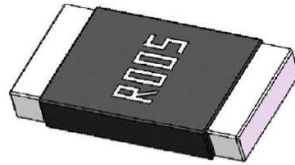


## ■ 微阻高功率合金电阻 (Low Resistance High Power Chip Resistor)



### ■ 应用 (Application)

- DC-DC Converter , Battery Pack, Charge, Adaptor
- Portable Instruments (PDA and Cell Phone)
- Voltage Regulation Module (VRM)
- Computer
- Power Management Applications
- Switching Power Supply
- DC-DC 转换器, 电池组, 充电, 适配器
- 便携式仪器(PDA 和手机)
- 电压调节模块(VRM)
- 电脑
- 电源管理应用
- 开关电源

### ■ 特点 (Features)

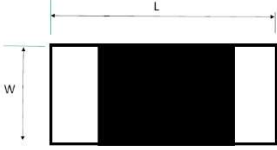

- Good performance for Heat Dissipation
- For High Power Dissipation
- Low Resistance and High Accuracy Resistor for Current Detection
- Pb-free to Meet RoHS Requirements
- 散热性能好
- 用于高功率耗散
- 用于电流检测的低电流, 高精度电阻
- 无铅, 符合 RoHS 要求

### ■ 料号说明 (Parts Number Explanation) :

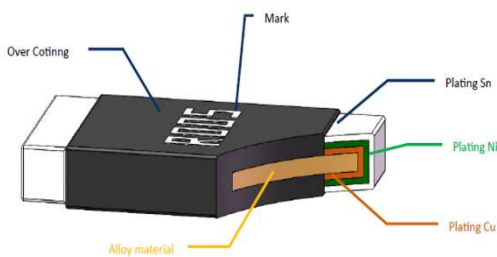
示例 Example: FPM252WFR330TM

<b>F</b> 公司名	<b>R</b> 产品别	<b>M</b> 功能别	<b>25</b> 型别	<b>2W</b> 功率	<b>F</b> 公差	<b>R330</b> 字码	<b>I</b> 包装别	<b>M</b> 材质	<b>L</b> 特殊型
FOJAN	R:Resistor	M:Metal	12:1206 10:1210 20:2010 25:2512	05: 1/2W 07: 3/4W 1W:1W 2W:2W 3W:3W	B:±0.1% C:±0.25% D:±0.5% F:±1% G:±2% J:±5%	R100=100mΩ R910=910mΩ R001=1mΩ	T: 7 inch reel Q:10 inch reel R:13 inch reel B:Bulk	M: MnCu N: NiCu C: Cu K: Karma	L: Special case S:Width Electrode
Company code	Type code	Functional code	Size code	Power code	Tolerance code	Resistance code	Packaging code	Termination code	Special code

■ 尺寸 (Dimension)

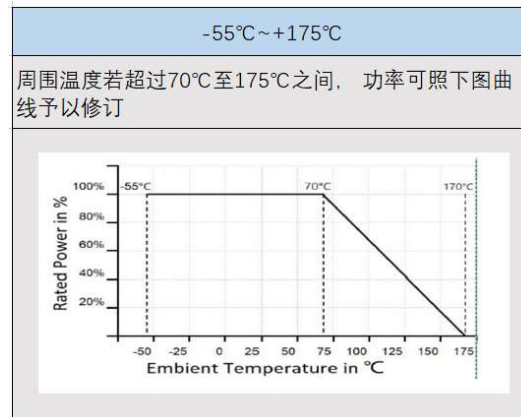
尺寸 dimension					单位 (unit) : mm
	型别 (Type)	L	W	C	
2512	6.40±0.20	3.20±0.20	0.95±0.20	0.90±0.20	
2512 (Width Electrode)	6.40±0.20	3.20±0.20	2.10±0.25	0.90±0.20	
1206	3.20±0.20	1.60±0.20	0.50±0.30	0.70±0.15	

■ 电阻结构 (Construction)



NO.	结构 construction	主要材料 Major material
1	合金材料 Alloy material	Karma NiCr
2	铜电极 Cu plating layer	铜 Cu
3	镍电极 Ni plating layer	镍 Ni
4	锡电极 Sn plating layer	锡 Matte Tin
5	保护层 Over Coating	环氧树脂 Epoxy
6	文字 Marking	环氧树脂 Epoxy

■ **功率衰减曲线 ( Derating Curve)**



■ **阻值范围 (Resistance range)**

型别 Type	阻值范围 Resistance Range	
	1%	2%&5%
2512	101mΩ~510mΩ	101mΩ~510mΩ
2512 (Width Electrode)	1mΩ~10mΩ	1mΩ~10mΩ
1206	101mΩ~200mΩ	101mΩ~200mΩ

如有非标准品的需求,请联系我们的业务部门 For non-standard parts, please contact our sales dept.

■ **电气特性 (Electrical characteristics)**

型别 Type	额定功率 (Power Rating at 70°C)	绝缘耐压 Dielectric Withstanding Voltage	T.C.R. (PPM/°C)	阻值范围 Resistance Range
2512	2W	500V	±50PPM/°C	101mΩ~510mΩ
2512 (Width Electrode)	2W	500V	±50PPM/°C	1mΩ~10mΩ
1206	1/2W	500V	±50PPM/°C	101mΩ~200mΩ

## ■ 性能 (Performance Specifications)

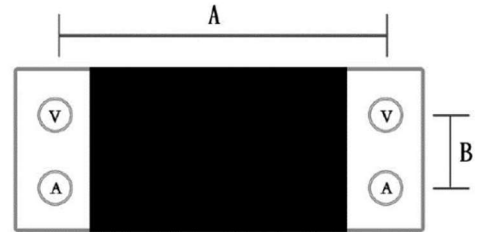
内容 Item	测试方法 Test Methods	测试条件 Test Conditions	规格 Specification
温度系数 Temperature Coefficient	JIS C 5201 4.8	$TCR = (R - R_0) / (t - t_0) R_0 \times 10^6$ (ppm) R <sub>0</sub> 电阻在室温下的阻值(resistance at room temperature) R 电阻在 125℃或-55℃下的阻值 (resistance at 125℃ or -55℃) t <sub>0</sub> 室温(room temperature) t 测试温度 (test temperature 125℃ or -55℃)	±50PPM/°C
短时间过负荷 Short-time overload	JIS C 5201 4.13	加载 2.5 倍的额定电压, 时间 5 秒后测量试验前后的阻值变化率。 Applied 2.5 times of rated voltage for 5 second. Measure the variation of resistance.	±(0.5% +0.05Ω)
焊锡性 Solderability	JIS C 5201 4.17	沾助焊剂后浸入锡炉, 锡炉温度 245±5℃, 时间 3±0.5 秒。 Dip the terminal in a flux and then dip into a soldering bath at 245±5℃ for 3±0.5sec.	> 95%面积上锡 ( > 95% coverage)
抗焊锡热 Resist to soldering heat	JIS C 5201 4.18	沾助焊剂后浸入锡炉, 锡炉温度 260±5℃, 时间 10±0.5 秒, 测量试验前后的阻值变化率。 Dip the terminal in a flux and then dip into a soldering bath at 260±5℃ for 10±0.5sec. Measure the variation of resistance.	±(0.5% +0.05Ω)

内容 Item	测试方法 Test Methods	测试条件 Test Conditions	规格 Specification
绝缘电阻 Insulation resistance	JIS C 5201 4.6	电阻本体上加载绝缘耐压 60±5 秒后，测量绝缘阻抗。 Applied the dielectric withstanding voltage on the center of body for 60±5seconds. Then measure insulation resistance.	>100MΩ
绝缘耐压 Dielectric withstanding voltage	JIS C 5201 4.7	电阻本体上加载绝缘耐压 60±5 秒。 Applied the dielectric withstanding voltage on the center of body for 60±5seconds.	无击穿、飞弧及可见机械性损伤 No evidence of flashover, mechanical damage arcing or insulation breakdown
温度循环 Temperature Cycling	JIS C 5201 4.19	电阻放入温度循环机中，温度 155±2℃ 至 -55±3℃，共 5 个循环。量测试验前后阻值变化率。 Put specimen in a chamber which temperature can be changed to 155±2℃ or -55±3℃, repeated 5 times. Measure the variation of resistance.	±(0.5% +0.05Ω)
端子弯曲 Terminal bending	JIS C 5201 4.33	电阻焊接在测试板上进行弯折,弯折保持时间 20±1 秒, 1206(含) 以下的尺寸弯曲 5+0.2/0 mm; 1206 以上的尺寸弯曲 2+0.2/0 mm; 量测试验前后阻值变化率 Specimen shall be mounted on test board, then bend the board and maintained for 20±1s. the distance of bending is 5+0.2/0 mm for resistors which size no larger than 1206 or 2+0.2/0 mm which size larger than 1206. Measure the variation of resistance.	±(1.00% +0.05Ω)

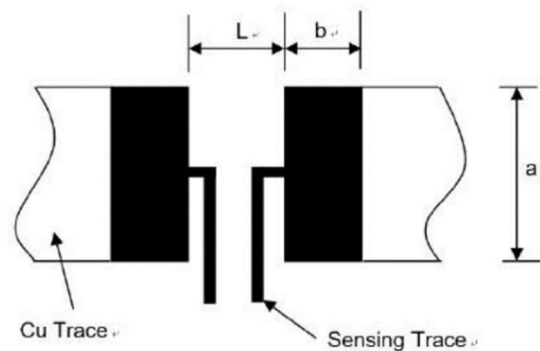
内容 Item	测试方法 Test Methods	测试条件 Test Conditions	规格 Specification
温度循环 Temperature Cycling	JIS C 5201 4.19	<p>电阻放入温度循环机中, 温度 <math>155\pm 2^\circ\text{C}</math> 至 <math>-55\pm 3^\circ\text{C}</math>, 共 5 个循环。量测试验前后阻值变化率。</p> <p>Put specimen in a chamber which temperature can be changed to <math>155\pm 2^\circ\text{C}</math> or <math>-55\pm 3^\circ\text{C}</math>, repeated 5 times. Measure the variation of resistance.</p>	$\pm(1.00\% + 0.05\Omega)$
负荷寿命 Load life	JIS C 5201 4.25.1	<p>电阻放入恒温箱中, 温度 <math>70\pm 2^\circ\text{C}</math>, ON TIME:1.5H, OFF TIME:0.5H, 通电额定电压 <math>1000^{+24}/_{-0}</math> 小时, 量测试验前后阻值变化率。</p> <p>Put the specimen in a chamber at <math>70\pm 2^\circ\text{C}</math> temperature, ON TIME:1.5H, OFF TIME:0.5H, and applied rated voltage for <math>1000^{+24}/_{-0}</math>H. Measure the variation of resistance.</p>	$\pm(1.00\% + 0.05\Omega)$
耐湿特性 Humidity	JIS C 5201 4.24	<p>电阻放入恒温恒湿箱, 温度 <math>40\pm 2^\circ\text{C}</math>, 湿度 90~95 %RH;通电额定电压 1.5 小时, 断电 0.5 小时; 重复通断电至试验时间 <math>1000^{+48}/_{-0}</math> 小时。量测试验前后阻值变化率。</p> <p>Put the specimen in a chamber at <math>40\pm 2^\circ\text{C}</math> temperature and 90~95% relative humidity, then applied rated voltage for 1.5H and rested for 0.5H repeatedly till total test time is <math>1000^{+48}/_{-0}</math> H. Measure the variation of resistance.</p>	$\pm(1.00\% + 0.05\Omega)$

### 阻值量测点 (Resistance measurement point)

型别 (Type)	A	B
2512	5.60±0.25 (mm)	2.00±0.25 (mm)
1206	2.60±0.25 (mm)	0.90±0.25 (mm)



### 建议的焊盘尺寸 (Recommended pad dimensions)

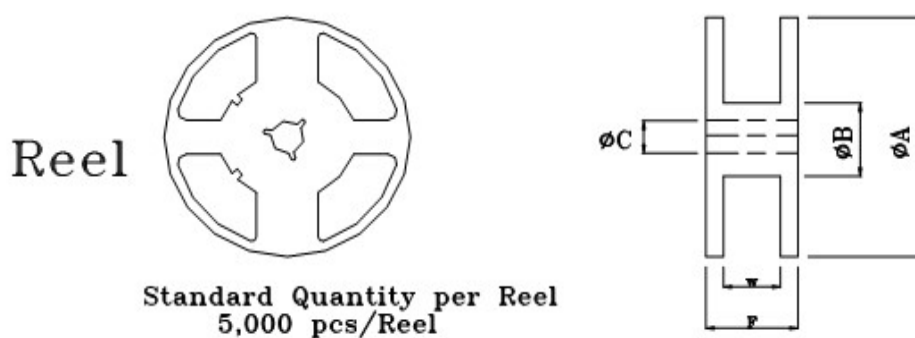


型别 (Type)	a	b	L
2512 ( $\geq 0.002\Omega$ )	4.0±0.10 (mm)	2.1±0.10 (mm)	4.1±0.10mm
2512 ( $\leq 0.004\Omega$ ) (Width Electrode)	4.0±0.10 (mm)	2.1±0.10 (mm)	1.3±0.10mm
1206 ( $\geq 0.001\Omega$ )	1.8±0.10 (mm)	2.3±0.10 (mm)	1.0±0.10mm

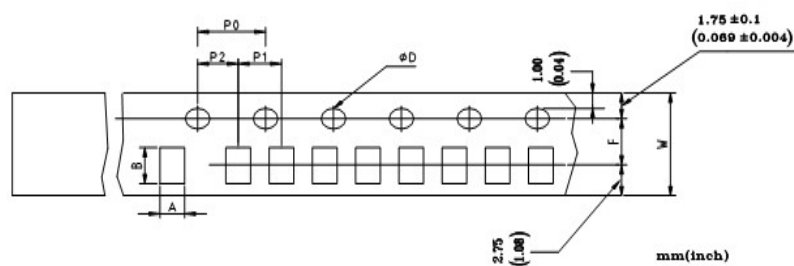
## ■ 包装规格 (Tapping Specification)

### -卷盘尺寸 (Reel dimension)

Type	Size		Unit	A	B	C	F	W
2512	7"	4K/Reel	mm	178±2.0	80.0±1.0	13.5±0.5	15.4±1.0	13.8±0.5
1206	7"	5K/Reel	mm	178±2.0	60.0±1.0	13.5±0.5	15.4±1.0	9.00±0.5



### -包装尺寸 (packing dimension)



Unit: mm

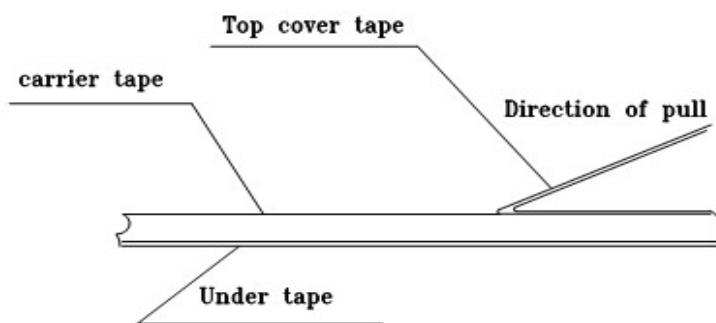
Dimensions	A	B	D	F	P0	P1	P2	W
2512	3.40±0.10	6.90±0.20	1.50± $\frac{0.1}{0.0}$	5.50±0.05	4.00±0.10	4.00±0.10	2.00±0.05	12.0±0.20
1206	2.00±0.20	3.60±0.20	1.50± $\frac{0.1}{0.0}$	3.50±0.05	4.00±0.10	4.00±0.10	2.00±0.05	8.0±0.20



## ■ 上胶带剥离力测试 (Peel force of top cover tape)

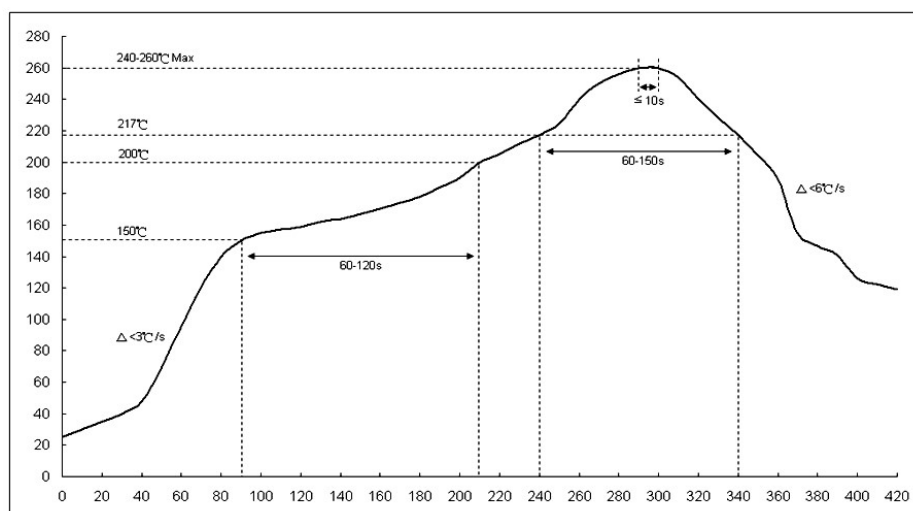
上胶带以 200mm/分钟的速度，沿 165~180 度角的方向进行剥离，如下图所示。纸带的剥离力范围为 10g~70g；载带的剥离力范围为 30~100g。

The top cover tape is pulled at a speed of 200 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)

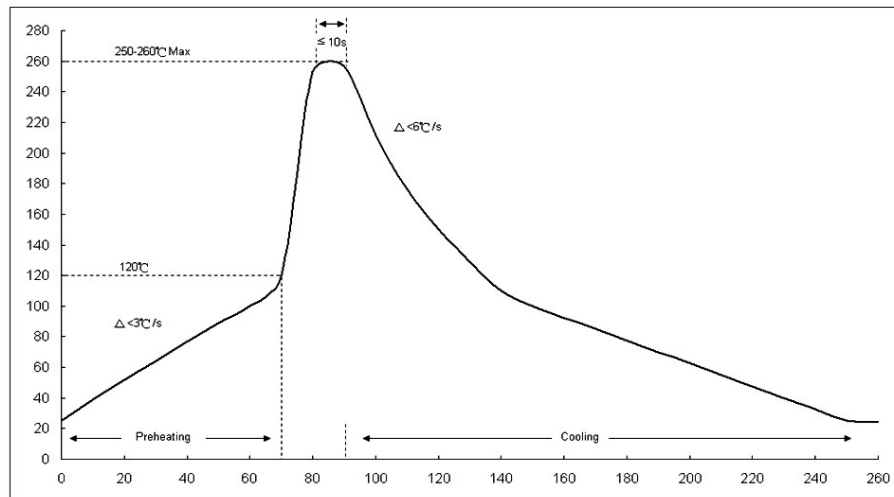


## ■ 焊接 (soldering)

### - 建议回流焊曲线 (Recommend reflow soldering profile)



### -建议波峰焊曲线 ( Recommend wave soldering profile )



### -手工焊温度 ( hand soldering temperature )

烙鐵溫度  $350\pm 10^{\circ}\text{C}$  3 秒之內，避免烙鐵接觸電阻本體

The iron temperature is  $350\pm 10^{\circ}\text{C}$ , hand soldering time less than 3S. Avoid solder iron tip direct touch the components body

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