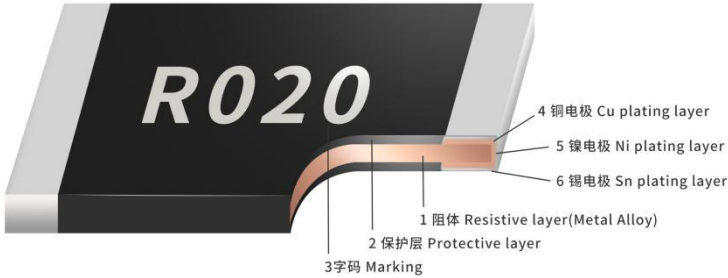


纯合金高功率电流检测电阻, 用于电流检测,SMD 贴片安装,高功率,超低阻值(低至 0.0R)

| ■ 产品图示                                                                            | ■ 产品结构图                                                                            |
|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|  |  |

| ■ 产品特点 Features                                                                                      | ■ 应用领域 Applications                                |
|------------------------------------------------------------------------------------------------------|----------------------------------------------------|
| ■ 寄生电感≤5nH<br>The parasitic inductance is less than or equal to 5 nH.                                | ■ 汽车电子<br>Automotive electronics                   |
| ■ 超低阻值, 优异的电阻温度系数<br>Ultra-low resistance values. Excellent temperature coefficient characteristics. | ■ 电流传感器、电源供应器<br>Current sensor、Power supplies     |
| ■ 符合 AEC-Q200 条款<br>The relevant provisions of the AEC-Q200                                          | ■ 充电器<br>Battery chargers                          |
| ■ 通过: RoHS REACH 认证<br>Passed: RoHS REACH certification                                              | ■ 手机、电脑、消费性电子<br>Mobile phones、Computers 、Consumer |

| ■ 料号标识:示例 RE1206FR100 = RE 系列 1206 尺寸 1W 1% 100mΩ |                                 |                                      |                                                               |                                                                          |
|---------------------------------------------------|---------------------------------|--------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------|
| RE                                                | 1206                            | F                                    | 1                                                             | R100                                                                     |
| 产品系列 Type                                         | 尺寸 Size<br>1206<br>2512<br>0805 | 公差 Tolerance<br>F:1%<br>G:2%<br>J:5% | 额定功率 Rated Power<br>A=1/2W<br>B= 3/4W<br>1=1W<br>2=2W<br>3=3W | 阻值 Resistance Value<br>R50m=0.5mΩ<br>R002=2mΩ<br>R010=10mΩ<br>1R5m=1.5mΩ |

### ■ 电阻值范围及电气特性(Resistance Range and Electrical Characteristics)

| 尺寸<br>Size | 类别<br>Type | 最高额定功率(W)<br>Rated Power | 阻值精度<br>Resistance tolerance | 阻值范围(mΩ)<br>Resistance Range |
|------------|------------|--------------------------|------------------------------|------------------------------|
| 1206       | 小电极        | 1W                       | F:1%<br>G:2%<br>J:5%         | R000~R100                    |

| 尺寸<br>Size | 类别<br>Type | 最高额定功率(W)<br>Rated Power | 温度系数 TCR<br>(ppm/°C)                            |                                    | 工作温度范围(mΩ)<br>Operating temperature range   | 绝缘阻抗<br>Insulation Resistance |
|------------|------------|--------------------------|-------------------------------------------------|------------------------------------|---------------------------------------------|-------------------------------|
| 1206       | 小电极        | 1W                       | $0\text{m}\Omega \leq R < 3\text{m}\Omega$      | $\pm 350\text{ppm}/^\circ\text{C}$ | $-55^\circ\text{C} \sim +170^\circ\text{C}$ | $\geq 100\text{M}\Omega$      |
|            |            |                          | $3\text{m}\Omega \leq R \leq 100\text{m}\Omega$ | $\pm 50\text{ppm}/^\circ\text{C}$  |                                             |                               |

### ■ 字码标示(Marking on the Resistor's Body)

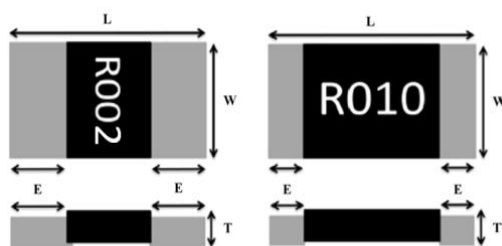
图例



R020=20mΩ

| 阻值    | 代码   | 阻值   | 代码   | 阻值    | 代码   | 阻值    | 代码   |
|-------|------|------|------|-------|------|-------|------|
| 0.5mΩ | R50m | 25mΩ | R025 | 80mΩ  | R080 | 200mΩ | R200 |
| 1mΩ   | R001 | 30mΩ | R030 | 90mΩ  | R090 | 220mΩ | R220 |
| 1.5mΩ | 1R5m | 35mΩ | R035 | 100mΩ | R100 | 250mΩ | R250 |
| 2mΩ   | R002 | 40mΩ | R040 | 120mΩ | R120 | 270mΩ | R270 |
| 3mΩ   | R003 | 50mΩ | R040 | 130mΩ | R130 | 300mΩ | R300 |
| 5mΩ   | R005 | 57mΩ | R057 | 140mΩ | R140 | 330mΩ | R330 |
| 10mΩ  | R010 | 60mΩ | R060 | 150mΩ | R150 | 360mΩ | R360 |
| 15mΩ  | R015 | 68mΩ | R068 | 160mΩ | R160 | 400mΩ | R400 |
| 20mΩ  | R020 | 75mΩ | R075 | 180mΩ | R180 | 500mΩ | R500 |

## ■ 产品尺寸 (dimension)

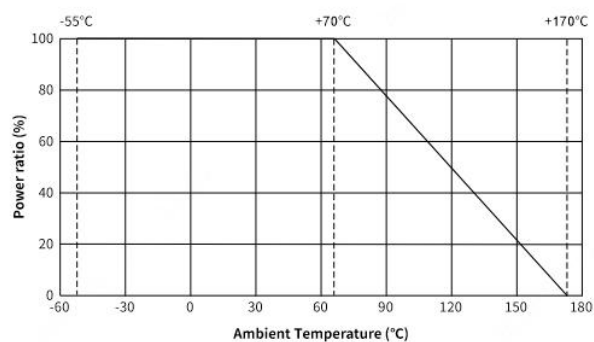


大电极

小电极

| 尺寸<br>Size | 类型<br>Type | 长<br>L(mm)    | 宽<br>W(mm)    | 厚<br>T(mm)                                                       | 电极宽<br>E(mm)  |
|------------|------------|---------------|---------------|------------------------------------------------------------------|---------------|
| 1206       | 大电极        | $3.2 \pm 0.2$ | $3.2 \pm 0.2$ | $0.7 \pm 0.2$ ( $R \leq R006$ )<br>$0.55 \pm 0.2$ ( $R > R006$ ) | $0.6 \pm 0.2$ |

## ■ 功率衰减曲线



工作温度范围 (Operating Temperature Range) :  $-55^{\circ}\text{C} \sim +170^{\circ}\text{C}$ 。  
当电阻在高于  $70^{\circ}\text{C}$  的周围环境中工作时, 最大负载功率应该按照以上曲线减少。

When the resistor is operating in an ambient environment above  $70^{\circ}\text{C}$ , the maximum load power should be reduced according to the above curve.

## ■ 额定电流

额定电流计算方式如下

(The rated current is calculated by the following formula) :

$$I = \sqrt{P/R}$$

I: 额定电流 (Rated current) (A)

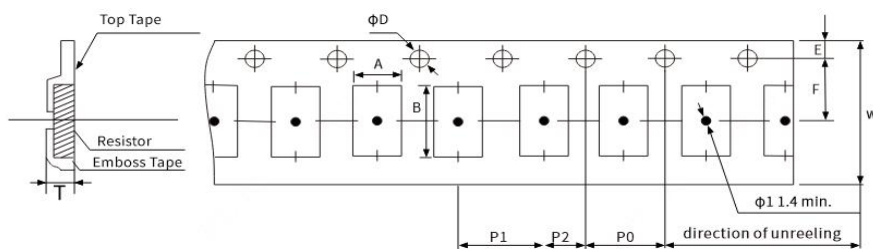
P: 额定功率 (Rated Power) (W)

R: 额定电阻 (Resistance) (ohm)

如果计算出的电流超过此型别的最大工作电流, 则此型别的最大工作电流为此电阻的额定电流

(In case the value calculated by the formula exceed the maximum working current as above table, the maximum working current shall be regarded as rated current.)

## ■ 包装尺寸 (packing dimension)

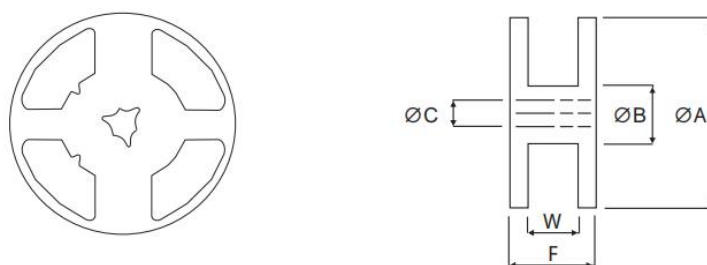


单位: mm

| Type | Packing | A         | B       | W        | F        | E        | P0       | P1      | P2       | ΦD0      | T         |
|------|---------|-----------|---------|----------|----------|----------|----------|---------|----------|----------|-----------|
| 2512 | Emboss  | 3.5±0.15  | 6.8±0.2 | 12.0±0.2 | 5.5±0.05 | 1.75±0.1 | 4.0±0.1  | 4.0±0.1 | 2.0±0.05 | 1.5±0.10 | 1.0±0.1   |
| 1206 | Emboss  | 2.0±0.15  | 3.6±0.2 | 8.0±0.2  | 3.5±0.05 | 1.75±0.1 | 4.0±0.05 | 4.0±0.1 | 2.0±0.05 | 1.5±0.10 | 0.87±0.05 |
| 0805 | Emboss  | 1.65±0.05 | 2.4±0.2 | 8.0±0.2  | 3.5±0.05 | 1.75±0.1 | 4.0±0.05 | 4.0±0.1 | 2.0±0.05 | 1.5±0.10 | 0.8±0.05  |

## ■ 包装规格 (Tapping Specification)

### 卷盘尺寸 (reel dimension)



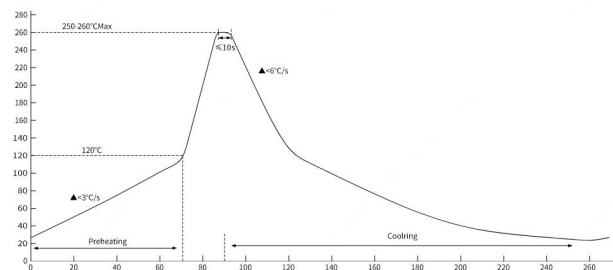
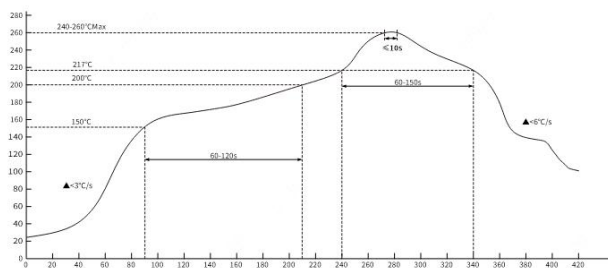
单位: mm

| 尺寸<br>Dimensions | ΦA       | ΦB         | ΦC         | FΦ         | W          | Q' ty/R |
|------------------|----------|------------|------------|------------|------------|---------|
| 1206             | 178±2.00 | 60.00±1.00 | 13.00±1.00 | 11.40±0.50 | 9.00±0.30  | 5000    |
| 2512             | 178±2.00 | 60.00±1.00 | 13.00±1.00 | 15.40±0.5  | 13.30±0.50 | 4000    |
| 0805             | 178±2.00 | 60.00±1.00 | 13.00±1.00 | 11.40±0.50 | 9.00±0.30  | 5000    |

Diagram illustrating the peeling direction for the carrier tape. The carrier tape is shown being peeled away from the top tape at an angle of  $165^{\circ} \sim 180^{\circ}$ . The peeling direction is indicated by an arrow labeled "peeling direction" and "拉力方向". The carrier tape is labeled "纸带 carrier tape" and the top tape is labeled "面胶 top tape". The bottom tape is labeled "底带 bottom tape".

The top cover tape is pulled at a speed of 300 mm/min with the angle between the tape during peel and the direction of unreeling maintained at 165 to 180 degree as following picture. The peel force of paper carrier tape shall be 0.1N to 0.7N(10 to 70 g), the peel force of plastic carrier tape shall be 0.3N to 1N (30 to 100 g).

### 波峰焊 Wave-Soldering Profile



单位: mm

|      |      |     |     |     |
|------|------|-----|-----|-----|
| 尺寸   | 阻值范围 | a   | b   | L   |
| 1206 | 小电极  | 1.8 | 1.7 | 1.6 |

### ■ 信赖性试验项目 (Performance Reliability Test Methods)

| 项目                                   | 测试方法                      | 条件                                                                                                                                                                                                                                                                                                                    | 规格                                  |
|--------------------------------------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|
| 短时间过负荷<br>Short Time<br>Overload     | IEC60115-1 4.13           | 施加过负荷 5 秒, 静置 5 秒后再测量试验前后的阻值变化率。<br>Applied 5.0 times of rated power for 5 second.<br>Measure the variation of resistance.<br>$\Delta R\% = (R_2 - R_1) / R_1 \times 100\%$<br>R1 = 试验前阻值(resistance before test)<br>R2 = 试验后阻值(resistance after test)                                                                | $\leq \pm 1\%$                      |
| 温度系数<br>Temperature<br>Coefficient   | IEC60115-1 4.8            | $T_{CR} = (R - R_0) / (t - t_0) R_0 \times 10^6$ (ppm)<br>R <sub>0</sub> 电阻在室温下的阻值(resistance at room temperature)<br>R 电阻在 +125 °C 或 +155 °C 下的阻值<br>(resistance at +125°C or +155°C) t <sub>0</sub> 室温(room temperature)<br>t 测试温度 (test temperature +125°C or +155°C)                                              | 请参考特性规格表, Please refer to the Spec. |
| 温度循环<br>Temperature<br>cycling       | JESD22<br>Method JA-104   | -55°C/+125°C, 循环 1000 次, 试验结束 24±4 小时后测量试验前后阻值变化率。<br>1000Cycles (-55°C to +125°C) Measurement at 24±4 hours after test conclusion. Measure the variation of resistance at 24±4 hours after test conclusion.                                                                                                          | $< \pm 1\%$                         |
| 高温储存<br>High Temperature<br>Exposure | MIL-STD-202<br>Method 108 | 125°C下放置 1000H, 试验结束 24±4 小时后测量试验前后阻值变化率。<br>1000 hrs. @T=125°C. Measure the variation of resistance at 24±4 hours after test conclusion.                                                                                                                                                                             | $< \pm 1\%$                         |
| 低温储存<br>Low Temperature<br>operation | IEC60115-1<br>4.23.4      | -55°C下放置 45 分钟, 后测量试验前后阻值变化率。<br>45 min. @T=-55°C. Measure the variation of resistance after test conclusion                                                                                                                                                                                                          | $< \pm 1\%$                         |
| 高温高湿<br>Biased Humidit               | MIL-STD-202<br>METHOD 103 | 加载 10%额定功率, 85°C/85%RH, 持续通电 1000H,试验结束 24±4 小时后进行测试<br>1000 hours 85°C/85%RH.<br>Note: Specified conditions: 10% of operating power.<br>Measurement at 24±4 hours after test conclusion.<br>$\Delta R\% = (R_2 - R_1) / R_1 \times 100\%$<br>R1 = 试验前阻值(resistance before test)<br>R2 = 试验后阻值(resistance after test) | $\leq \pm 1\%$                      |
| 可焊性<br>Solderability                 | J-STD-002B<br>test B      | 沾助焊剂后浸入锡炉, 锡炉温度 245±5°C, 时间 2~3 秒<br>Dip the terminal in a flux and then dip into a soldering bath at 245 ±5°C for 2~3sec.                                                                                                                                                                                            | 电极覆新锡面积需大于 95%(Min 95% coverage)    |

| ■ 信赖性试验项目 (Performance Reliability Test Methods) |                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                         |
|--------------------------------------------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| 项目                                               | 测试方法                      | 条件                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 规格                      |
| 负荷寿命<br>Operational life                         | MIL-STD-202<br>METHOD 108 | 电阻放入恒温箱中, 温度 $70 \pm 2^{\circ}\text{C}$ , 通电额定电 流 1.5 小时, 断电 0.5 小时; 重复通断电至试验时间 $1000 + 48/-0$ 小时. 测量试验前后阻值变化率.<br><br>Put the specimen in a chamber at $70 \pm 2^{\circ}\text{C}$ temperature , and applied rated currernt for 1.5H and rested for 0.5H repeatedly till total test time is $1000 + 48/-0$ .. Measure the variation of resistance.<br><br>$\Delta R\% = (R_2 - R_1) / R_1 * 100\%$<br>R1 = 试验前阻值(resistance before test)<br>R2 = 试验后阻值(resistance after test) | $\leq \pm 1\%$          |
| 振动<br>Resistance to vibration                    | MIL-STD-202<br>METHOD 204 | 5g's 的力 20 分钟, 12 个循环, 测试频率从 10-2000 赫兹, 测量试验前后阻值变化率。<br>5g's for 20min.12cycles, 10-2000Hz . Measure the variation of resistance.                                                                                                                                                                                                                                                                                                                                            | $\leq \pm 1\%$          |
| 抗焊锡热<br>Resistance to Solder Heat                | IEC60115-1 4.18           | 沾助焊剂后浸入锡炉, 锡炉温度 $260 \pm 5^{\circ}\text{C}$ , 时间 $10 \pm 1$ 秒, 测量试验前后的阻值变化率。<br>Dip the terminal in a flux and then dip into a soldering bath at $260 \pm 5^{\circ}\text{C}$ for $10 \pm 1$ sec. Measure the variation of resistance.                                                                                                                                                                                                                                         | $\leq \pm 1\%$<br>外观无损伤 |
| 端子弯曲<br>Terminal bending                         | AEC-Q200-005              | 弯曲 2mm, 60 秒, 测量试验前后阻值变化率。<br>Min 2mm deflection, 60sec. Measure the variation of resistance. Measure the variation of resistance.                                                                                                                                                                                                                                                                                                                                            | $\leq \pm 1\%$          |
| 机械冲击<br>Mechanical Shock                         | MIL-STD-202<br>METHOD 213 | 半正弦, 100g's, 震动 6ms, 速度 12.3 ft/s100Hz, 测量试验前后阻值变化率。<br>100g's , Normal duration is 6ms , half sine shock pulse. Measure the variation of resistance.                                                                                                                                                                                                                                                                                                                         | $\leq \pm 1\%$          |
| 端子强度<br>Terminal Strength                        | AEC-Q200-006              | 应用 17.7N (1.8Kg), 时间 $60 \pm 1$ 秒<br>Applied a 17.7N (1.8Kg) for $60 \pm 1$ seconds.                                                                                                                                                                                                                                                                                                                                                                                          | $\leq \pm 1\%$          |
| 冷热冲击<br>Thermal shock                            | MIL-STD-202<br>METHOD 107 | 温度 $-55/+125^{\circ}\text{C}$ , 周期数是 300, 设备安装。最大传 输时间是 20 秒。停留 15 分钟, 测量试验前后阻值 变化率。<br>Use $-55/+125^{\circ}\text{C}$ , Number of cycles is 300. Devices mounted. Maximum transfer time is 20 seconds. Dwell time is 15 minutes. Air -Air. Measure the variation of resistance.                                                                                                                                                                                              | $\leq \pm 1\%$          |
| 阻燃性<br>Flammability                              | UL-94                     | V-0 or V-1 可接受的, 电器特性测试不要求<br>V-0 or V-1 are acceptable. Electrical test not required.                                                                                                                                                                                                                                                                                                                                                                                        | $\leq \pm 1\%$          |
| ESD 试验<br>ESD test                               | AEC-Q200-002              | 加载规定静电电压 2KV, 2 次/间隔 1 秒<br>2KV, 2times/1s                                                                                                                                                                                                                                                                                                                                                                                                                                    | $\leq \pm 1\%$          |