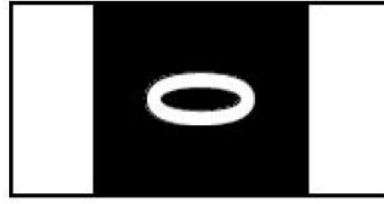
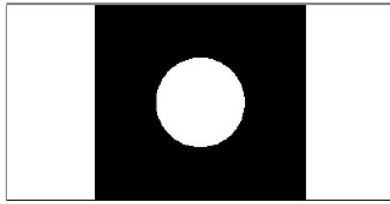


## ■ 微阻高功率合金电阻 (Zero milli-ohm (Jumper) Metal alloy Chip Resistor)



### ■ 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)

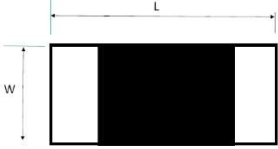

- Good performance for Heat Dissipation
- For High Power Dissipation
- Low Resistance and High Accuracy Resistor for Current Detection
- Pb-free to Meet RoHS Requirements
- 散热性能好
- 用于高功率耗散
- 用于电流检测的低电流, 高精度电阻
- 无铅, 符合 RoHS 要求

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

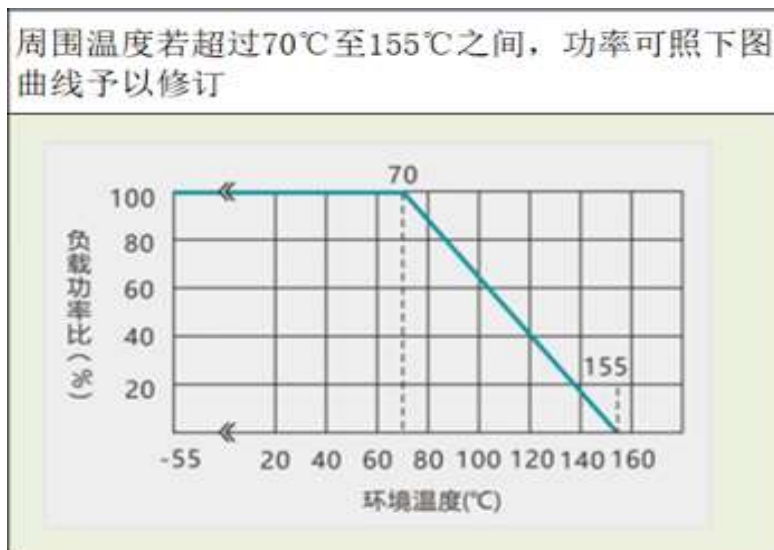
示例 Example: FRM0805FR000TM

<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>R000</b> 字码	<b>I</b> 包装别	<b>M</b> 材质	特殊型
FOJAN	R:Resistor P:High Power	M:Metal F:FOIL	06:0603 08:0805 12:1206 25:2512	04:1/4W 05: 1/2W 1W:1W 2W:2W 3W:3W	J:±5%	R000=Below 0.2mΩ	T: 7 inch reel Q:10 inch reel R:13 inch reel B:Bulk	M: MnCu N: NiCu C: Cu	Blank: None
Company code	Type code	Functional code	Size code	Power code	Tolerance code	Resistance code	Packaging code	Material code	Special code

## 尺寸 (Dimension)

尺寸 dimension					单位 (unit) :
	mm				
型别 (Type)	L	W	C	T	
0603-1/4W	1.60±0.10	0.80±0.10	0.30±0.15	0.35±0.15	
0805-1/2W	2.03±0.20	1.27±0.20	0.40±0.15	0.35±0.15	
1206-1/2W 1206-1W	3.20±0.20	1.60±0.20	0.70±0.30	0.50±0.20	
2512-2W	6.35±0.20	3.05±0.20	1.40±0.20	0.60±0.20	
2512-3W	6.35±0.20	3.05±0.20	1.40±0.25	0.60±0.20	

## 功率衰减曲线 ( Derating Curve)



■ 电气特性 (Electrical characteristics)

型别 Type	额定功率 (Power Rating at 70°C)	最大过负荷电流 Max Loading Current	Resistance (mΩ)
0603	1/4W	28.9A	<0.30
0805	1/2W	50.0A	<0.20
1206	1/2W	50.0A	<0.20
1206	1W	70.7A	<0.20
2512	2W	100.0A	<0.20
2512	3W	122.5A	<0.20

■ 性能 (Performance Specifications)

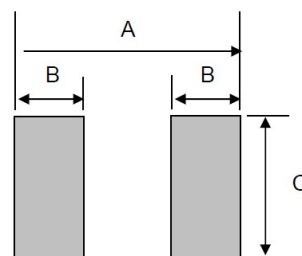
内容 Item	测试方法 Test Methods	测试条件 Test Conditions	规格 Specification																
短时间过负荷 Short-time overload	JIS C 5201 4.13	<p>加载如下图的功率，时间 5 秒后测量试验前后的阻值变化率。</p> <p>Applied Overload condition refer to below, for 5 second. Measure the variation of resistance.</p> <table border="1"> <thead> <tr> <th>Type</th> <th>Power (W)</th> <th># of rated power</th> </tr> </thead> <tbody> <tr> <td>0603</td> <td>1/4</td> <td rowspan="6">4 times</td> </tr> <tr> <td>0805</td> <td>1/2</td> </tr> <tr> <td>1206</td> <td>1/2</td> </tr> <tr> <td></td> <td>1.0</td> </tr> <tr> <td>2512</td> <td>2.0</td> </tr> <tr> <td>2512</td> <td>3.0</td> </tr> </tbody> </table>	Type	Power (W)	# of rated power	0603	1/4	4 times	0805	1/2	1206	1/2		1.0	2512	2.0	2512	3.0	<p>0603: ≤0.3mΩ                      Others: ≤0.2mΩ</p> <p>No evidence of mechanical damage</p>
Type	Power (W)	# of rated power																	
0603	1/4	4 times																	
0805	1/2																		
1206	1/2																		
	1.0																		
2512	2.0																		
2512	3.0																		

内容 Item	测试方法 Test Methods	测试条件 Test Conditions	规格 Specification
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.	0603: ≤0.3mΩ Others: ≤0.2mΩ  No evidence of mechanical damage
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.	≥10 <sup>9</sup> Ω
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
温度快速变化 Rapid temperature changes	JIS C 5201 4.19	电阻放入温度循环机中，T1 温度: -55±3℃; T2 温度: 155±3℃./125±3℃, 放置 30 分钟，共 1000 个循环。量测试验前后阻值变化率。 Put specimen in a chamber which temperature can be T1: -55±3℃; T2: 155±3℃/125±3℃, 30min, repeated 1000 cycles. Measure the variation of resistance.	0603: ≤0.3mΩ Others: ≤0.2mΩ  No evidence of mechanical damage

内容 Item	测试方法 Test Methods	测试条件 Test Conditions	规格 Specification
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.	0603: ≤0.3mΩ Others: ≤0.2mΩ  No evidence of mechanical damage
负荷寿命 Load life	JIS C 5201 4.25.1	电阻放入恒温箱中, 温度 70±2℃, ON TIME:1.5H, OFF TIME:0.5H, 通电额定电压 1000 <sup>+24</sup> / <sub>-0</sub> 小时, 量测试验前后阻值变化率。 Put the specimen in a chamber at 70±2℃ temperature, ON TIME:1.5H, OFF TIME:0.5H, and applied rated voltage for 1000 <sup>+24</sup> / <sub>-0</sub> H. Measure the variation of resistance.	0603: ≤0.3mΩ Others: ≤0.2mΩ  No evidence of mechanical damage
耐湿特性 Humidity	JIS C 5201 4.24	电阻放入恒温恒湿箱, 温度 40±2℃, 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 1000 <sup>+48</sup> / <sub>-0</sub> 小时. 量测试验前后阻值变化率。 Put the specimen in a chamber at 40±2℃ temperature and 90~95% relative humidity, then applied rated voltage for 1.5H and rested for 0.5H repeatedly till total test time is 1000 <sup>+48</sup> / <sub>-0</sub> H. Measure the variation of resistance.	0603: ≤0.3mΩ Others: ≤0.2mΩ  No evidence of mechanical damage

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

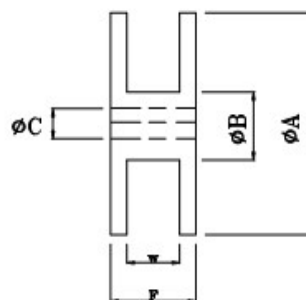
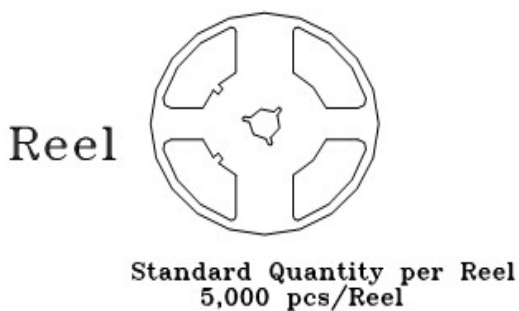
型别 (Type)	A (mm)	B (mm)	C (mm)
0603	2.60	0.90	0.90
0805	3.40	1.30	1.30
1206	4.00	1.50	1.80
2512	7.60	2.60	3.80



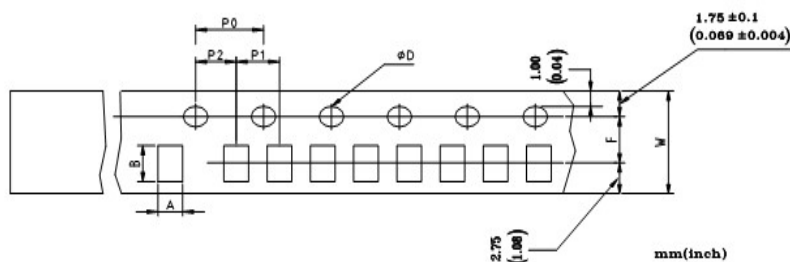
### ■ 包装规格 (Tapping Specification)

#### -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
0603 0805 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)



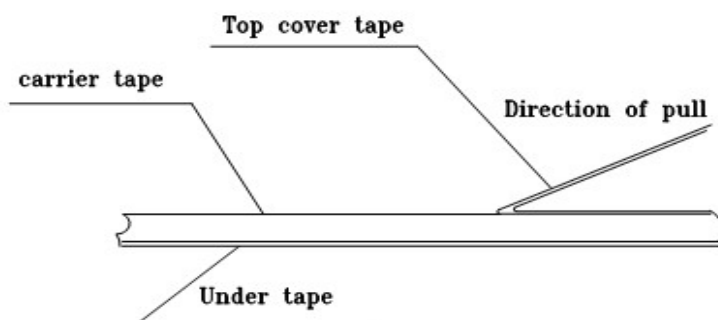
Unit: mm

Dimensions	A	B	D	F	P0	P1	P2	W
0603	1.05±0.05	1.75±0.05	1.50± $\begin{smallmatrix} 0.1 \\ 0.0 \end{smallmatrix}$	3.50±0.05	4.00±0.10	4.00±0.10	2.00±0.05	8.0±0.20
0805	1.55±0.10	2.30±0.10	1.50± $\begin{smallmatrix} 0.1 \\ 0.0 \end{smallmatrix}$	3.50±0.05	4.00±0.10	4.00±0.10	2.00±0.05	8.0±0.20
1206	1.90±0.20	3.50±0.20	1.50± $\begin{smallmatrix} 0.1 \\ 0.0 \end{smallmatrix}$	3.50±0.05	4.00±0.10	4.00±0.10	2.00±0.05	8.0±0.20
2512	3.40±0.10	6.70±0.20	1.50± $\begin{smallmatrix} 0.1 \\ 0.0 \end{smallmatrix}$	5.50±0.05	4.00±0.10	4.00±0.10	2.00±0.05	12.0±0.20

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

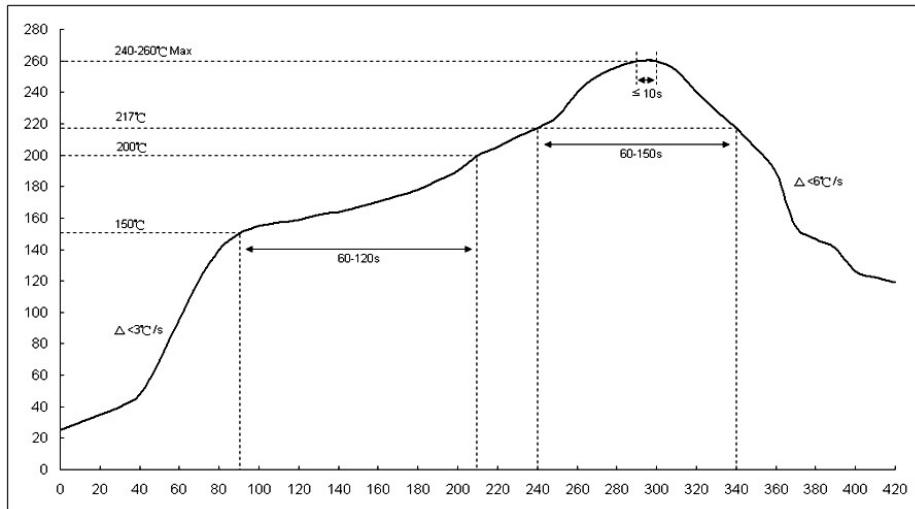
上胶带以 200mm/分钟的速度，沿 165~180 度角的方向进行剥离，如下图所示。纸带的剥离力范围为 10g~70g；载带的剥离力范围为 30~100g。

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)

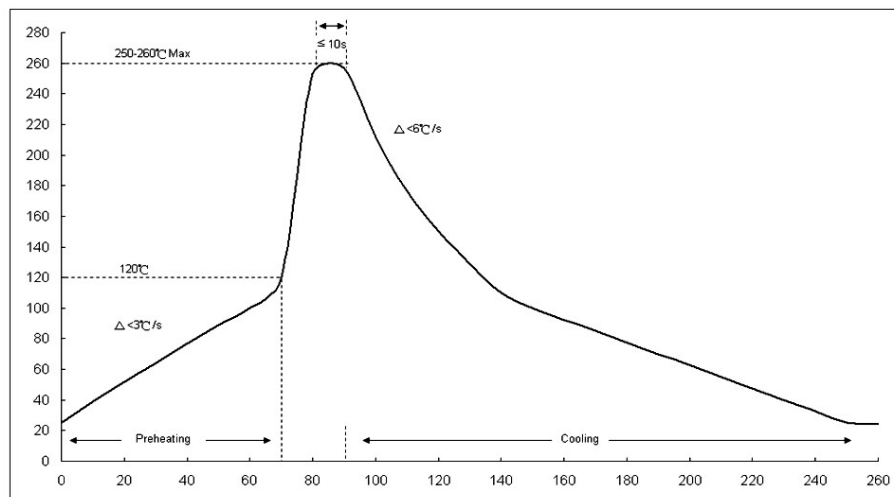


## ■ 焊接 (soldering)

### - 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±10°C 3 秒之內 · 避免烙鐵接觸電阻本體

The iron temperature is 350±10°C, hand soldering time less than 3S. Avoid solder iron tip direct touch the components body



## ■ 厚膜电阻器使用说明 (Chip Resistor Instructions for use)

- 本产品在以下特殊环境下应用，性能可能会收到影响 (Application of the products in a special environment can deteriorate product performance) :

1. 高温;  
High temperature
2. 有海风或腐蚀性气体，包括氯气，硫化氢，氨气，二氧化硫，二氧化氮等;  
Near the sea ,or corrosive gas, such as Cl<sub>2</sub>,H<sub>2</sub>S,NH<sub>3</sub>,SO<sub>2</sub>,and NO<sub>2</sub>,etc;
3. 各种类型的液体，包括水，油，化学品，有机溶剂的使用;  
Unverified liquids, such as water,oil,chenical or organic solvent;
4. 在用树脂或其他涂层材料密封产品的情况下使用;  
Unverified resin or paint to cover products;
5. 焊接后使用不洁焊剂或使用水或水溶性清洁剂清洗产品  
Products should be washed with soluble cheaner even if non cleaning flux.

## - 储存 / 搬运条件 (STORAGE / CARRY CONDITIONS)

6. 储存温度 25±5℃                      Temperature: 25±5℃
7. 湿度 30~70%RH                      Humidity: 30~70%RH
8. 储存期限: 先进先出, 2年              Storage life: 2years FIFO
9. 存放和搬运时，请保持盒子的正确方向。严禁跌落在箱体上，否则可能损坏产品电极或本体      Please hold box correct orientation when storing and carrying.It is strictly prohibited to fall on the box.otherwise the product electrode or body may be damaged.