



## 功率型厚膜片式电阻器

THICK FILM CHIP RESISTOR WITH HIGH POWER

### ■ 特长 Features

- 高功率
- 体积小、重量轻。
- 适应再流焊与波峰焊。
- 电性能稳定，可靠性高。
- 装配成本低，并与自动装贴设备匹配。
- 适于作电流探测用电阻器，如电源电路、发动机用电路等。
- 机械强度高、高频特性优越
- 符合 ROHS 指令要求
- High power.
- Miniature and light weight.
- Suit for reflow and wave flow solder.
- Stable electrical capability,high reliability.
- Low assembly cost,suit for automatic SMT equipment.
- Current detecting resistors for power supply, motor circuits,etc.
- Superior mechanical and frequency characteristics.
- According with RoHS standard



### ■ 品名构成 Type Designation

例 Example

RP

J

1218

M

R047

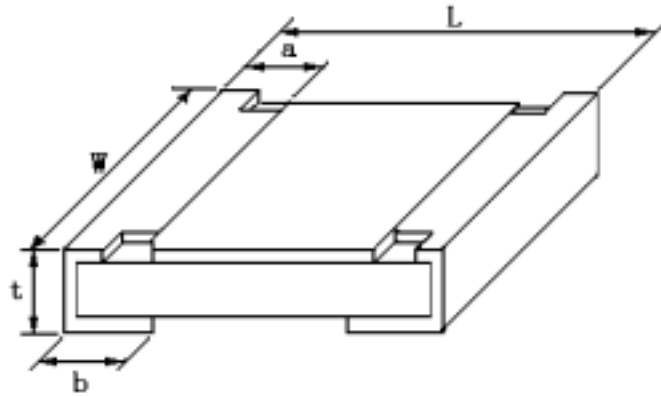
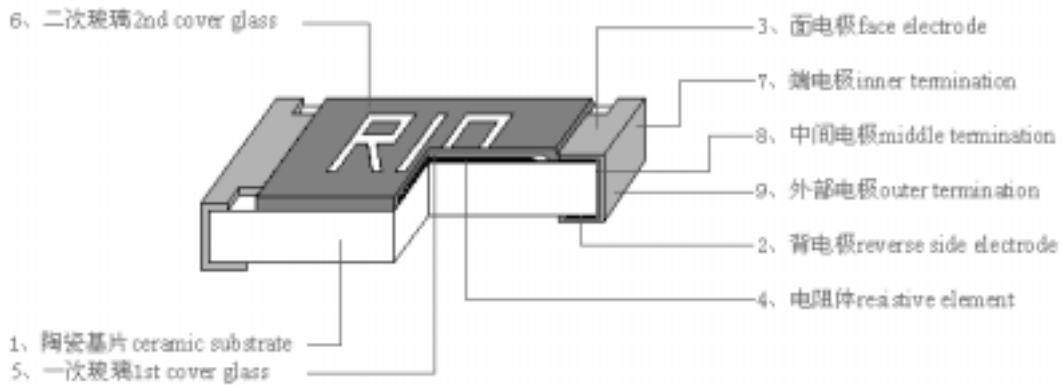
J

T

| 产品代号<br>Product Code | 额定功率系列代号<br>Power Rating Series Code |      | 型号代号<br>Type Code |      | 电阻温度系数代号<br>Resistance Temperature Coefficient Code |                  | 电阻值代号<br>Resistance Value Code |   | 电阻值误差精度代号<br>Resistance Tolerance Code |     | 包装方式代号<br>Packaging Style Code |                 |
|----------------------|--------------------------------------|------|-------------------|------|---|------------------|--------------------------------|---|--|-----|--------------------------------|-----------------|
|                      | RP                                   | E    | 1/8W              | 03   | 0603  | L                | ±250 PPM/°C                    | 小数点用 R 表示. Decimal point should be expressed by "R"<br>例如 Example:<br>R22=0.22Ω<br>R10=0.30Ω<br>R047=0.047Ω |  | D   | 0.5%                           | T               |
|                      | F                                    | 1/4W | 05                | 0805 | K   | ±100 PPM/°C      | F                              |   |  | 1%  | B                              | 盒装<br>Bulk Case |
|                      | G                                    | 1/2W | 06                | 1206 | M   | ±500 PPM/°C      | G                              |   |  | 2%  |                                |                 |
|                      | H                                    | 3/4W | 1210              | 1210 | N   | -100~+400 PPM/°C | J                              |   |  | 5%  |                                |                 |
|                      | J                                    | 1W   | 1218              | 1218 | S   | ±1000 PPM/°C     | K                              |   |  | 10% | C                              | 塑料袋<br>Case     |
|                      |                                      |      | 1812              | 1812 |   |                  |                                |   |  |     |                                |                 |
|                      |                                      |      | 10                | 2010 |   |                  |                                |   |  |     |                                |                 |
|                      |                                      |      | 12                | 2512 |   |                  |                                |   |  |     |                                |                 |



■ 结构及规格尺寸 Construction and dimension



单位 Unit: mm

| 型号 Type | L         | W         | t         | a         | b         |
|---------|-----------|-----------|-----------|-----------|-----------|
| 0603    | 1.60±0.15 | 0.80±0.15 | 0.40±0.10 | 0.30±0.20 | 0.30±0.20 |
| 0805    | 2.00±0.20 | 1.25±0.15 | 0.50±0.10 | 0.40±0.20 | 0.40±0.20 |
| 1206    | 3.20±0.20 | 1.60±0.15 | 0.55±0.10 | 0.50±0.20 | 0.50±0.20 |
| 1210    | 3.20±0.20 | 2.50±0.20 | 0.55±0.10 | 0.50±0.20 | 0.50±0.20 |
| 1218    | 3.15±0.15 | 4.60±0.20 | 0.55±0.10 | 0.37±0.20 | 0.65±0.20 |
| 1812    | 4.50±0.20 | 3.20±0.20 | 0.55±0.10 | 0.50±0.20 | 0.50±0.20 |
| 2010    | 5.00±0.20 | 2.50±0.20 | 0.55±0.10 | 0.60±0.20 | 0.60±0.20 |
| 2512    | 6.40±0.20 | 3.20±0.20 | 0.55±0.10 | 0.60±0.20 | 0.60±0.20 |



## ■产品外观 Appearance

1. 电阻器表面二次玻璃体保护膜覆盖完好且难以脱落, 表面平整。

The surface of resistor is covered with Protective Coating which hard to fade, and the surface of coating should avoid unevenness.

2. 电阻器引出端电极覆盖均匀、镀层较难脱落, 且平整、无裂痕、针孔、变色。

The terminal part is covered equable, the plating is hard to fade, and should avoid unevenness, flaw, pinhole and discoloration.

3. 电阻器芯片无裂痕、标志可辨。

With a clear mark, the resistor body is crack-free.

4. 0603 规格当  $R < 0.1 \Omega$ , 标记用实际的阻值加“V”。如 V47 表示  $47m\Omega$ 。

0603 type: Denotes the actual resistance .for example: V47= $47m\Omega$

## ■ 参考标准 Reference Standard

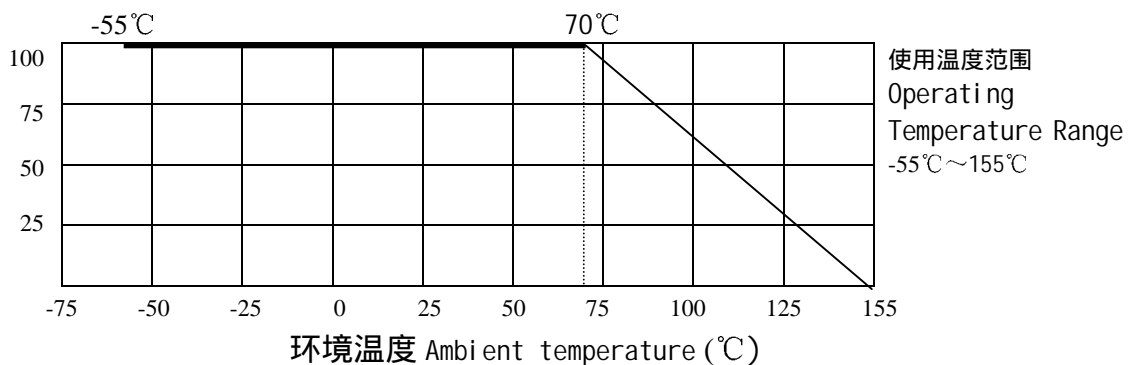
GB/T 5729-2003

GB/T 9546-1995

JIS C 5223-1995

JIS C 5201-1994

## ■ 负荷下降曲线 Derating Curve



当电阻使用的环境温度超过  $70^{\circ}\text{C}$  时, 其额定负荷 (额定功率) 按上述曲线下降。

For resistors operated in ambient over  $70^{\circ}\text{C}$ , rated load (power rating) shall be derated in accordance with the above figure.



■ **额定值 Ratings**

| 项目 Item                                      | 0603   | 0805       | 1206       | 1210       | 1218       | 1812       | 2010       | 2512       |
|--|--|------------|------------|------------|------------|------------|------------|------------|
| 额定功率<br>Power Rating                         | 1/8W   | 1/4W       | 1/2W       | 1/2W       | 1W         | 3/4W       | 1W         | 1W         |
| 额定电流<br>Rating Current                       | 0.36~2.50A   | 0.51~3.54A | 0.72~5.00A | 0.72~5.00A | 1.01~7.07A | 0.88~6.12A | 1.01~7.07A | 1.01~7.07A |
| 阻值范围<br>Resistance Range                     | $0.02\ \Omega \leq R < 1\ \Omega$                    |            |            |            |            |            |            |            |
| 电阻温度系数<br>Resistance Temperature Coefficient | $\pm 500\ \text{PPM}/^\circ\text{C}$                 |            |            |            |            |            |            |            |
| 阻值误差精度<br>Resistance Tolerance               | $\pm 1\% \quad \pm 2\% \quad \pm 5\% \quad \pm 10\%$ |            |            |            |            |            |            |            |
| 使用温度范围<br>Operating Temperature Range        | $-55^\circ\text{C} \sim +125^\circ\text{C}$          |            |            |            |            |            |            |            |
| 额定温度<br>Rated Temperature                    | $+70^\circ\text{C}$                                  |            |            |            |            |            |            |            |

注：额定电压 =  $\sqrt{\text{额定功率} \times \text{标称电阻值}}$  或最大工作电压两者中的较小值。

Note: Rated Voltage =  $\sqrt{\text{Power Rating} \times \text{Resistance Value}}$  or Max. Working Voltage, whichever is lower.

■ **特性 Characteristics**

| 项目<br>Item                    | 标准<br>Specifications   | 测试方法 (JIS C 5202 标准)<br>Test Methods (JIS C 5202)   |
|-------------------------------|--|---|
| 端头强度<br>Bending Strength      | 无可见损伤 No mechanical damage<br>$\Delta R \leq \pm (1.0\%R + 0.005\ \Omega)$ | 弯曲速度 (Speed): 1mm/s<br>弯曲距离 (Bending Distance):<br>0603、0805、1206、1210、1218: 3mm;<br>1812、2010、2512: 1mm  |
| 电阻温度系数<br>T.C.R               | 在规定值内<br>within specified T.C.R  | $-55^\circ\text{C} \sim +125^\circ\text{C}$   |
| 温度循环<br>Temperature Cycling   | 无可见损伤 No mechanical damage<br>$\Delta R \leq \pm (1.0\%R + 0.005\ \Omega)$ | $-55^\circ\text{C}$ (30分钟) ~ 常温 (5分钟) ~ $125^\circ\text{C}$ (30分钟) 5个循环<br>$-55^\circ\text{C}$ (30min) ~ normal temperature (5min) ~ $125^\circ\text{C}$ (30min) 5 cycles |
| 短时间过负载<br>Short Time Overload | 无可见损伤 No mechanical damage<br>$\Delta R \leq \pm (2.0\%R + 0.005\ \Omega)$ | 2.5倍额定电流或最大过负荷电流 (取最小者) 保持5秒<br>$2.5 \times \text{Rated Current}$ or Max. Overload Current, whichever is lower, for 5 seconds   |



续上表

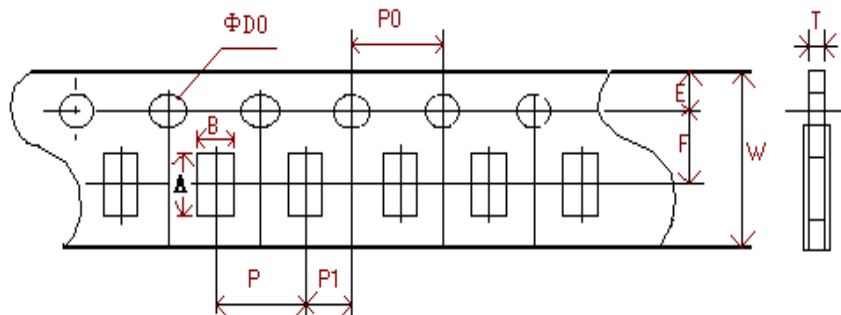
|   |   |  |
|---|---|--|
| 耐焊接热<br>Resistance to Soldering Heat        | 无可见损伤 No mechanical damage<br>$\Delta R \leq \pm (1.0\%R + 0.005 \Omega)$ | 260°C ± 5°C 10 ± 1 秒<br>260°C ± 5°C 10s ± 1s   |
| 稳态湿热<br>Steady state humidity               | 无可见损伤 No mechanical damage<br>$\Delta R \leq \pm (3.0\%R + 0.005 \Omega)$ | 40°C ± 2°C 90%~95%RH 1000 小时<br>40°C ± 2°C 90%~95%RH 1000h   |
| 70°C 耐久性<br>Load Life                       | 无可见损伤 No mechanical damage<br>$\Delta R \leq \pm (3.0\%R + 0.005 \Omega)$ | 70°C ± 2°C 1000 小时 额定电压<br>通 1.5 小时, 断 0.5 小时<br>70°C ± 2°C 1000h Rated voltage<br>1.5h on/0.5h off  |
| 上限类别温度耐久性<br>Endurance at upper temperature | 无可见损伤 No mechanical damage<br>$\Delta R \leq \pm (3.0\%R + 0.005 \Omega)$ | 125°C ± 2°C 1000 小时<br>125°C ± 2°C 1000h   |
| 耐溶剂性<br>Resistance to Solvent               | 无可见损伤 No mechanical damage<br>$\Delta R \leq \pm (1.0\%R + 0.005 \Omega)$ | 浸入三氯乙烯 10 ± 1 小时<br>Dip in chloroethylene for 10h ± 1h.  |
| 绝缘电阻<br>Insulation Resistance               | 1000MΩ Min  | 在电极与基片间施加 100V 直流电压, 保持 1 分钟, 然后测绝缘电阻值.<br>Apply DC 100V between substrate and termination for 1 minute, then check insulation resistance. |
| 可焊性<br>Solderability                        | 可焊面积 ≥ 95%<br>95% Cover Min   | 235°C ± 5°C 2 ± 0.5 秒<br>235°C ± 5°C 2s ± 0.5s   |
| 附着力<br>Adhesion                             | 外观无可见损伤<br>No mechanical damage   | 施加力 5N 10 ± 1 秒<br>Applying 5N 10s ± 1s  |

## ■ 包装 Packaging

### ● 编带包装 Tape and reel

\* 纸带编带 Paper taping

0603、0805、1206、1210:





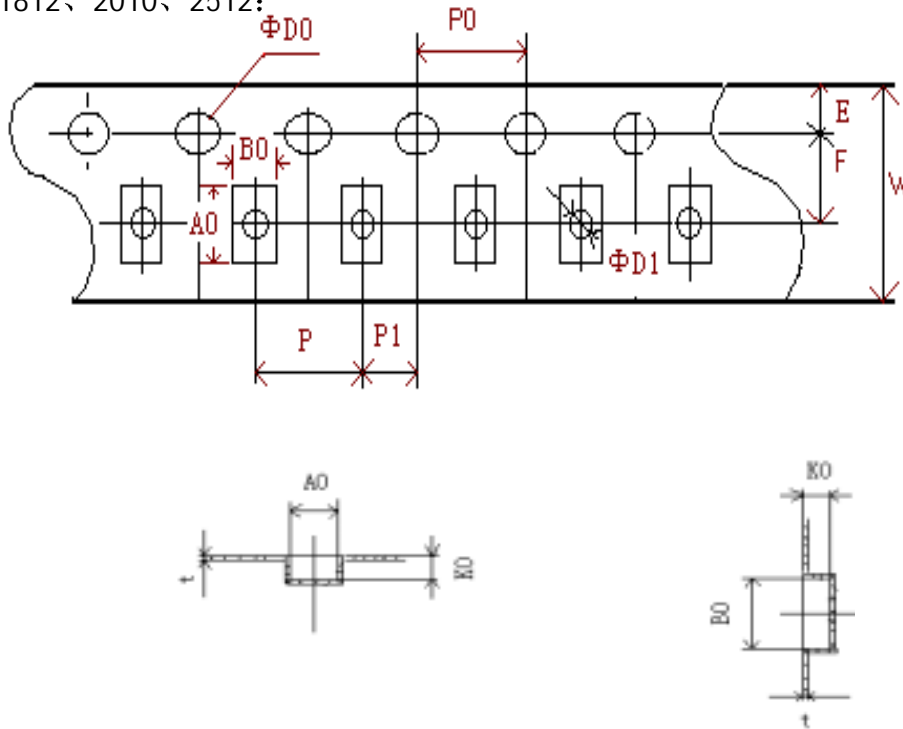
单位 unit: mm

| 型号 Type | A        | B        | W        | F        | E        |
|---------|----------|----------|----------|----------|----------|
| 0603    | 1.85±0.1 | 1.10±0.1 | 8.00±0.2 | 3.5±0.05 | 1.75±0.1 |
| 0805    | 2.35±0.1 | 1.65±0.1 | 8.0±0.20 | 3.5±0.05 | 1.75±0.1 |
| 1206    | 3.50±0.2 | 1.90±0.2 | 8.0±0.20 | 3.5±0.05 | 1.75±0.1 |
| 1210    | 3.50±0.2 | 2.80±0.2 | 8.0±0.20 | 3.5±0.05 | 1.75±0.1 |

| 型号 Type | P       | P0      | P1       | D0      | T        |
|---------|---------|---------|----------|---------|----------|
| 0603    | 4.0±0.1 | 4.0±0.1 | 2.0±0.05 | 1.5±0.1 | 0.60±0.1 |
| 0805    | 4.0±0.1 | 4.0±0.1 | 2.0±0.05 | 1.5±0.1 | 0.75±0.1 |
| 1206    | 4.0±0.1 | 4.0±0.1 | 2.0±0.05 | 1.5±0.1 | 0.75±0.1 |
| 1210    | 4.0±0.1 | 4.0±0.1 | 2.0±0.05 | 1.5±0.1 | 0.75±0.1 |

\* 塑料带编带 Embossed tapping

1218、1812、2010、2512:



单位 unit: mm

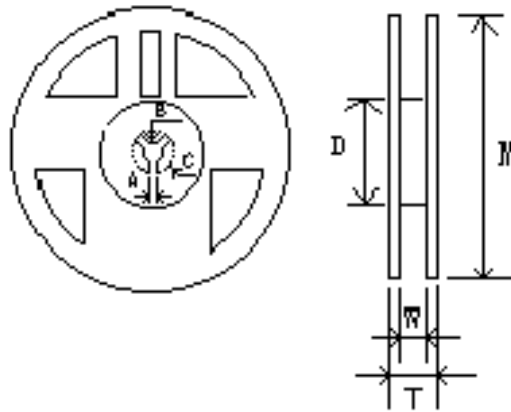
| 型号 Type      | A0        | B0        | W          | F         | E         | t         |
|--------------|-----------|-----------|------------|-----------|-----------|-----------|
| 1812<br>1218 | 4.80±0.10 | 3.40±0.10 | 12.00±0.10 | 5.50±0.10 | 1.75±0.10 | 0.25±0.05 |
| 2010         | 5.45±0.10 | 2.77±0.10 | 12.00±0.10 | 5.50±0.10 | 1.75±0.10 | 0.24±0.05 |
| 2512         | 6.73±0.10 | 3.40±0.10 | 12.00±0.10 | 5.50±0.10 | 1.75±0.10 | 0.24±0.05 |



单位 unit: mm

| 型号 Type      | P         | P0        | P1        | D0           | D1        | K0        |
|--------------|-----------|-----------|-----------|--------------|-----------|-----------|
| 1812<br>1218 | 4.00±0.10 | 4.00±0.10 | 2.00±0.05 | 1.55±0.10    | 1.50±0.10 | 1.00±0.10 |
| 2010         | 4.00±0.10 | 4.00±0.10 | 2.00±0.05 | 1.50+0.10/-0 | 1.50±0.10 | 0.84±0.10 |
| 2512         | 4.00±0.10 | 4.00±0.10 | 2.00±0.05 | 1.50+0.10/-0 | 1.50±0.10 | 0.81±0.10 |

\* 卷盘 Reel



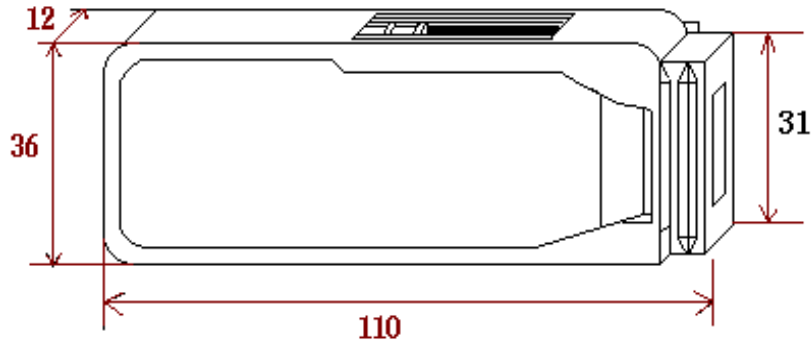
单位 unit: mm

| 型号 Type | M    | W    | T    | A    | B    | C    | D    |
|---------|------|------|------|------|------|------|------|
| 0603    |      |      |      |      |      |      |      |
| 0805    | 178  | 9.5  | 12.5 | 2.0  | 13.0 | 21.0 | 80.0 |
| 1206    | ±2.0 | ±1.0 | ±1.5 | ±0.5 | ±0.5 | ±0.5 | ±2.0 |
| 1210    |      |      |      |      |      |      |      |
| 1218    |      |      |      |      |      |      |      |
| 1812    | 178  | 13.0 | 15.5 | 2.0  | 13.0 | 21.0 | 57.0 |
| 2010    | ±2.0 | ±0.5 | ±1.5 | ±0.5 | ±0.5 | ±0.5 | ±2.0 |
| 2512    |      |      |      |      |      |      |      |



● 塑料盒包装 Bulk case

单位 unit: mm



● 包装数量 Packaging quantity

| 包装方法<br>Packaging style | 编带<br>Tape and reel          |                              | 塑料盒<br>Bulk case |       |      |              |                      | 塑料袋散装<br>Bulk        |                                      |
|-------------------------|------------------------------|------------------------------|------------------|-------|------|--------------|----------------------|----------------------|--------------------------------------|
| 型号<br>Type              | 0603<br>0805<br>1206<br>1210 | 1218<br>1812<br>2010<br>2512 | 0603             | 0805  | 1206 | 1210<br>2010 | 1218<br>1812<br>2512 | 0603<br>0805<br>1206 | 1210<br>1218<br>1812<br>2010<br>2512 |
| 数量 (PCS)<br>Quantity    | 5000                         | 4000                         | 25000            | 10000 | 5000 | 1500         | 1000                 | ≤10000               | ≤4000                                |