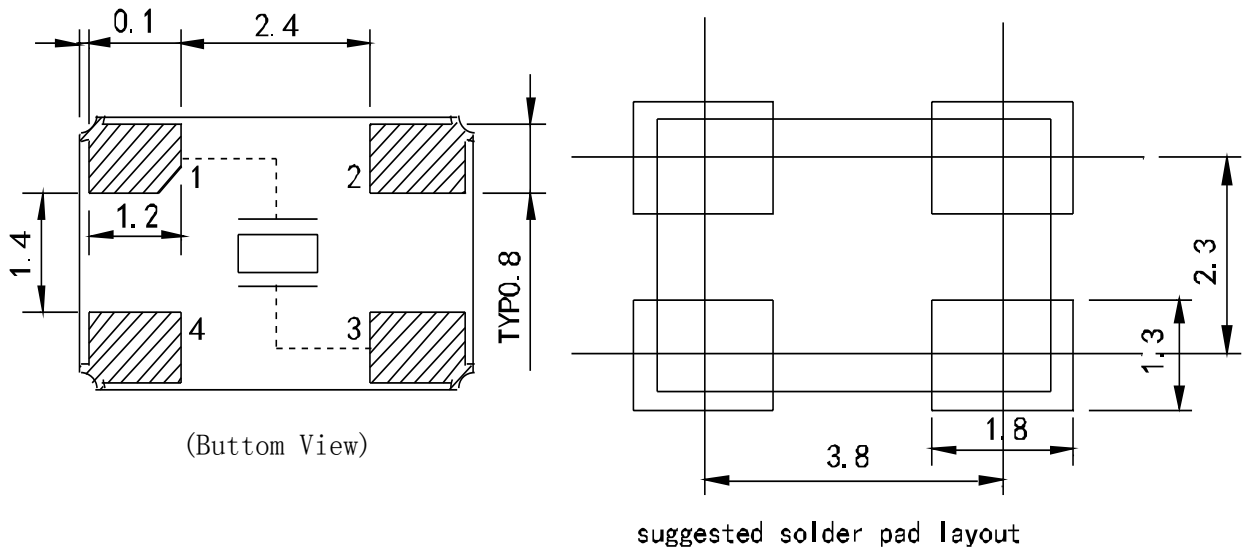
■ DIMENSIONS

产品尺寸 (Product size)

Units (单位): mm(毫米)



焊盘尺寸 (Pad size)

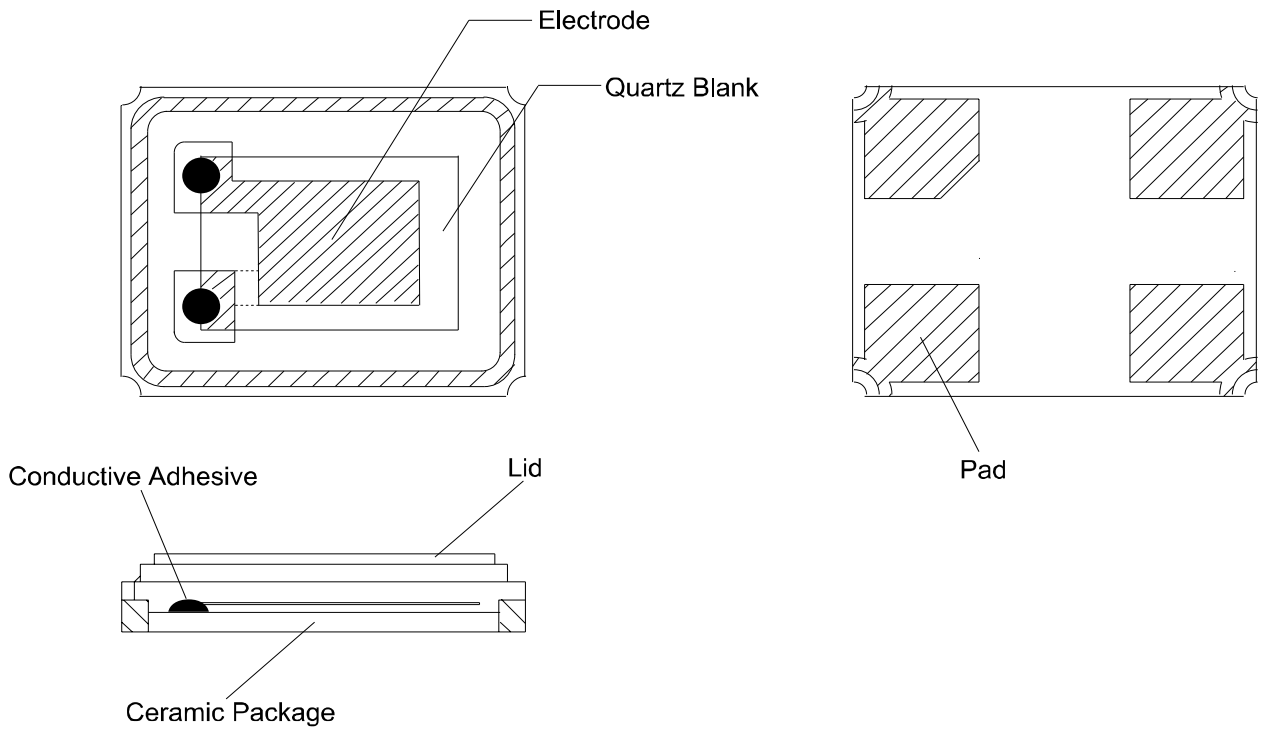


- Note: (1) The missing pad is also correct on the 4th pin, this pin is not used as a starting position.
 (2) Product pin 2 and pin 4 are connected with a cover, please connect with GND or floating.

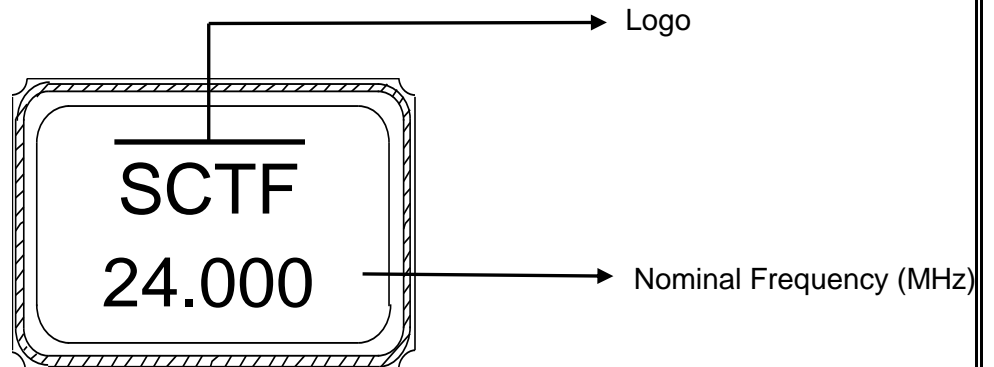
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■ PRODUCT STRUCTURE & MARKING

◆ Product Structure 产品规格



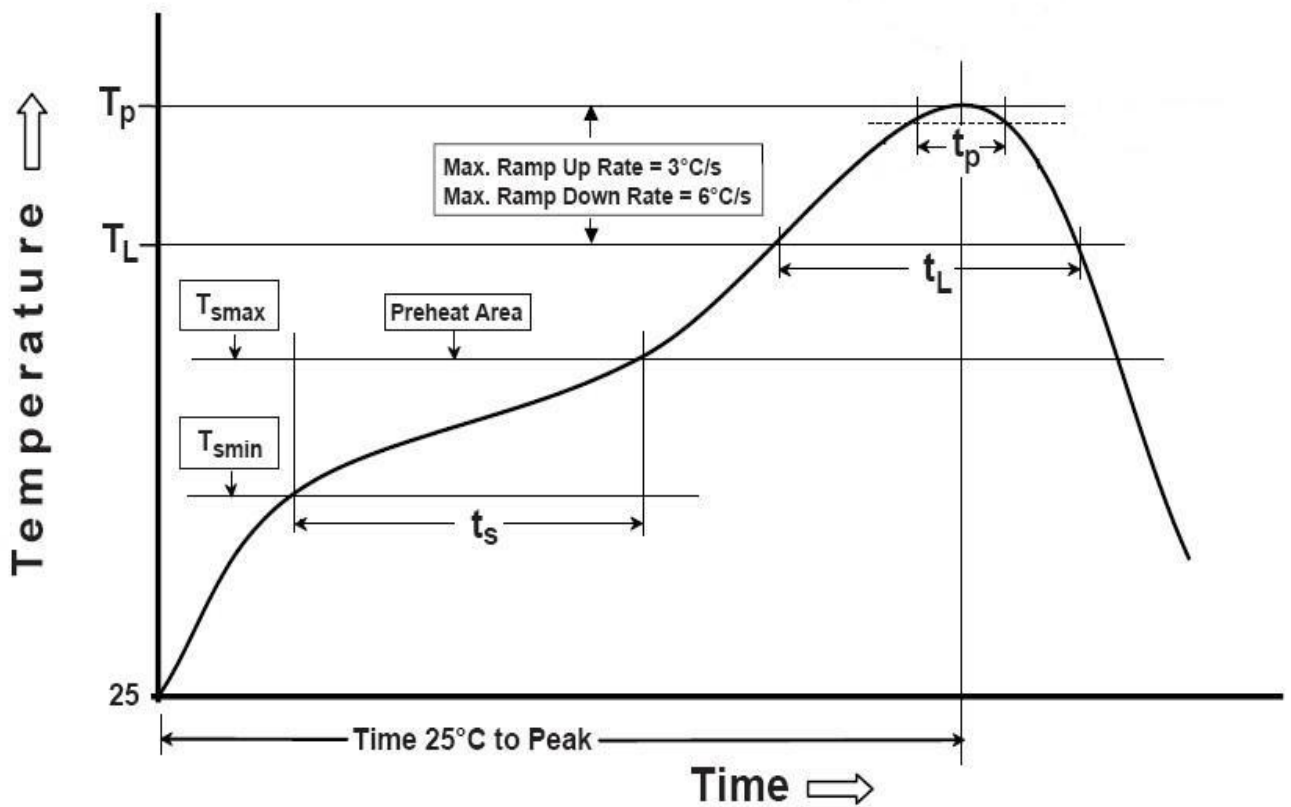
◆ Marking 印字



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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. |
| Suggest reflow times | 3 Times max. | |



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■ RELIABILITY SPECIFICATION

| 序号 NO. | 项目 ITEM | 条件 CONDITIONS | 合格标准 BASIS OF VERDICT |
|-----------|---------------------------|---|--|
| 1 | 跌落 DROP | 100cm高处自由跌落到3cm厚木板上,3次 High:100cm;Thickness:3cm;3 times. | $\Delta FL \leq \pm 5\text{ppm}$ $\Delta RR \leq RR(\text{max}) * 10\%$ |
| 2 | 振动 VIBRATION | 频率 Frequency:10~57.7Hz;幅度 Amplitude: $\pm 0.75\text{mm}$ 频率Frequency:57.7Hz~500Hz;加速度幅度acceleration rate:98m/s ² 周期 Cycle time:10-500-10Hz: 15min 振动方向 Direction:X,Y, Z 振动时间 Duration: 每个方向2小时 2 h/direction. | $\Delta FL \leq \pm 5\text{ppm}$ $\Delta RR \leq RR(\text{max}) * 10\%$ |
| 3 | 温度变化 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 $-40^{\circ}\text{C} \pm 2^{\circ}\text{C}$ (30min) \leftrightarrow $85^{\circ}\text{C} \pm 2^{\circ}\text{C}$ (30min);For 10 cycles | $\Delta FL \leq \pm 5\text{ppm}$ $\Delta RR \leq RR(\text{max}) * 10\%$ |
| 4 | 湿热 HUMIDITY | 温度: $40^{\circ}\text{C} \pm 2^{\circ}\text{C}$;湿度90-95%;时间:96小时 Temp: $40^{\circ}\text{C} \pm 2^{\circ}\text{C}$;Humidity:90-95%;Times:96h | $\Delta FL \leq \pm 5\text{ppm}$ $\Delta RR \leq RR(\text{max}) * 10\%$ |
| 5 | 低温 COLD RESISTANCE | 温度: $-40^{\circ}\text{C} \pm 2^{\circ}\text{C}$;时间:96小时 Temp: $-40^{\circ}\text{C} \pm 2^{\circ}\text{C}$;Times:96h | $\Delta FL \leq \pm 5\text{ppm}$ $\Delta RR \leq RR(\text{max}) * 10\%$ |
| 6 | 高温1 HEAT RESISTANCE 1 | 温度: $100^{\circ}\text{C} \pm 2^{\circ}\text{C}$;时间:96小时 Temp: $100^{\circ}\text{C} \pm 2^{\circ}\text{C}$;Times:96h | $\Delta FL \leq \pm 5\text{ppm}$ $\Delta RR \leq RR(\text{max}) * 10\%$ |
| 7 | 高温2 HEAT RESISTANCE 2 | 温度: $155^{\circ}\text{C} \pm 2^{\circ}\text{C}$;时间:2小时 Temp: $155^{\circ}\text{C} \pm 2^{\circ}\text{C}$;Times:2h | $\Delta FL \leq \pm 5\text{ppm}$ $\Delta RR \leq RR(\text{max}) * 10\%$ |
| 8 | 高温3 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 Temp: $85^{\circ}\text{C} \pm 2^{\circ}\text{C}$;Voltage:3.3V/5.0V;Times:96h | $\Delta FL \leq \pm 5\text{ppm}$ $\Delta RR \leq RR(\text{max}) * 10\%$ |
| 9 | 回流焊 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 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 | $\Delta FL \leq \pm 5\text{ppm}$ $\Delta RR \leq RR(\text{max}) * 10\%$ |
| 10 | 盐雾 SALT SPRAY | 盐雾浓度:5%;温度: 35°C ;时间:24小时 Salt density:5%;Temp: 35°C ;Times:24h | 目测无明显腐蚀现象 Visual no significant corrosion. |
| 11 | 老化 AGING | 温度: 85°C ;时间:30天 Temp: 85°C ;Times:30days | $\Delta FL \leq \pm 5\text{ppm}$ $\Delta RR \leq RR(\text{max}) * 10\%$ |
| 12 | 气密性 LEAKAGE | 氦气(0.6~0.65MPa):10分钟 He(0.6~0.65MPa):10min | $\leq 3 * 10^{-9} \text{Pa} \cdot \text{m}^3/\text{s}$ |
| 13 | 焊接 SOLDER | 温度: $260^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Temp: $260^{\circ}\text{C} \pm 5^{\circ}\text{C}$ | 浸锡率大于90% Soldering tin rate greater than 90% |

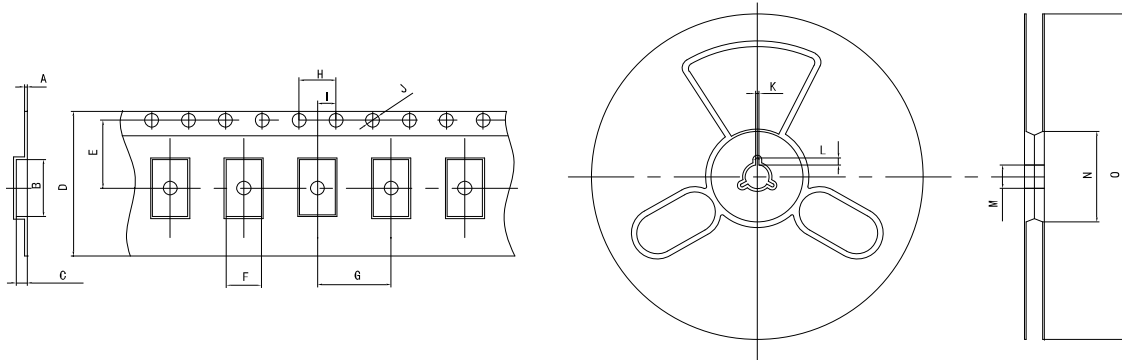
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PACKAGE

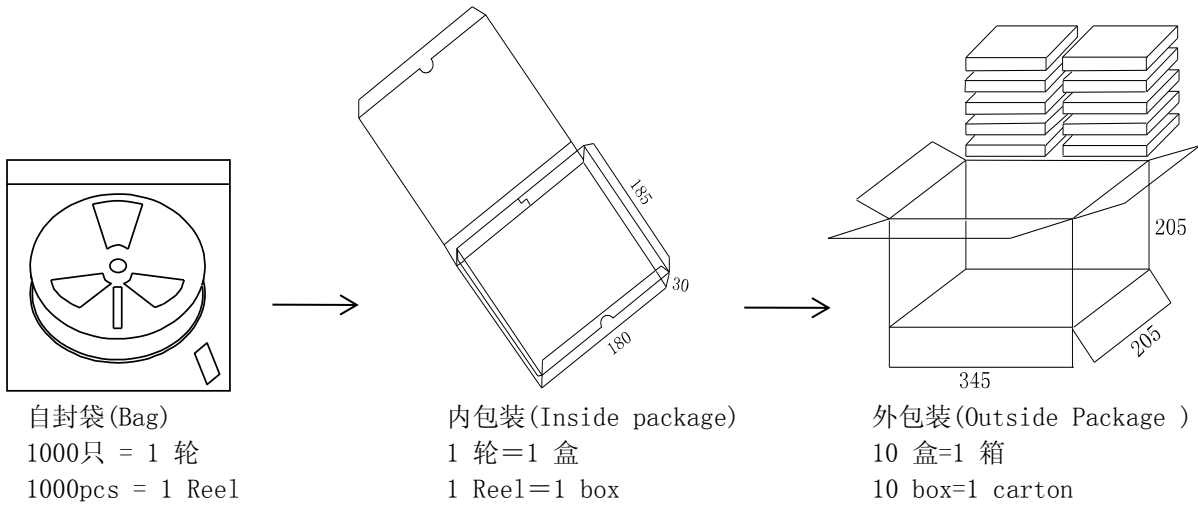
◆ Taping Specifications 编带规格

UNIT(单位):mm(毫米)



| TEYE | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O |
|-----------|-----|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|------|------|-------|
| 5×3.2 SMD | 0.3 | 5.5 | 1.2 | 12.0 | 5.5 | 3.7 | 8.0 | 4.0 | 2.0 | 1.5 | 2.0 | 4.0 | 13.0 | 60.0 | 180.0 |

◆ Packaging specifications 包装规格



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