

車用合金贴片电阻规格书-AM 系列
Approval Specification Metal Current Sensing Chip Resistors
For Automotive-Type AM

规格书
SPECIFICATION

丽智电子（南通）有限公司

地址：江苏省南通市通州区康富路 789 号

Address: No. 789, Kang Fu Road Tongzhou District Nantong city Jiangsu province

Tel: 0086-0513-68856666

Fax: 0086-0513-68383688

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1 范围 (scope) :

1.1 适用于本公司所生产的无铅、无卤之車用合金贴片电阻 AM 系列

This specification applies to metal current sensing chip resistors for automotive which meet requirements of Pb free and halogen free.

1.2 符合 AEC-Q200 条款

The relevant provisions of the AEC-Q200

2 产品料号 (part number) :

2512 1% 2W 10mΩ

AM2512FBR010GM

<u>AM</u>	<u>2512</u>	<u>F</u>	<u>B</u>	<u>R010</u>	<u>G</u>	<u>M</u>
↓	↓	↓	↓	↓	↓	↓
类型(Type)	尺寸(Size)	公差	额定功率	阻值	包装代码	电极
AM: 車用合金贴片电阻	1206	Tolerance	Rated Power	Resistance value	Packing Code	terminal
(Metal current sensing chip resistors for Automotive)	2512	F=±1%	1= 1W	R002=2mΩ	G= reel (卷装)	M=窄电极
		G=±2%	B= 2W	R010=10 mΩ	V= bulk (散料)	Narrow terminal
		J=±5%	C= 3W	3L50=3.5mΩ	S= Double	T=宽电极
					Standard	Wide terminal
					Quantity (两倍卷盘标准包装量)	

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3 电阻本体字码标示(Marking on the Resistor's Body):

※ $\pm 1\%$, $\pm 2\%$, $\pm 5\%$ 的产品，以四字码标示，第一位字码 R 标示 10^{-3} ，后三位表示阻值的有效数字，

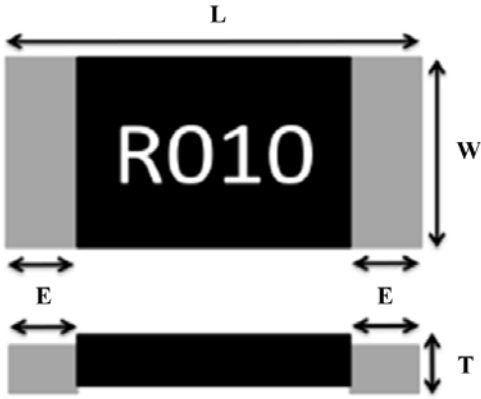
※ 第二位字码 R 表示阻值小数点。

※ 1206 1m Ω 产品以二字码标示，显示 01 两位有效数字

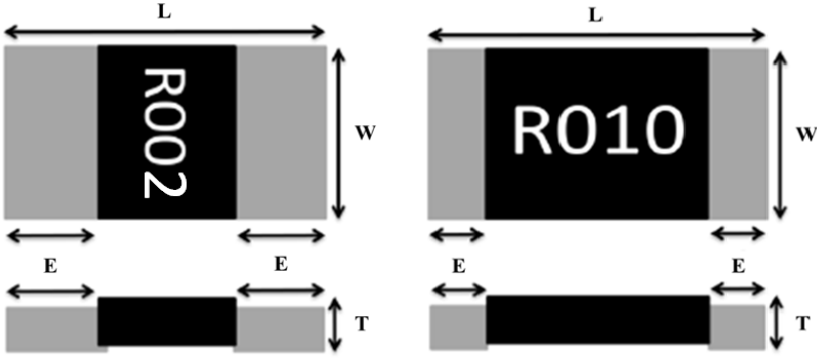
$\pm 1\%$, $\pm 2\%$, $\pm 5\%$ tolerance product: the marking is 4 digits, The first letter 'R' denotes 10^{-3} , The other three digitals declare resistance. The second letter 'R' mean point (1206 1m Ohm products are marked with 2 digits, and 01 is a valid digit)

R010=10m Ω	3R5m=3.5m Ω	1206=1 m Ω
		

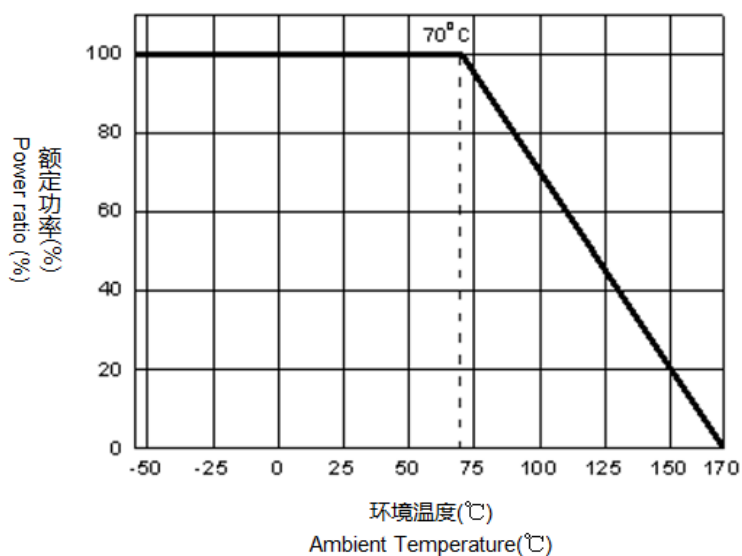
4 尺寸 (dimension) :

尺寸 dimension				
	单位 (unit) : mm			
型别 Type	L	W	T	E
AM1206*T	3.2 $\pm$ 0.20	1.6 $\pm$ 0.20	0.9 $\pm$ 0.15	0.9 $\pm$ 0.15
AM1206*M	3.2 $\pm$ 0.20	1.6 $\pm$ 0.20	0.7 $\pm$ 0.15	0.50 $\pm$ 0.30

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尺寸 dimension	 单位 (unit) : mm			
型别 Type	L	W	T	E
AM2512*T	6.4±0.2	3.2±0.2	0.9±0.2	2.10±0.25
AM2512*M				0.95±0.25

5 功率衰减曲线 (Derating Curve) :



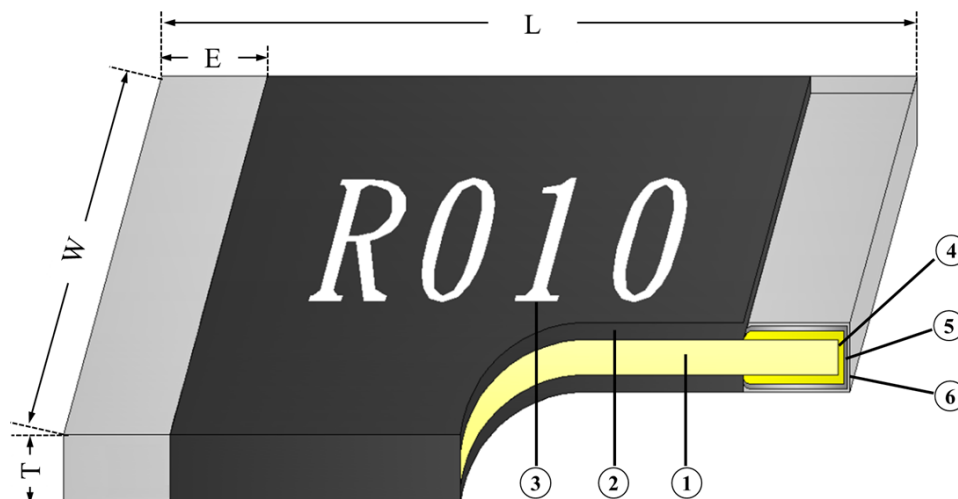
工作温度范围 (Operating Temperature Range) : -55℃~+170℃;

储存条件 (storage condition) : 5~30℃, 30~75%RH.

保存期限(Shelf Life): 2 年

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6 电阻结构（Construction）：



No.	结构 construction	主要材料 Major material
1	阻体 Resistive layer(Metal Alloy)	合金 Metal Alloy
2	保护层 Protective layer	环氧树脂 Epoxy
3	文字 Marking	环氧树脂 Epoxy
4	铜电极 Cu plating layer	铜 Cu
5	镍电极 Ni plating layer	镍 Ni
6	锡电极 Sn plating layer	锡 Sn

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7 阻值范围及电气特性（Resistance Range and Electrical Characteristics）：

型别 Type	额定功率 Rated Power	阻值范围 Resistance Range	最高额定 电流(A) Max Rating Current (A)	最高过载 电流(A) Max Overload Current(A)	温度特性 TCR (ppm/°C)
		F(±1%)、G(±2%)、J(±5%)			
AM1206*T	1W	1mΩ	31.62	70.71	±50
AM1206*M		2mΩ~100mΩ	22.36	50	±50
AM2512*T	2W	1mΩ~4mΩ	44.72	100	±50
AM2512*M		3mΩ~300mΩ	25.82	57.74	±50
AM2512*T	3W	1mΩ~4mΩ	54.77	122.47	±50
AM2512*M		3mΩ~100mΩ	31.62	70.71	±50

备注（remark）：

※ 额定电流计算公式（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：电阻阻值（Resistance）(Ω)

※ 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.

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8 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	IEC60115-1 4.13	加载 5 倍的额定功率，时间 5 秒后测量试验前后的阻值变化率。 Applied 5.0 times of rated power for 5 second. Measure the variation of resistance. $\Delta R\% = (R_2 - R_1) / R_1 \times 100 \text{-----} (\%)$ R1 = 试验前阻值(resistance before test) R2 = 试验后阻值(resistance after test)	$\leq \pm 0.5\%$
温度系数 Temperature Coefficient	IEC60115-1 4.8	$TCR = (R - R_0) / (t - t_0) R_0 \times 10^6 \text{ (ppm)}$ R ₀ 电阻在室温下的阻值(resistance at room temperature) R 电阻在+125℃或+25℃下的阻值(resistance at +125℃ or +25℃) t ₀ 室温(room temperature) t 测试温度(test temperature +125℃ or +25℃)	参照规格表 As Spec.
耐湿特性 Biased Humidity	MIL-STD-202 METHOD 103	加载 10%额定功率，85℃/85%RH，持续通电 1000H,试验结束 24±4 小时后进行测试 Specified conditions: 10% of operating power.85℃/85%RH. 1000 hours. Measurement at 24±4 hours after test conclusion.	$\leq \pm 0.5\%$

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温度循环 Temperature cycling	JESD22 Method JA-104	-55℃&+125℃, 循环 1000 次, 试验结束 24±4 小时后量测试验前后阻值变化率. 1000Cycles (-55℃ to +125℃) Measurement at 24±4 hours after test conclusion. Measure the variation of resistance at 24±4 hours after test conclusion.	$\cong \pm 0.5\%$
Operational Life 操作寿命	MIL-STD-202 Method 108	125±3℃ 恒温箱中施加额定电流 1000 小时, 取出后静置 24±4 小时量测阻值变化率。 1000 hours TA=125±3℃ at rated power. Measurement at 24±4 hours after test conclusion.	$\cong \pm 0.5\%$
Low Temperature Exposure (Storage) 低温放置	JIS-C-5201 4.23.4	-55±2℃ 恒温箱中 1000 小时, 取出后静置 1 小时以上后量测阻值变化率。 1000 hours TA=-55±2℃ . Measure at least 1 hour after the end of the experiment	$\cong \pm 0.5\%$
高温储存 High Temperature Exposure (Storage)	MIL-STD-202 Method 108	125℃下放置 1000H, 试验结束 24±4 小时后量测试验前后阻值变化率。 1000 hrs. @T=125℃. Measure the variation of resistance at 24±4 hours after test conclusion.	$\cong \pm 1.0\%$

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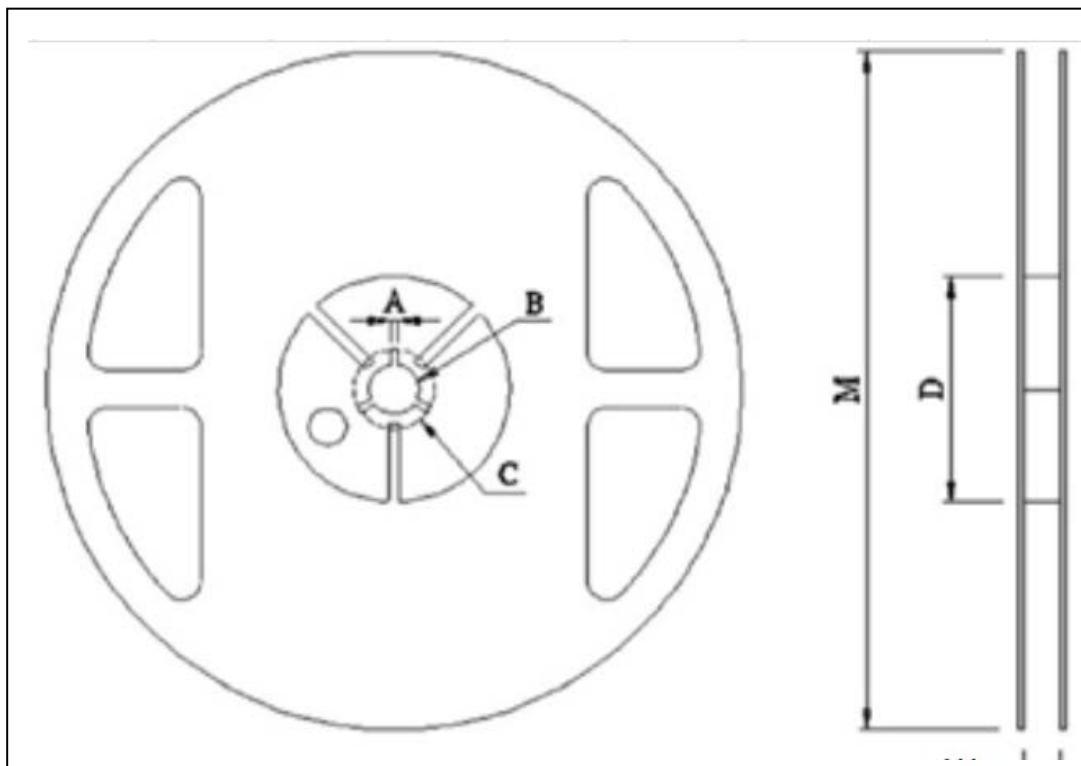
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Load Life 负荷寿命	JIS-C-5201-1 4.25	70±2℃烤箱中施加额定电流，90 分钟 ON，30 分钟 OFF，1,000 小时取出静置 1 小时以上后量测阻值变化率。 70±2℃, RCWV or Max. working voltage whichever is less for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"	≅±1.0%
抗焊锡热 Resistance to soldering heat	MIL-STD-202 Method 210	沾助焊剂后浸入锡炉，锡炉温度 260±5℃，时间 10±1 秒，取出静置 1 小时以上后，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 °C for 10±1sec. Measure the variation of resistance.	≅±0.5% 外观无损伤 No damage to appearance
焊锡性 Solderability	J-STD-002B test B	沾助焊剂后浸入锡炉，锡炉温度 245±5℃，时间 3 ±1 秒 Dip the terminal in a flux and then dip into a soldering bath at 245±5℃ for 3 ±1sec.	最少 95%面积上锡(Min 95% coverage)
端子弯曲 Board Flex	AEC-Q200-005	弯曲 2mm，60 秒，量测试验前后阻值变化率。 Min 2mm deflection ,60sec. Measure the variation of resistance. Measure the variation of resistance.	≅±0.5% 外观无损伤 No damage to appearance

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9 包装规格 (Tapping Specification)

9.1 卷盘尺寸 (reel dimension)



尺寸 Dimensions		A	B	C	D	M	W
AM1206	mm	2.00±0.5	13.5±0.5	21.00±0.5	60.00±1.0	178.00±2.0	9.00±0.5
	Inch	0.079±0.020	0.531±0.020	0.827±0.020	2.362±0.039	7.008±0.079	0.354±0.020
AM2512	mm	2.00±0.5	13.5±0.5	21.00±0.5	80.00±1.0	178.00±2.0	13.80±0.5
	Inch	0.079±0.020	0.531±0.020	0.827±0.020	3.150±0.039	7.008±0.079	0.543±0.020

※ 备注 (Remark) : (1) 2512 每卷 4,000 pcs

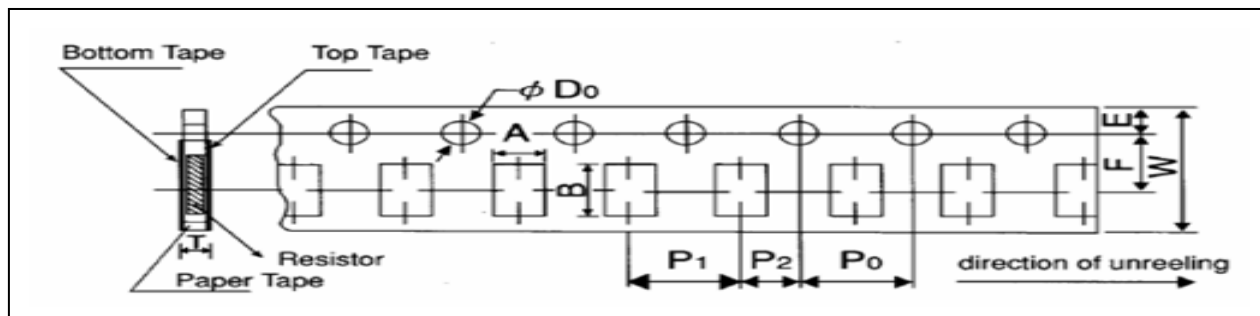
2512 Quantity per Reel 4,000 pcs/Reel

(2) 1206 每卷 5,000pcs

1206 Quantity per Reel 5,000 pcs/Reel

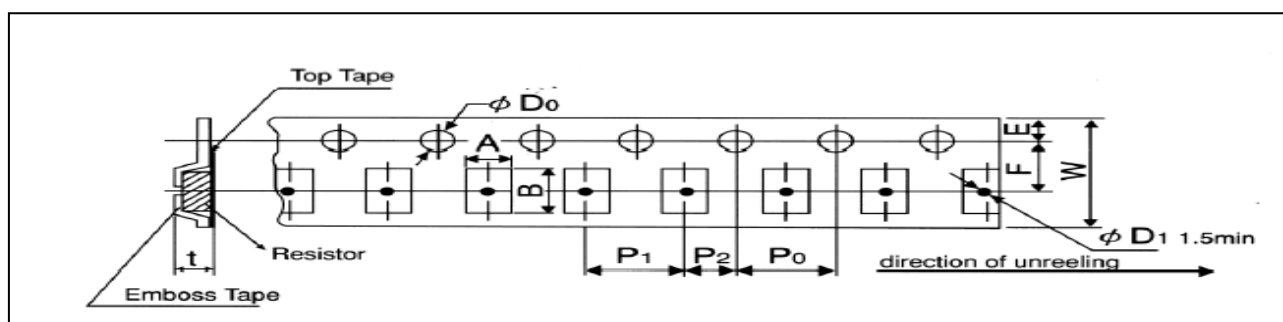
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9.2 包装尺寸 (packing dimension)



Unit: mm

Packing	Type	A	B	D ₀	E	F	P ₀	P ₁	P ₂	W	T	D1
Paper	1206	2.0±0.2	3.6±0.2	1.50 +0.1/-0	1.75 ±0.1	3.5 ±0.05	4.0±0.1	4.0±0.1	2.0±0.1	8.0±0.2	0.81±0.15	N/A



Unit: mm

Packing	Type	A	B	D ₀	E	F	P ₀	P ₁	P ₂	W	T	D1
Emboss	2512	3.6±0.2	6.9±0.2	1.50 +0.1/-0	1.75± 0.1	5.5 ±0.05	4.0±0.1	4.0±0.1	2.0±0.1	12.0 ±0.2	1.20±0.15	1.5±0.05

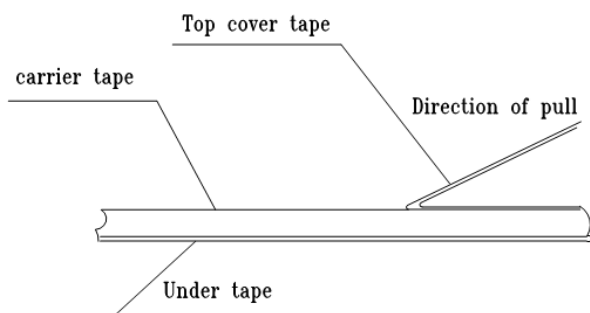
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10 上胶带剥离力测试 (Peel force of top cover tape)

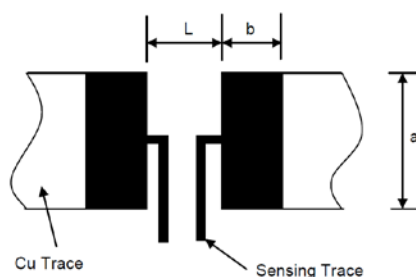
上胶带以 300mm/分钟的速度，沿 165~180 度角的方向进行剥离，如下图所示。纸带的剥离力范围为 10g~70g；载带的剥离力范围为 30~100g

The top cover tape is pulled at a speed of 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)



11 焊接 (soldering)

11.1 建议焊盘尺寸 (Recommended Solder Pad Dimension)

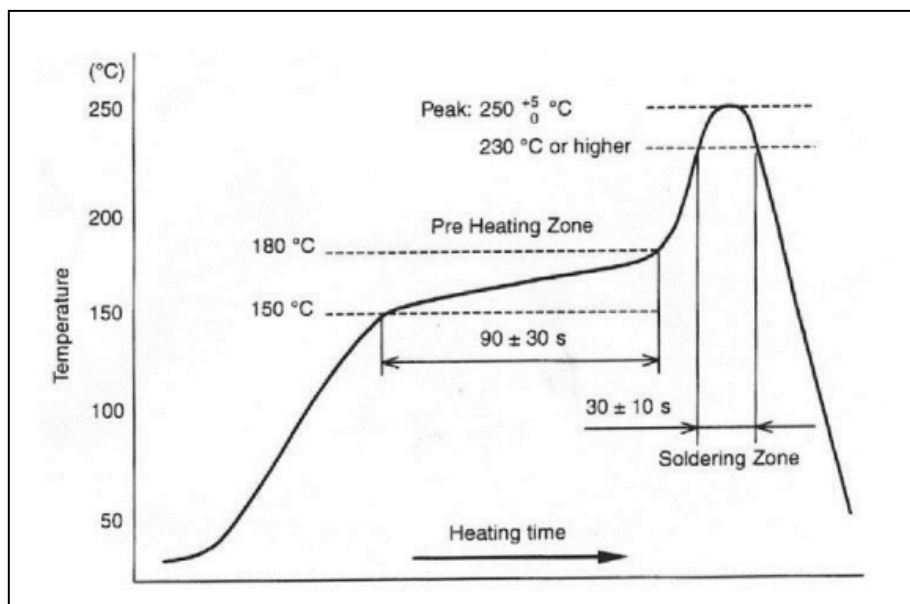


Unit: mm

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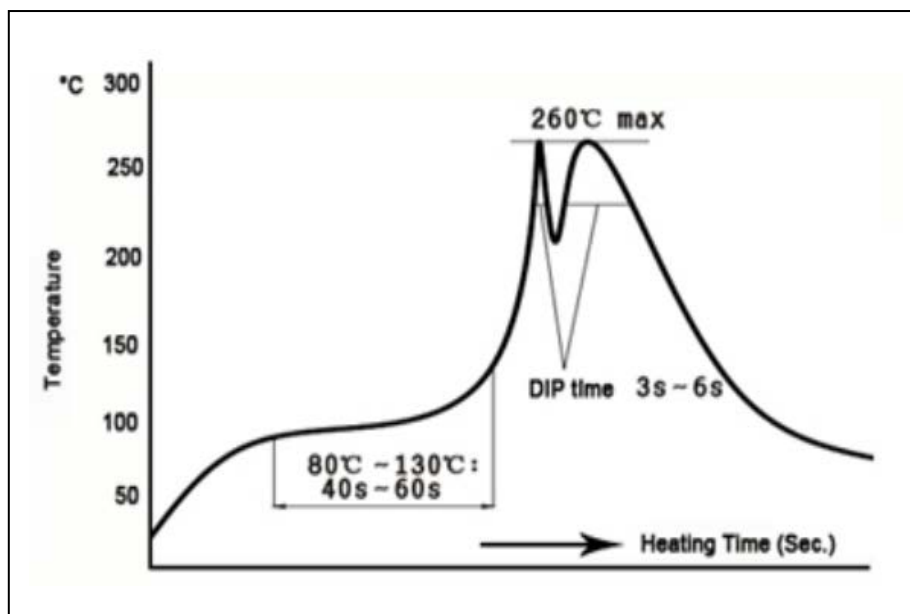
尺寸 Dimensions	阻值范围 Resistance Range	a	b	L
AM1206*T	1mΩ	1.8±0.1	2.3±0.1	1.0±0.1
AM1206*M	2mΩ~100mΩ	1.8±0.1	1.7±0.1	1.6±0.1
AM2512*T	1mΩ~4mΩ	4.0±0.1	3.1±0.1	1.3±0.1
AM2512*M	3mΩ~300mΩ	4.0±0.1	2.1±0.1	4.1±0.1

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



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



11.4 手工焊温度 (hand soldering temperature)

烙铁温度 $350\pm 10^{\circ}\text{C}$ ，3 秒之内，避免烙铁接触电阻本体

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

★所有产品规格改变不再另行通知

★All product specification and data are subject to change without notice.