

## 外形尺寸 Shape and Dimensions

- 尺寸：见图 1 和表 1
- PCB 焊盘：见图 2 和表 1
- Dimensions: See Fig.1 and Table 1.
- Recommended PCB pattern for reflow soldering: See Fig.2 and Table 1

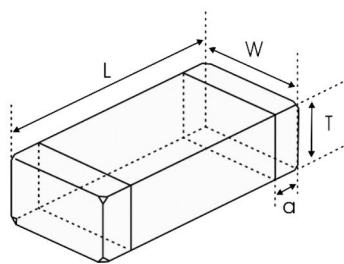


图 1 Fig.1

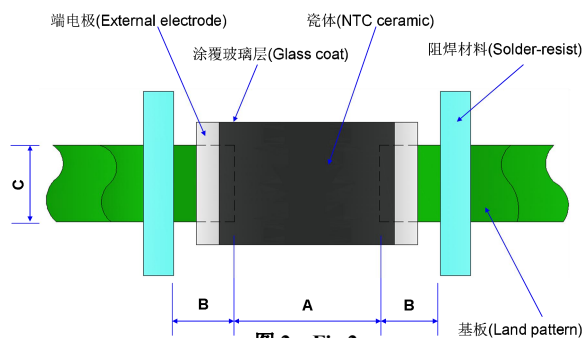


图 2 Fig.2

表 1 (Table 1)

单位 unit: inch[mm]

| 类别 Type        | L                         | W                         | T                         | a                        | A         | B         | C         |
|----------------|---------------------------|---------------------------|---------------------------|--------------------------|-----------|-----------|-----------|
| 0603<br>[1608] | 0.063±0.006<br>[1.6±0.15] | 0.031±0.006<br>[0.8±0.15] | 0.031±0.006<br>[0.8±0.15] | 0.012±0.008<br>[0.3±0.2] | [0.6-0.8] | [0.6-0.7] | [0.6-0.8] |

## 电气特性 Electrical Characteristics

| 型号<br>Part No     | 电阻值<br>Resistance<br>(25°C)<br>(kΩ) | B 常数<br>B Constant<br>(25/50°C)<br>(K) | B 常数<br>B Constant<br>(25/85°C)<br>(K) | 允许工作电流<br>Permissible<br>Operating Current<br>(25°C)<br>(mA) | 耗散系数<br>Dissipation<br>Factor<br>(mW/°C) | 热时间常数<br>Thermal<br>Time<br>Constant<br>(s) | 额定功率<br>Rated Electric<br>Power(25°C)<br>(mW) | 工作温度<br>Operating<br>ambient<br>temperature<br>(°C) |
|-------------------|-------------------------------------|--|--|--|--|---|---|---|
| KNTC0603/30KJ3950 | 30±5%                               | 3950±1%                                | 3987                                   | 0.18   | 1.0                                      | <5  | 100   | -40~+125  |

## 检验和测试程序

### 测试条件

如无特别规定，检验和测试的标准大气环境条件如下：

- 环境温度：20±15℃；
- 相对湿度：65±20%；
- 气压：86 kPa~106 kPa

如果对测试结果有异议，则在下述条件下测试：

- 环境温度：25±2℃；
- 相对湿度：65±5%
- 气压：86kPa ~ 106kPa

### 检查设备

外观检查：20 倍放大镜；

阻值检查：热敏电阻测试仪

## Test and Measurement Procedures

### Test Conditions

Unless otherwise specified, the standard atmospheric conditions for measurement/test as:

- Ambient Temperature: 20±15℃
- Relative Humidity: 65±20%
- Air Pressure: 86kPa to 106kPa

If any doubt on the results, measurements/tests should be made within the following limits:

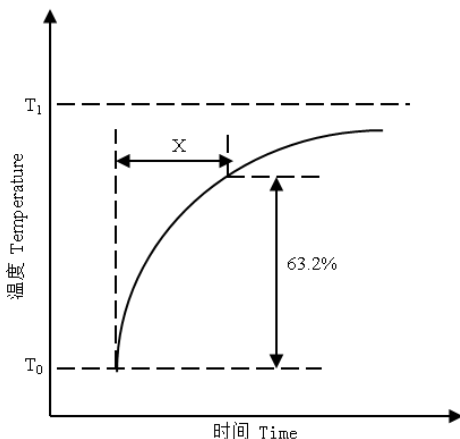
- Ambient Temperature: 25±2℃
- Relative Humidity: 65±5%
- Air Pressure: 86kPa to 106kPa

### Inspection Equipment

Visual Examination: 20× magnifier

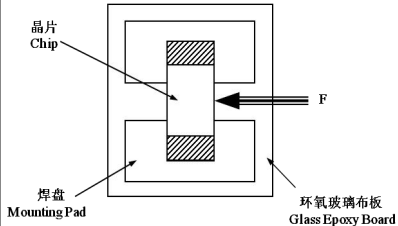
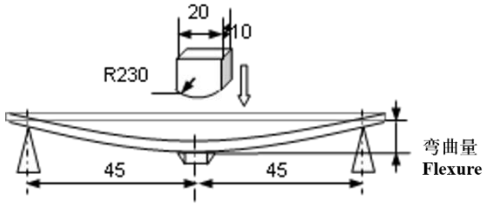
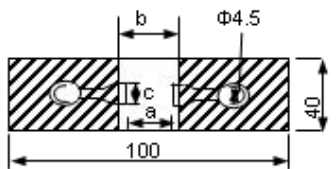
Resistance value test: Thermistor resistance tester

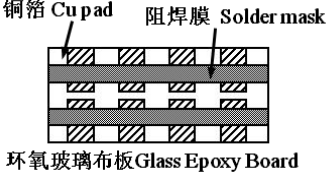
## 电性测试 Electrical Test

| 序号 No. | 项目 Items  | 测试方法及备注 Test Methods and Remarks   |
|--------|---|--|
| 1      | 25℃零功率电阻值<br>Nominal Zero-Power Resistance at<br>25℃(R25) | 环境温度 Ambient temperature: 25±0.05℃<br>测试功率 Measuring electric power: ≤0.1mW  |
| 2      | B 值常数<br>Nominal B Constant                               | 分别在环境温度 25±0.05℃, 50±0.05℃或 85±0.05℃下测量电阻值。<br>Measure the resistance at the ambient temperature of 25±0.05℃, 50±0.05℃ or 85±0.05℃.<br>$B(25-50^{\circ}\text{C}) = \frac{\ln R_{25} - \ln R_{50}}{1/T_{25} - 1/T_{50}} \quad B(25-85^{\circ}\text{C}) = \frac{\ln R_{25} - \ln R_{85}}{1/T_{25} - 1/T_{85}}$<br>T: 绝对温度 (K) Absolute temperature (K)   |
| 3      | 热时间常数<br>Thermal Time Constant                            | 在零功率条件下，当热敏电阻的环境温度发生急剧变化时，热敏电阻元件产生最初温度 T <sub>0</sub> 与最终温度 T <sub>1</sub> 两者温度差的 63.2% 的温度变化所需要的时间，通常以秒(S)表示。<br>The total time for the temperature of the thermistor to change by 63.2% of the difference from ambient temperature T <sub>0</sub> (°C) to T <sub>1</sub> (°C) by the drastic change of the power applied to thermistor from Non-zero Power to Zero-Power state, normally expressed in second(S).<br> |

|   |   |   |
|---|---|---|
| 4 | 耗散系数<br>Dissipation Factor              | 在一定环境温度下，NTC 热敏电阻通过自身发热使其温度升高 1℃ 时所需要的功率，通常以 mW/℃ 表示。可由下面公式计算：<br>The required power which makes the NTC thermistor body temperature raise 1℃ through self-heated, normally expressed in milliwatts per degree Celsius (mW/℃). It can be calculated by the following formula:<br>$\delta = \frac{W}{T-T_0}$ |
| 5 | 额定功率<br>Rated Power                     | 在环境温度 25℃ 下因自身发热使表面温度升高 100℃ 所需要的功率。<br>The necessary electric power makes thermistor's temperature rise 100℃ by self-heating at ambient temperature 25℃.   |
| 6 | 允许工作电流<br>Permissible operating current | 在静止空气中通过自身发热使其升温为 1℃ 的电流。<br>The current that keep body temperature of chip NTC on the PC board in still air rising 1℃ by self-heating.   |

### 信赖性试验 Reliability Test

| 项目<br>Items                   | 测试标准<br>Standard | 测试方法及备注<br>Test Methods and Remarks   | 要求<br>Requirements |               |                         |                  |       |       |          |       |   |     |   |         |   |   |   |      |      |     |     |      |     |     |     |      |     |     |     |      |     |     |      |
|-------------------------------|------------------|---|--------------------|---------------|-------------------------|------------------|-------|-------|----------|-------|---|-----|---|---------|---|---|---|------|------|-----|-----|------|-----|-----|-----|------|-----|-----|-----|------|-----|-----|------|
| 端头附着力<br>Terminal Strength    | IEC 60068-2-21   | <p>将晶片焊接在测试基板上（如右图所示的环氧玻璃布板），按箭头所示方向施加作用力；<br/>Solder the chip to the testing jig (glass epoxy board shown in the right) using eutectic solder. Then apply a force in the direction of the arrow.</p> <table border="1"> <thead> <tr> <th>尺寸 Size</th> <th>F</th> <th>保持时间 Duration</th> </tr> </thead> <tbody> <tr> <td>0201, 0402, 0603</td> <td>5N</td> <td rowspan="2">10±1s</td> </tr> <tr> <td>0805</td> <td>10N</td> </tr> </tbody> </table>   | 尺寸 Size            | F             | 保持时间 Duration           | 0201, 0402, 0603 | 5N    | 10±1s | 0805     | 10N   | <p>端电极无脱落且瓷体无损伤。<br/>No removal or split of the termination or other defects shall occur.</p>  |     |   |         |   |   |   |      |      |     |     |      |     |     |     |      |     |     |     |      |     |     |      |
| 尺寸 Size                       | F                | 保持时间 Duration   |                    |               |                         |                  |       |       |          |       |   |     |   |         |   |   |   |      |      |     |     |      |     |     |     |      |     |     |     |      |     |     |      |
| 0201, 0402, 0603              | 5N               | 10±1s   |                    |               |                         |                  |       |       |          |       |   |     |   |         |   |   |   |      |      |     |     |      |     |     |     |      |     |     |     |      |     |     |      |
| 0805                          | 10N              |   |                    |               |                         |                  |       |       |          |       |   |     |   |         |   |   |   |      |      |     |     |      |     |     |     |      |     |     |     |      |     |     |      |
| 抗弯强度<br>Resistance to Flexure | IEC 60068-2-21   | <p>将晶片焊接在测试基板上（如右图所示的环氧玻璃布板），按下图箭头所示方向施加作用力；<br/>Solder the chip to the test jig (glass epoxy board shown in the right) using a eutectic solder. Then apply a force in the direction shown as follow;</p>  <table border="1"> <thead> <tr> <th>尺寸 Size</th> <th>弯曲变形量 Flexure</th> <th>施压速度 Pressurizing Speed</th> <th>保持时间 Duration</th> </tr> </thead> <tbody> <tr> <td>0201,</td> <td>1mm</td> <td rowspan="2">&lt;0.5mm/s</td> <td rowspan="2">10±1s</td> </tr> <tr> <td>0402, 0603, 0805</td> <td>2mm</td> </tr> </tbody> </table> | 尺寸 Size            | 弯曲变形量 Flexure | 施压速度 Pressurizing Speed | 保持时间 Duration    | 0201, | 1mm   | <0.5mm/s | 10±1s | 0402, 0603, 0805  | 2mm | <p>① 无外观损伤。<br/>No visible damage.<br/>② <math> \Delta R_{25}/R_{25}  \leq 5\%</math></p> <p>单位 unit: mm</p> <table border="1"> <thead> <tr> <th>类型 Type</th> <th>a</th> <th>b</th> <th>c</th> </tr> </thead> <tbody> <tr> <td>0201</td> <td>0.25</td> <td>0.3</td> <td>0.3</td> </tr> <tr> <td>0402</td> <td>0.4</td> <td>1.5</td> <td>0.5</td> </tr> <tr> <td>0603</td> <td>1.0</td> <td>3.0</td> <td>1.2</td> </tr> <tr> <td>0805</td> <td>1.2</td> <td>4.0</td> <td>1.65</td> </tr> </tbody> </table>  | 类型 Type | a | b | c | 0201 | 0.25 | 0.3 | 0.3 | 0402 | 0.4 | 1.5 | 0.5 | 0603 | 1.0 | 3.0 | 1.2 | 0805 | 1.2 | 4.0 | 1.65 |
| 尺寸 Size                       | 弯曲变形量 Flexure    | 施压速度 Pressurizing Speed   | 保持时间 Duration      |               |                         |                  |       |       |          |       |   |     |   |         |   |   |   |      |      |     |     |      |     |     |     |      |     |     |     |      |     |     |      |
| 0201,                         | 1mm              | <0.5mm/s  | 10±1s              |               |                         |                  |       |       |          |       |   |     |   |         |   |   |   |      |      |     |     |      |     |     |     |      |     |     |     |      |     |     |      |
| 0402, 0603, 0805              | 2mm              |   |                    |               |                         |                  |       |       |          |       |   |     |   |         |   |   |   |      |      |     |     |      |     |     |     |      |     |     |     |      |     |     |      |
| 类型 Type                       | a                | b   | c                  |               |                         |                  |       |       |          |       |   |     |   |         |   |   |   |      |      |     |     |      |     |     |     |      |     |     |     |      |     |     |      |
| 0201                          | 0.25             | 0.3   | 0.3                |               |                         |                  |       |       |          |       |   |     |   |         |   |   |   |      |      |     |     |      |     |     |     |      |     |     |     |      |     |     |      |
| 0402                          | 0.4              | 1.5   | 0.5                |               |                         |                  |       |       |          |       |   |     |   |         |   |   |   |      |      |     |     |      |     |     |     |      |     |     |     |      |     |     |      |
| 0603                          | 1.0              | 3.0   | 1.2                |               |                         |                  |       |       |          |       |   |     |   |         |   |   |   |      |      |     |     |      |     |     |     |      |     |     |     |      |     |     |      |
| 0805                          | 1.2              | 4.0   | 1.65               |               |                         |                  |       |       |          |       |   |     |   |         |   |   |   |      |      |     |     |      |     |     |     |      |     |     |     |      |     |     |      |

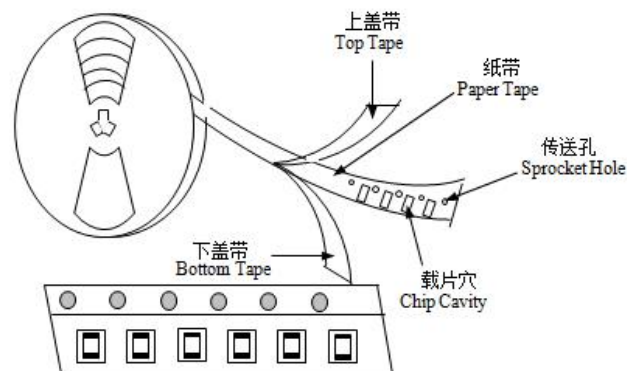
| <p>振动<br/>Vibration</p>                     | <p>IEC 60068-2-80</p> | <p>① 将晶片焊接在测试基板上（如右图所示的环氧玻璃布板）；<br/>Solder the chip to the testing jig (glass epoxy board shown in the left) using eutectic solder.</p> <p>② 晶片以全振幅为 1.5mm 进行振动，频率范围为 10Hz ~55 Hz；<br/>The chip shall be subjected to a simple harmonic motion having total amplitude of 1.5mm, the frequency being varied uniformly between the approximate limits of 10 and 55 Hz.</p> <p>③ 振动频率按 10Hz→55Hz→10Hz 循环，周期为 1 分钟，在空间三个互相垂直的方向上各振动 2 小时（共 6 小时）。<br/>The frequency ranges from 10 to 55 Hz and return to 10 Hz shall be traversed in approximately 1 minute. This motion shall be applied for a period of 2 hours in each 3 mutually perpendicular directions (total of 6 hours).</p> | <p>无外观损伤。<br/>No visible damage.</p>            |                |         |   |        |         |   |       |        |   |        |         |   |       |        |  |
|---|-----------------------|--|--|----------------|---------|---|--------|---------|---|-------|--------|---|--------|---------|---|-------|--------|--|
| <p>坠落<br/>Dropping</p>                      | <p>IEC 60068-2-32</p> | <p>从 1m 的高度让晶片自由坠落至水泥地面 10 次。<br/>Drop a chip 10 times on a concrete floor from a height of 1 meter.</p>   | <p>无外观损伤。<br/>No visible damage.</p>   |                |         |   |        |         |   |       |        |   |        |         |   |       |        |  |
| <p>可焊性<br/>Solderability</p>                | <p>IEC 60068-2-58</p> | <p>① 焊接温度 Solder temperature: 245±5℃.<br/>② 浸渍时间 Duration: 3±0.3s.<br/>③ 焊锡成分 Solder: Sn/3.0Ag/0.5Cu.<br/>④ 助焊剂 Flux: （重量比）25%松香和 75%酒精<br/>25% Resin and 75% ethanol in weight.</p>   | <p>① 无外观损伤；<br/>No visible damage.<br/>② 元件端电极的焊锡覆盖率不小于 95%。<br/>Wetting shall exceed 95% coverage.</p>                            |                |         |   |        |         |   |       |        |   |        |         |   |       |        |  |
| <p>耐焊性<br/>Resistance to Soldering Heat</p> | <p>IEC 60068-2-58</p> | <p>① 焊接温度 Solder temperature: 260±5℃.<br/>② 浸渍时间 Duration: 10±1s.<br/>③ 焊锡成分 Solder: Sn/3.0Ag/0.5Cu.<br/>④ 助焊剂 Flux: （重量比）25%松香和 75%酒精<br/>25% Resin and 75% ethanol in weight.<br/>⑤ 试验后标准条件下放置 1~2 小时后测量。<br/>The chip shall be stabilized at normal condition for 1~2 hours before measuring.</p>   | <p>① 无外观损伤；<br/>No visible damage.<br/>② <math> \Delta R_{25}/R_{25}  \leq 5\%</math><br/>③ <math> \Delta B/B  \leq 2\%</math></p> |                |         |   |        |         |   |       |        |   |        |         |   |       |        |  |
| <p>温度周期<br/>Temperature cycling</p>         | <p>IEC 60068-2-14</p> | <p>① 无负载于下表所示的环境条件下重复 5 次。<br/>5 cycles of following sequence without loading.</p> <table border="1" data-bbox="491 1429 1040 1624"> <thead> <tr> <th>步骤 Step</th> <th>温度 Temperature</th> <th>时间 Time</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-40±5℃</td> <td>30±3min</td> </tr> <tr> <td>2</td> <td>25±2℃</td> <td>5±3min</td> </tr> <tr> <td>3</td> <td>125±2℃</td> <td>30±3min</td> </tr> <tr> <td>4</td> <td>25±2℃</td> <td>5±3min</td> </tr> </tbody> </table> <p>② 试验后标准条件下放置 1~2 小时后测量。<br/>The chip shall be stabilized at normal condition for 1~2 hours before measuring.</p>   | 步骤 Step  | 温度 Temperature | 时间 Time | 1 | -40±5℃ | 30±3min | 2 | 25±2℃ | 5±3min | 3 | 125±2℃ | 30±3min | 4 | 25±2℃ | 5±3min | <p>① 无外观损伤；<br/>No visible damage.<br/>② <math> \Delta R_{25}/R_{25}  \leq 3\%</math><br/>③ <math> \Delta B/B  \leq 2\%</math></p> |
| 步骤 Step                                     | 温度 Temperature        | 时间 Time  |  |                |         |   |        |         |   |       |        |   |        |         |   |       |        |  |
| 1   | -40±5℃                | 30±3min  |  |                |         |   |        |         |   |       |        |   |        |         |   |       |        |  |
| 2   | 25±2℃                 | 5±3min   |  |                |         |   |        |         |   |       |        |   |        |         |   |       |        |  |
| 3   | 125±2℃                | 30±3min  |  |                |         |   |        |         |   |       |        |   |        |         |   |       |        |  |
| 4   | 25±2℃                 | 5±3min   |  |                |         |   |        |         |   |       |        |   |        |         |   |       |        |  |
| <p>高温存放<br/>Resistance to dry heat</p>      | <p>IEC 60068-2-2</p>  | <p>① 在 125±5℃ 空气中，无负载放置 1000±24 小时。<br/>125±5℃ in air, for 1000±24 hours without loading.<br/>② 试验后标准条件下放置 1~2 小时后测量。<br/>The chip shall be stabilized at normal condition for 1~2 hours before measuring.</p>   | <p>① 无外观损伤；<br/>No visible damage.<br/>② <math> \Delta R_{25}/R_{25}  \leq 5\%</math><br/>③ <math> \Delta B/B  \leq 2\%</math></p> |                |         |   |        |         |   |       |        |   |        |         |   |       |        |  |

|   |                       |   |  |
|---|-----------------------|---|--|
| 低温存放<br>Resistance to cold                  | IEC 60068-2-1         | ① 在-40±3℃空气中，无负载放置 1000±24 小时。<br>-40±3℃ in air, for 1000±24 hours without loading.<br>② 试验后标准条件下放置 1~2 小时后测量。<br>The chip shall be stabilized at normal condition for 1~2 hours before measuring.                      | ① 无外观损伤；<br>No visible damage.<br>② $ \Delta R25/R25  \leq 5\%$<br>③ $ \Delta B/B  \leq 2\%$ |
| 湿热存放<br>Resistance to damp heat             | IEC 60068-2-78        | ① 在 40±2℃，相对湿度 90~95%空气中，无负载放置 1000±24 小时。<br>40±2℃, 90~95%RH in air, for 1000±24 hours without loading.<br>② 试验后标准条件下放置 1~2 小时后测量。<br>The chip shall be stabilized at normal condition for 1~2 hours before measuring. | ① 无外观损伤；<br>No visible damage.<br>② $ \Delta R25/R25  \leq 3\%$<br>③ $ \Delta B/B  \leq 2\%$ |
| 高温负荷<br>Resistance to high temperature load | IEC 60539-1<br>5.25.4 | ① 在 85±2℃空气中，施加允许工作电流 1000±48 小时。<br>85±2℃ in air with permissive operating current for 1000±48 hours<br>② 试验后标准条件下放置 1~2 小时后测量。<br>The chip shall be stabilized at normal condition for 1~2 hours before measuring.    | ① 无外观损伤；<br>No visible damage.<br>② $ \Delta R25/R25  \leq 5\%$<br>③ $ \Delta B/B  \leq 2\%$ |

## 编带 Taping

|                            |               |          |          |          |
|----------------------------|---------------|----------|----------|----------|
| 类型 Type                    | 0201          | 0402     | 0603     | 0805     |
| 编带厚度<br>Tape thickness(mm) | 0.5±0.15      | 0.5±0.15 | 0.8±0.15 | 0.85±0.2 |
| 编带材质<br>Tape material      | 纸带 Paper Tape |          |          |          |
| 每盘数量<br>Quantity per Reel  | 15K           | 10K      | 4K       | 4K       |

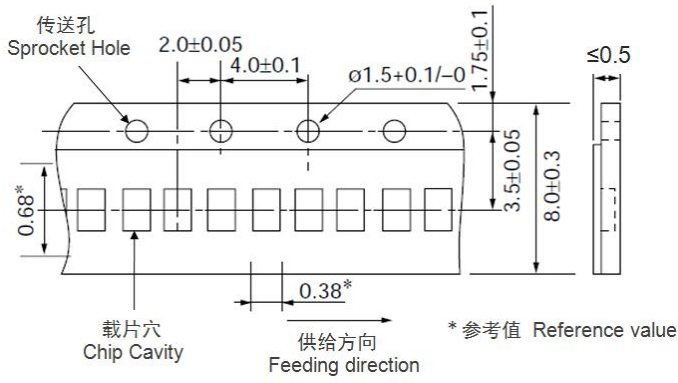
### (1) 编带图 Taping Drawings



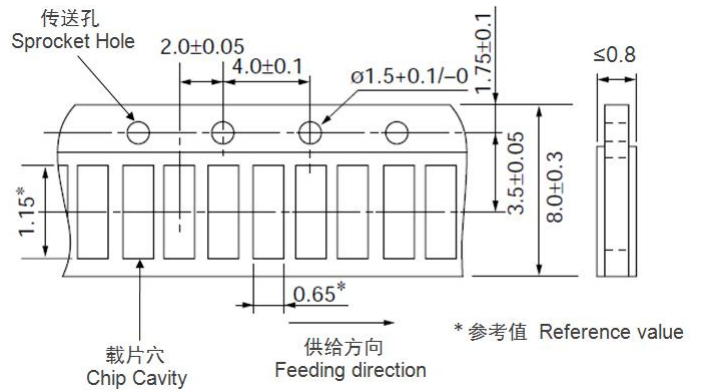
(2) 纸带尺寸 Paper Tape Dimensions

(单位 Unit: mm)

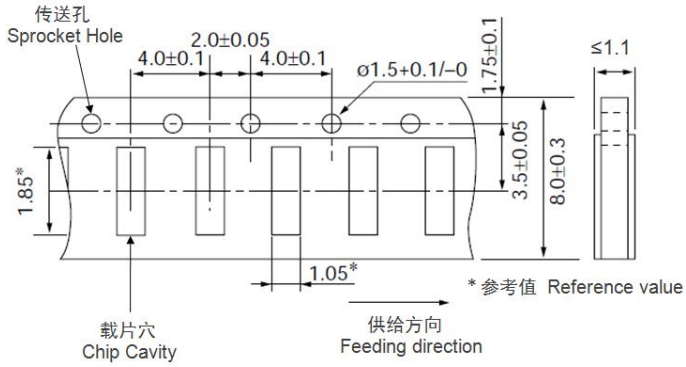
0201 系列



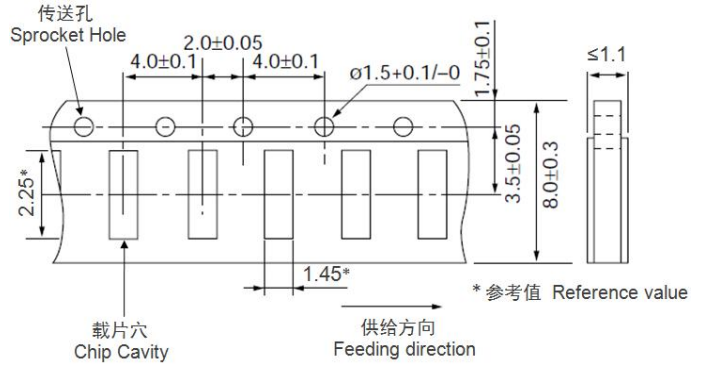
0402 系列



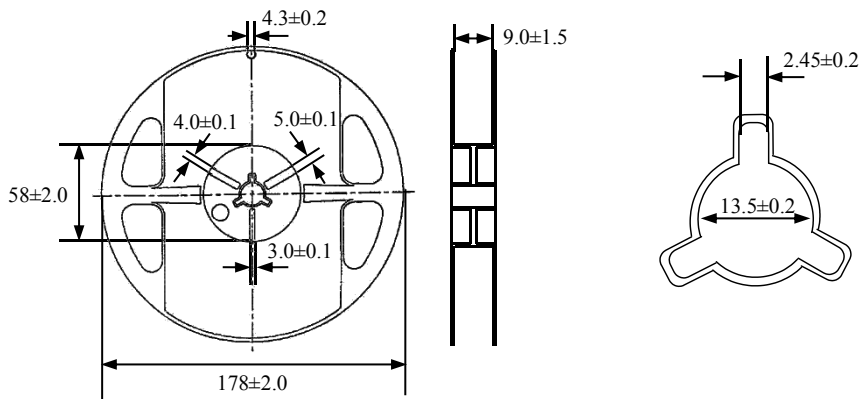
0603 系列



0805 系列



(3) 卷盘尺寸 Reel Dimensions (单位 Unit: mm)



## 储存

- **储存条件**
  - a. 储存温度:  $-10^{\circ}\text{C} \sim 40^{\circ}\text{C}$
  - b. 相对湿度:  $\leq 75\%RH$
  - c. 避免接触粉尘、腐蚀性气氛和阳光
- **储存期限: 产品交付后 6 个月**

## 注意事项

- 热敏电阻不可在以下条件下工作或储存:
  - (1) 腐蚀性气体或还原性气体  
(氯气、硫化氢气体、氨气、硫酸气体、一氧化氮等)。
  - (2) 挥发性或易燃性气体
  - (3) 多尘条件
  - (4) 高压或低压条件
  - (5) 潮湿场所
  - (6) 存在盐水、油、化学液体或有机溶剂的场所
  - (7) 强烈振动
  - (8) 存在类似有害条件的其他场所
- 热敏电阻的陶瓷属于易碎材料，使用时不可施加过大压力或冲击。
- 热敏电阻不可在超过目录规定的温度范围情况下工作。

## Storage

- **Storage Conditions**
  - a. Storage Temperature:  $-10^{\circ}\text{C} \sim 40^{\circ}\text{C}$
  - b. Relative Humidity:  $\cong 75\%RH$
  - c. Keep away from corrosive atmosphere and sunlight.
- **Period of Storage: 6 Months after delivery**

## Notes & Warnings

- The thermistors shall not be operated and stored under the following environmental condition:
  - (1) Corrosive or deoxidized atmospheres  
(such as chlorine, sulfurated hydrogen, ammonia, sulfuric acid, nitric oxide and so on)
  - (2) Volatile or inflammable atmospheres
  - (3) Dusty condition
  - (4) Excessively high or low pressure condition
  - (5) Humid site
  - (6) Places with brine, oil, chemical liquid or organic solvent
  - (7) Intense vibration
  - (8) Places with analogously deleterious conditions
- The ceramic body of the thermistors is fragile, no excessive pressure or impact shall be exerted on it.
- The thermistors shall not be operated beyond the specified "Operating Temperature Range" in the catalog.

**建议焊接条件**

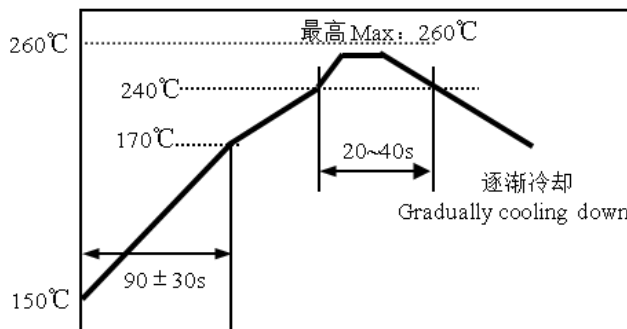
• **回流焊**

- 温升 1~2°C/sec.
- 预热：150~170°C/90±30 sec.
- 大于 240°C时间：20~40sec
- 峰值温度：最高 260°C/10 sec.
- 焊锡：96.5Sn/3.0Ag/0.5Cu
- 回流焊：最多 2 次

**10 Recommended Soldering Technologies**

• **Re-flowing Profile**

- 1~2°C/sec. Ramp
- Pre-heating: 150~170°C/90±30 sec.
- Time above 240°C: 20~40 sec.
- Peak temperature: 260°C Max./10 sec.
- Solder paste: 96.5Sn/3.0Ag/0.5Cu
- Max.2 times for re-flowing



• **手工焊**

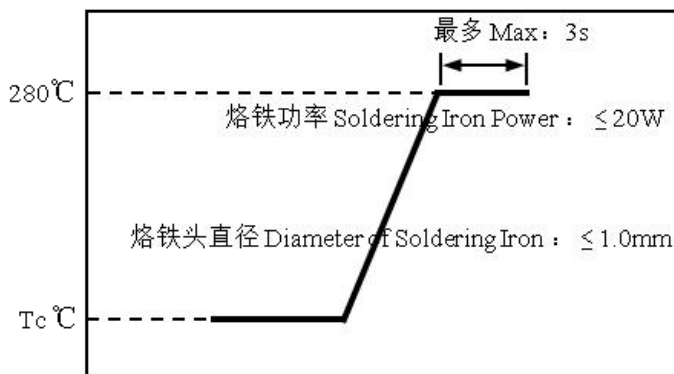
- 烙铁功率：最大 20W
- 预热：150°C/60sec.
- 烙铁头温度：最高 280°C
- 焊接时间：最多 3sec.
- 焊锡：96.5Sn/3.0Ag/0.5Cu
- 手工焊：最多 1 次

• **Iron Soldering Profile**

- Iron soldering power: Max.20W
- Pre-heating: 150°C/60sec.
- Soldering Tip temperature: 280°C Max.
- Soldering time: 3 sec Max.
- Solder paste: 96.5Sn/3.0Ag/0.5Cu
- Max.1 times for iron soldering

[注：不要使烙铁头接触到端头]

[Note: Take care not to apply the tip of the soldering iron to the terminal electrodes.]





R-T 表 R-T table

| 温度<br>Temp. (°C) | R 最小值<br>R_Min (Kohm) | R 中心值<br>R_Cent (Kohm) | R 最大值<br>R_Max (Kohm) | 阻值公差<br>Res TOL. | 温度公差<br>Temp. TOL.(°C) |
|------------------|-----------------------|------------------------|-----------------------|------------------|------------------------|
| -40              | 949.791               | 1,035.824              | 1,126.827             | 8.79%            | 1.26                   |
| -39              | 888.540               | 968.373                | 1,052.740             | 8.71%            | 1.26                   |
| -38              | 831.658               | 905.774                | 984.030               | 8.64%            | 1.26                   |
| -37              | 778.804               | 847.648                | 920.271               | 8.57%            | 1.26                   |
| -36              | 729.668               | 793.646                | 861.075               | 8.50%            | 1.26                   |
| -35              | 683.964               | 743.448                | 806.086               | 8.43%            | 1.26                   |
| -34              | 641.429               | 696.763                | 754.977               | 8.35%            | 1.26                   |
| -33              | 601.825               | 653.321                | 707.450               | 8.29%            | 1.26                   |
| -32              | 564.929               | 612.877                | 663.231               | 8.22%            | 1.26                   |
| -31              | 530.540               | 575.204                | 622.069               | 8.15%            | 1.25                   |
| -30              | 498.472               | 540.096                | 583.732               | 8.08%            | 1.25                   |
| -29              | 468.553               | 507.361                | 548.010               | 8.01%            | 1.25                   |
| -28              | 440.625               | 476.824                | 514.707               | 7.94%            | 1.25                   |
| -27              | 414.544               | 448.324                | 483.644               | 7.88%            | 1.25                   |
| -26              | 390.176               | 421.712                | 454.658               | 7.81%            | 1.25                   |
| -25              | 367.398               | 396.852                | 427.595               | 7.75%            | 1.25                   |
| -24              | 346.050               | 373.567                | 402.263               | 7.68%            | 1.25                   |
| -23              | 326.081               | 351.799                | 378.595               | 7.62%            | 1.25                   |
| -22              | 307.394               | 331.439                | 356.473               | 7.55%            | 1.24                   |
| -21              | 289.897               | 312.389                | 335.785               | 7.49%            | 1.24                   |
| -20              | 273.509               | 294.556                | 316.430               | 7.43%            | 1.24                   |
| -19              | 258.151               | 277.855                | 298.314               | 7.36%            | 1.24                   |
| -18              | 243.754               | 262.206                | 281.350               | 7.30%            | 1.24                   |
| -17              | 230.250               | 247.538                | 265.458               | 7.24%            | 1.24                   |
| -16              | 217.579               | 233.782                | 250.563               | 7.18%            | 1.24                   |
| -15              | 205.686               | 220.877                | 236.598               | 7.12%            | 1.23                   |
| -14              | 194.516               | 208.765                | 223.497               | 7.06%            | 1.23                   |
| -13              | 184.023               | 197.392                | 211.204               | 7.00%            | 1.23                   |
| -12              | 174.160               | 186.710                | 199.662               | 6.94%            | 1.23                   |
| -11              | 164.887               | 176.671                | 188.823               | 6.88%            | 1.23                   |
| -10              | 156.165               | 167.233                | 178.638               | 6.82%            | 1.23                   |
| -9               | 147.957               | 158.357                | 169.065               | 6.76%            | 1.22                   |
| -8               | 140.231               | 150.007                | 160.063               | 6.70%            | 1.22                   |
| -7               | 132.955               | 142.147                | 151.594               | 6.65%            | 1.22                   |
| -6               | 126.101               | 134.747                | 143.625               | 6.59%            | 1.22                   |
| -5               | 119.641               | 127.776                | 136.123               | 6.53%            | 1.22                   |
| -4               | 113.542               | 121.199                | 129.048               | 6.48%            | 1.21                   |
| -3               | 107.791               | 115.000                | 122.383               | 6.42%            | 1.21                   |
| -2               | 102.367               | 109.155                | 116.103               | 6.36%            | 1.21                   |
| -1               | 97.247                | 103.643                | 110.182               | 6.31%            | 1.21                   |
| 0                | 92.415                | 98.442                 | 104.599               | 6.26%            | 1.21                   |
| 1                | 87.856                | 93.538                 | 99.338                | 6.20%            | 1.20                   |

| 温度<br>Temp. (°C) | R 最小值<br>R_Min (Kohm) | R 中心值<br>R_Cent (Kohm) | R 最大值<br>R_Max (Kohm) | 阻值公差<br>Res TOL. | 温度公差<br>Temp. TOL.(°C) |
|------------------|-----------------------|------------------------|-----------------------|------------------|------------------------|
| 2                | 83.549                | 88.907                 | 94.372                | 6.15%            | 1.20                   |
| 3                | 79.478                | 84.533                 | 89.684                | 6.09%            | 1.20                   |
| 4                | 75.629                | 80.399                 | 85.255                | 6.04%            | 1.20                   |
| 5                | 71.989                | 76.491                 | 81.070                | 5.99%            | 1.19                   |
| 6                | 68.539                | 72.788                 | 77.108                | 5.93%            | 1.19                   |
| 7                | 65.274                | 69.287                 | 73.363                | 5.88%            | 1.19                   |
| 8                | 62.184                | 65.975                 | 69.821                | 5.83%            | 1.19                   |
| 9                | 59.258                | 62.840                 | 66.472                | 5.78%            | 1.18                   |
| 10               | 56.487                | 59.873                 | 63.302                | 5.73%            | 1.18                   |
| 11               | 53.864                | 57.065                 | 60.304                | 5.68%            | 1.18                   |
| 12               | 51.377                | 54.404                 | 57.466                | 5.63%            | 1.18                   |
| 13               | 49.020                | 51.883                 | 54.776                | 5.58%            | 1.17                   |
| 14               | 46.783                | 49.493                 | 52.228                | 5.53%            | 1.17                   |
| 15               | 44.662                | 47.226                 | 49.813                | 5.48%            | 1.17                   |
| 16               | 42.647                | 45.075                 | 47.522                | 5.43%            | 1.16                   |
| 17               | 40.735                | 43.034                 | 45.349                | 5.38%            | 1.16                   |
| 18               | 38.920                | 41.097                 | 43.288                | 5.33%            | 1.16                   |
| 19               | 37.195                | 39.259                 | 41.332                | 5.28%            | 1.15                   |
| 20               | 35.557                | 37.512                 | 39.476                | 5.23%            | 1.15                   |
| 21               | 34.000                | 35.853                 | 37.713                | 5.19%            | 1.15                   |
| 22               | 32.520                | 34.277                 | 36.039                | 5.14%            | 1.15                   |
| 23               | 31.113                | 32.779                 | 34.449                | 5.09%            | 1.14                   |
| 24               | 29.774                | 31.355                 | 32.937                | 5.05%            | 1.14                   |
| 25               | 28.500                | 30.000                 | 31.500                | 5.00%            | 1.14                   |
| 26               | 27.264                | 28.711                 | 30.160                | 5.05%            | 1.15                   |
| 27               | 26.088                | 27.485                 | 28.885                | 5.09%            | 1.17                   |
| 28               | 24.969                | 26.318                 | 27.670                | 5.14%            | 1.19                   |
| 29               | 23.904                | 25.206                 | 26.513                | 5.18%            | 1.21                   |
| 30               | 22.891                | 24.148                 | 25.410                | 5.23%            | 1.22                   |
| 31               | 21.926                | 23.140                 | 24.360                | 5.27%            | 1.24                   |
| 32               | 21.007                | 22.180                 | 23.359                | 5.32%            | 1.26                   |
| 33               | 20.132                | 21.264                 | 22.405                | 5.36%            | 1.28                   |
| 34               | 19.298                | 20.392                 | 21.494                | 5.41%            | 1.30                   |
| 35               | 18.502                | 19.560                 | 20.626                | 5.45%            | 1.32                   |
| 36               | 17.744                | 18.766                 | 19.797                | 5.49%            | 1.34                   |
| 37               | 17.021                | 18.009                 | 19.006                | 5.54%            | 1.35                   |
| 38               | 16.332                | 17.286                 | 18.251                | 5.58%            | 1.37                   |
| 39               | 15.674                | 16.597                 | 17.530                | 5.62%            | 1.39                   |
| 40               | 15.046                | 15.938                 | 16.841                | 5.67%            | 1.41                   |
| 41               | 14.446                | 15.309                 | 16.183                | 5.71%            | 1.43                   |
| 42               | 13.874                | 14.708                 | 15.554                | 5.75%            | 1.45                   |
| 43               | 13.327                | 14.134                 | 14.953                | 5.79%            | 1.47                   |
| 44               | 12.805                | 13.586                 | 14.378                | 5.84%            | 1.49                   |
| 45               | 12.305                | 13.061                 | 13.829                | 5.88%            | 1.51                   |

| 温度<br>Temp. (°C) | R 最小值<br>R_Min (Kohm) | R 中心值<br>R_Cent (Kohm) | R 最大值<br>R_Max (Kohm) | 阻值公差<br>Res TOL. | 温度公差<br>Temp. TOL.(°C) |
|------------------|-----------------------|------------------------|-----------------------|------------------|------------------------|
| 46               | 11.829                | 12.560                 | 13.304                | 5.92%            | 1.53                   |
| 47               | 11.373                | 12.081                 | 12.801                | 5.96%            | 1.55                   |
| 48               | 10.937                | 11.623                 | 12.320                | 6.00%            | 1.57                   |
| 49               | 10.521                | 11.184                 | 11.860                | 6.04%            | 1.59                   |
| 50               | 10.122                | 10.765                 | 11.419                | 6.08%            | 1.61                   |
| 51               | 9.741                 | 10.363                 | 10.997                | 6.12%            | 1.63                   |
| 52               | 9.375                 | 9.978                  | 10.593                | 6.16%            | 1.65                   |
| 53               | 9.026                 | 9.610                  | 10.206                | 6.20%            | 1.67                   |
| 54               | 8.691                 | 9.257                  | 9.835                 | 6.24%            | 1.69                   |
| 55               | 8.371                 | 8.919                  | 9.479                 | 6.28%            | 1.71                   |
| 56               | 8.063                 | 8.595                  | 9.138                 | 6.32%            | 1.73                   |
| 57               | 7.769                 | 8.284                  | 8.811                 | 6.36%            | 1.75                   |
| 58               | 7.487                 | 7.986                  | 8.497                 | 6.40%            | 1.77                   |
| 59               | 7.217                 | 7.701                  | 8.196                 | 6.44%            | 1.79                   |
| 60               | 6.957                 | 7.427                  | 7.908                 | 6.48%            | 1.81                   |
| 61               | 6.709                 | 7.164                  | 7.631                 | 6.51%            | 1.84                   |
| 62               | 6.471                 | 6.913                  | 7.365                 | 6.55%            | 1.86                   |
| 63               | 6.243                 | 6.671                  | 7.111                 | 6.59%            | 1.88                   |
| 64               | 6.024                 | 6.439                  | 6.866                 | 6.63%            | 1.90                   |
| 65               | 5.813                 | 6.216                  | 6.631                 | 6.67%            | 1.92                   |
| 66               | 5.611                 | 6.002                  | 6.404                 | 6.70%            | 1.94                   |
| 67               | 5.417                 | 5.796                  | 6.187                 | 6.74%            | 1.96                   |
| 68               | 5.230                 | 5.598                  | 5.978                 | 6.78%            | 1.99                   |
| 69               | 5.051                 | 5.408                  | 5.777                 | 6.81%            | 2.01                   |
| 70               | 4.878                 | 5.226                  | 5.584                 | 6.85%            | 2.03                   |
| 71               | 4.714                 | 5.051                  | 5.399                 | 6.89%            | 2.05                   |
| 72               | 4.555                 | 4.883                  | 5.221                 | 6.92%            | 2.08                   |
| 73               | 4.403                 | 4.721                  | 5.050                 | 6.96%            | 2.10                   |
| 74               | 4.257                 | 4.566                  | 4.885                 | 7.00%            | 2.12                   |
| 75               | 4.116                 | 4.416                  | 4.727                 | 7.03%            | 2.14                   |
| 76               | 3.980                 | 4.272                  | 4.574                 | 7.07%            | 2.17                   |
| 77               | 3.849                 | 4.133                  | 4.427                 | 7.10%            | 2.19                   |
| 78               | 3.724                 | 4.000                  | 4.285                 | 7.14%            | 2.21                   |
| 79               | 3.603                 | 3.871                  | 4.148                 | 7.17%            | 2.23                   |
| 80               | 3.486                 | 3.747                  | 4.017                 | 7.21%            | 2.26                   |
| 81               | 3.375                 | 3.628                  | 3.891                 | 7.24%            | 2.28                   |
| 82               | 3.267                 | 3.513                  | 3.769                 | 7.28%            | 2.30                   |
| 83               | 3.163                 | 3.403                  | 3.652                 | 7.31%            | 2.33                   |
| 84               | 3.063                 | 3.296                  | 3.539                 | 7.34%            | 2.35                   |
| 85               | 2.967                 | 3.194                  | 3.429                 | 7.38%            | 2.37                   |
| 86               | 2.874                 | 3.095                  | 3.324                 | 7.41%            | 2.40                   |
| 87               | 2.785                 | 3.000                  | 3.223                 | 7.45%            | 2.42                   |
| 88               | 2.698                 | 2.908                  | 3.125                 | 7.48%            | 2.45                   |
| 89               | 2.615                 | 2.819                  | 3.031                 | 7.51%            | 2.47                   |

| 温度<br>Temp. (°C) | R 最小值<br>R_Min (Kohm) | R 中心值<br>R_Cent (Kohm) | R 最大值<br>R_Max (Kohm) | 阻值公差<br>Res TOL. | 温度公差<br>Temp. TOL.(°C) |
|------------------|-----------------------|------------------------|-----------------------|------------------|------------------------|
| 90               | 2.535                 | 2.733                  | 2.940                 | 7.55%            | 2.49                   |
| 91               | 2.458                 | 2.651                  | 2.852                 | 7.58%            | 2.52                   |
| 92               | 2.383                 | 2.571                  | 2.767                 | 7.61%            | 2.54                   |
| 93               | 2.311                 | 2.494                  | 2.685                 | 7.64%            | 2.57                   |
| 94               | 2.242                 | 2.420                  | 2.606                 | 7.68%            | 2.59                   |
| 95               | 2.175                 | 2.348                  | 2.529                 | 7.71%            | 2.62                   |
| 96               | 2.110                 | 2.279                  | 2.456                 | 7.74%            | 2.64                   |
| 97               | 2.048                 | 2.213                  | 2.385                 | 7.77%            | 2.67                   |
| 98               | 1.988                 | 2.149                  | 2.316                 | 7.81%            | 2.69                   |
| 99               | 1.930                 | 2.086                  | 2.250                 | 7.84%            | 2.72                   |
| 100              | 1.874                 | 2.026                  | 2.186                 | 7.87%            | 2.74                   |
| 101              | 1.820                 | 1.968                  | 2.124                 | 7.90%            | 2.77                   |
| 102              | 1.767                 | 1.912                  | 2.064                 | 7.93%            | 2.79                   |
| 103              | 1.717                 | 1.858                  | 2.006                 | 7.96%            | 2.82                   |
| 104              | 1.668                 | 1.806                  | 1.950                 | 7.99%            | 2.84                   |
| 105              | 1.621                 | 1.755                  | 1.896                 | 8.02%            | 2.87                   |
| 106              | 1.575                 | 1.706                  | 1.843                 | 8.05%            | 2.89                   |
| 107              | 1.531                 | 1.658                  | 1.793                 | 8.08%            | 2.92                   |
| 108              | 1.488                 | 1.613                  | 1.743                 | 8.11%            | 2.95                   |
| 109              | 1.446                 | 1.568                  | 1.696                 | 8.15%            | 2.97                   |
| 110              | 1.406                 | 1.525                  | 1.650                 | 8.18%            | 3.00                   |
| 111              | 1.368                 | 1.484                  | 1.605                 | 8.21%            | 3.02                   |
| 112              | 1.330                 | 1.443                  | 1.562                 | 8.23%            | 3.05                   |
| 113              | 1.294                 | 1.404                  | 1.520                 | 8.26%            | 3.08                   |
| 114              | 1.259                 | 1.367                  | 1.480                 | 8.29%            | 3.10                   |
| 115              | 1.225                 | 1.330                  | 1.441                 | 8.32%            | 3.13                   |
| 116              | 1.192                 | 1.295                  | 1.403                 | 8.35%            | 3.16                   |
| 117              | 1.160                 | 1.261                  | 1.366                 | 8.38%            | 3.18                   |
| 118              | 1.129                 | 1.228                  | 1.331                 | 8.41%            | 3.21                   |
| 119              | 1.100                 | 1.196                  | 1.296                 | 8.44%            | 3.24                   |
| 120              | 1.071                 | 1.164                  | 1.263                 | 8.47%            | 3.26                   |
| 121              | 1.043                 | 1.134                  | 1.231                 | 8.50%            | 3.29                   |
| 122              | 1.016                 | 1.105                  | 1.199                 | 8.52%            | 3.32                   |
| 123              | 0.989                 | 1.077                  | 1.169                 | 8.55%            | 3.35                   |
| 124              | 0.964                 | 1.049                  | 1.139                 | 8.58%            | 3.37                   |
| 125              | 0.939                 | 1.023                  | 1.111                 | 8.61%            | 3.40                   |