

规格书

SPECIFICATION

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## 合金箔贴片电阻规格书-RE 系列

### Approval Specification Metal Foil Current Sensing Chip Resistors-Type RE

#### 1. 范围 (scope) :

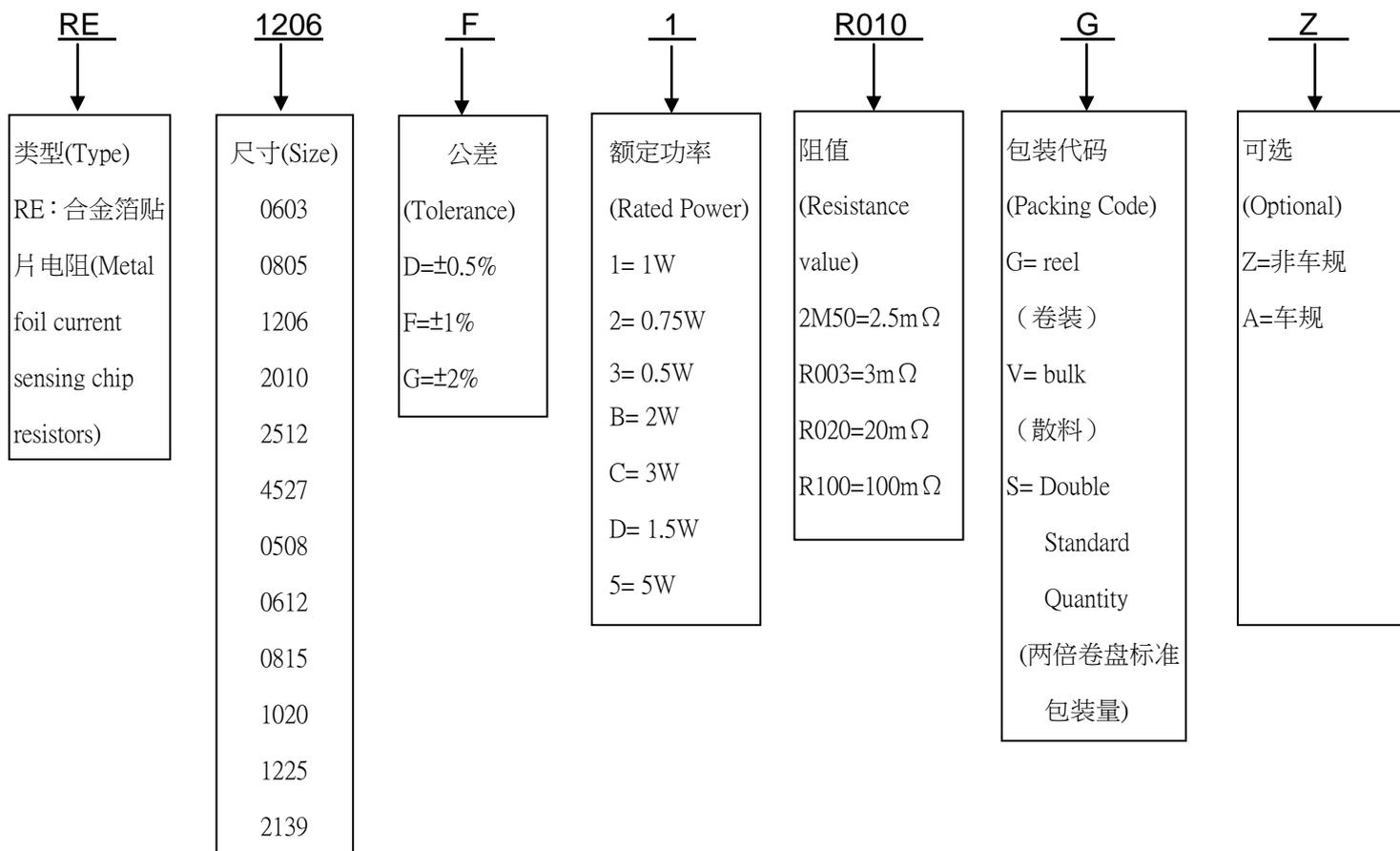
适用于本公司所生产的无铅、无卤之合金贴片电阻 RE 系列

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

#### 2. 产品料号 (part number) :

1206 1% 1W 10mΩ

RE1206F1R010GZ



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

±0.5%,±1%,±2%的产品，以 4 字码标示，第一位字码 R 标示  $10^{-3}$ ，后 3 位表示阻值的有效数字，第二位字码 M 表示阻值小数点。

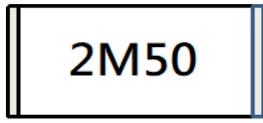
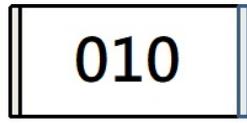
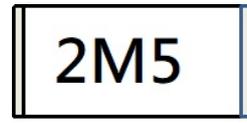
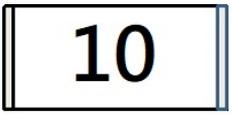
※ 0805±0.5%,±1%,±2%的产品，以 3 或 4 字码标示，表示阻值的有效数字。

※ 0603±0.5%,±1%,±2%的产品，以 2 或 3 字码标示，表示阻值的有效数字。

±0.5%,±1%,±2%, tolerance product: the marking is 4 digits, The first letter 'R' denotes  $10^{-3}$ , The other three digitals declare resistance. The second letter 'M' mean point.

(0805 ±0.5%,±1%,±2%, tolerance product: the marking is 3 or 4 digits, The digitals declare resistance)

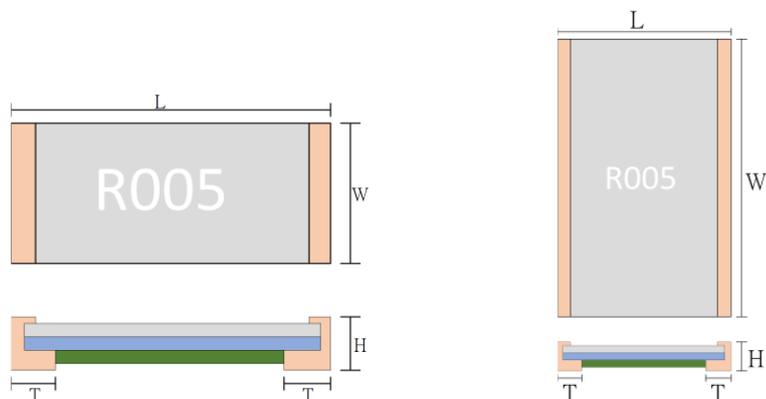
(0603 ±0.5%,±1%,±2%, tolerance product: the marking is 3 or 4 digits, The digitals declare resistance)

R010=10mΩ	2M50=2.5mΩ	010=10mΩ	2M5=2.5mΩ	10=10mΩ
				

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#### 4. 尺寸 (dimension) :

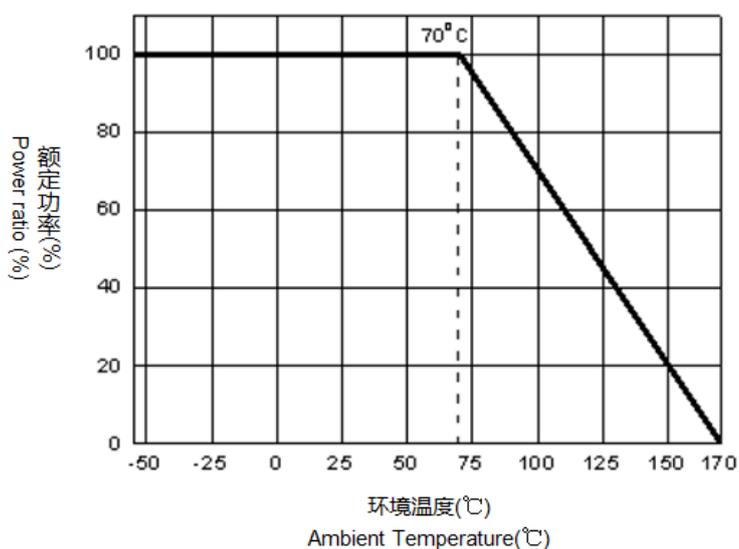


型别 Type	额定功率 Rated Power	阻值范围 Resistance Range	L	W	H	T	
RE0603	0.5W	5mΩ	1.60±0.25	0.80±0.25	0.65±0.20	0.50±0.20	
		6~50mΩ				0.40±0.20	
RE0805	0.75W	4~270mΩ	2.00±0.25	1.20±0.25	0.65±0.20	0.50±0.20	
RE1206	1W	4~700mΩ	3.20±0.25	1.60±0.25	0.65±0.20	0.68±0.30	
RE2010	1.5W	2~3mΩ	5.08±0.25	2.54±0.25	0.65±0.20	2.10±0.30	
		4~500mΩ				0.70±0.30	
RE2512	2W	2mΩ	6.40±0.30	3.20±0.30	0.75±0.20	1.65±0.30	
		mΩ				0.75±0.20	1.65±0.30
		4~560mΩ				0.65±0.20	1.05±0.30
RE4527	5W	10~50mΩ	11.60±1.0	7.10±1.0	0.65±0.30	2.70±0.40	
RE0508	1W	1~100mΩ	1.35±0.20	2.10±0.20	0.65±0.20	0.43±0.20	
RE0612	1.5W	1mΩ	1.60±0.25	3.20±0.25	0.65±0.20	0.50±0.30	
		2~100mΩ				0.40±0.20	
RE0815	2W	1~20mΩ	2.20±0.20	3.80±0.20	0.65±0.20	0.61±0.20	
RE1020	2W	1~9mΩ	2.50±0.30	5.00±0.30	0.65±0.20	0.65±0.20	
RE1225	3W	1~100mΩ	3.20±0.30	6.40±0.30	0.65±0.20	0.60±0.20	
RE2139	5W	1~100mΩ	5.10±0.40	11.10±0.30	0.65±0.30	0.90±0.30	

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#### 5. 功率衰减曲线 ( Derating Curve ) :



工作温度范围

( Operating Temperature Range ) :

-55°C ~ +155°C;

储存条件 ( storage condition ) :

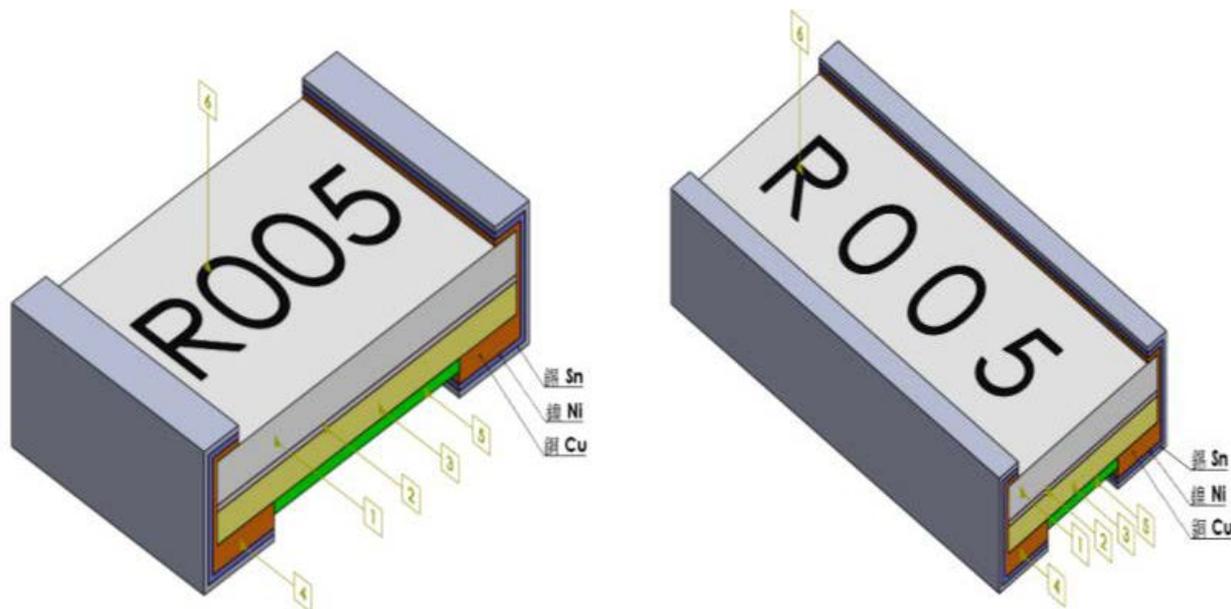
25°C ± 5°C, 60% ± 2% RH.

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	陶瓷基板 Ceramic substrate	三氧化二铝 Al <sub>2</sub> O <sub>3</sub>
2	黏合剂 Adhesive	环氧树脂 Epoxy
3	阻体 Resistive layer(Metal Alloy)	合金 Metal Alloy
4	电极 plating layer	铜 镍 锡 Cu Ni Sn
5	保护层 Protective layer	环氧树脂 Epoxy
6	文字 Marking	环氧树脂 Epoxy

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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			温度特性 TCR (ppm/°C)	最高额定电流 Max Rating Current (A)	最高过载电流 Max Overload Current(A)	Material
		D(±0.5%)	F(±1%)	G(±2%)				
RE0603	0.5W	—	5~9	—	±75	10A	15.81A	R005~R050 : Mn Cu
		10~50		—	±50	7.07A	11.18A	
RE0805	0.75W	—	4~9	—	±75	13.69A	21.65A	R004~R049 : Mn Cu
		10~270		—	±50	8.66A	13.69A	R050~R270 : Cu Alloy
RE1206	1W	—	4~9	—	±75	15.81A	25A	R004~R049 : Mn Cu
		10~700		—	±50	10A	15.81A	R050~R700 : Cu Alloy
RE2010	1.5W	—	2~9	—	±100	27.38A	43.30A	R002~R500 : Cu Alloy
		10~500		—	±50	12.24A	19.36A	
RE2512	2W	—	2~9	—	±75	31.62A	50A	R002~R049 : Mn Cu
		10~560		—	±50	14.14A	22.36A	R050~R560 : Cu Alloy
RE4527	5W	—	—	—	—	—	—	R010~R050 : Cu Alloy
		10~50		—	±50	22.36A	35.35A	
RE0508	1W	—	—	1	±100	31.62A	50A	R001~R009 : Mn Cu R010~R100 : Cu Alloy
		—	2~9	—	±100	22.36A	35.35A	
		10~100		—	±50	10A	15.81A	
RE0612	1.5W	—	—	1	±100	38.72A	61.23A	R001~R009 : Mn Cu R010~R100 : Cu Alloy
		—	—	—	±100	27.38A	43.30A	
		10~100		—	±50	12.24A	19.36A	
RE0815	2W	—	—	1	±100	44.72A	70.71A	R001~R020 : Cu Alloy
		—	2~9	—	±100	31.62A	50A	
		10~20		—	±50	14.14A	22.36A	
RE1020	2W	—	1~9	—	±100	44.72A	70.71A	R001~R009 : Mn Cu
RE1225	2W	—	1~9	—	±100	54.77A	86.60A	R001~R020 : Mn Cu
		10~100		—	±50	17.32A	27.38A	R021~R100 : Cu Alloy
RE2139	5W	—	1~9	—	±100	70.71A	111.8A	R001~R020 : Mn Cu
		10~100		—	±50	22.36A	35.35A	R021~R100 : Cu Alloy

#### 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)      R: 电阻阻值 (Resistance) (ohm)

P: 额定功率 (Rated Power) (W)

※ 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
温度系数 Temperature Coefficient	JIS-C5201-1 4.8	$TCR = (R - R_0) / (t - t_0) R_0 \times 10^6 \text{ (ppm)}$ R <sub>0</sub> 电阻在室温下的阻值(resistance at room temperature) R 电阻在 125℃下的阻值(resistance at 125℃) t <sub>0</sub> 室温(room temperature) t 测试温度 125℃ (test temperature 125℃)	参照规格表 As Spec.
短时间过负荷 Short-time overload	JIS-C5201-1 4.13	加载 2.5 倍的额定功率，时间 5 秒后测量试验前后的阻值变化率。 Applied 2.5 times of rated power for 5 second. Measure the variation of resistance. $\Delta R\% = (R_2 - R_1) / R_1 \times 100 \text{ ----- ( \% )}$ R <sub>1</sub> = 试验前阻值(resistance before test) R <sub>2</sub> = 试验后阻值(resistance after test)	±1.0%+0.5mΩ
高温储存 High Temperature Exposure	JIS-C5201-1 4.25	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. $\Delta R\% = (R_2 - R_1) / R_1 \times 100 \text{ ----- ( \% )}$ R <sub>1</sub> = 试验前阻值(resistance before test) R <sub>2</sub> = 试验后阻值(resistance after test)	±1.0%+0.5mΩ
低温储存 Low Temperature operation	IEC60115-1 4.23.4	-55℃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=-55℃. Measure the variation of resistance at 24±4 hours after test conclusion. $\Delta R\% = (R_2 - R_1) / R_1 \times 100 \text{ ----- ( \% )}$ R <sub>1</sub> = 试验前阻值(resistance before test) R <sub>2</sub> = 试验后阻值(resistance after test)	±1.0%+0.5mΩ

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内容 Item	测试方法 Test Methods	测试条件 Test Conditions	规格 Specification
抗焊锡热 Resistance to soldering heat	JIS-C5201-1 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。 Dip the terminal in a flux and then dip into a soldering bath at $260\pm 5^{\circ}\text{C}$ for $10\pm 1\text{sec}$ . Measure the variation of resistance.	$\pm 1.0\% + 0.5\text{m}\Omega$
耐湿特性 Humidity	JIS-C-5201-1 4.24	电阻放入恒温恒湿箱，温度 $40\pm 2^{\circ}\text{C}$ ，湿度 $90\sim 95\% \text{RH}$ ；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 $1000^{+48}/_{-0}$ 小时。量测试验前后阻值变化率。 Put the specimen in a chamber at $40\pm 2^{\circ}\text{C}$ temperature and $90\sim 95\%$ relative humidity, then applied rated voltage for 1.5H and rested for 0.5H repeatedly till total test time is $1000^{+48}/_{-0}$ . Measure the variation of resistance. $\Delta R\% = \frac{R_2 - R_1}{R_1} * 100 \text{-----} (\%)$ R1 = 试验前阻值(resistance before test) R2 = 试验后阻值(resistance after test)	$\pm 2.0\% + 0.5\text{m}\Omega$
温度循环 Temperature Cycling	JIS-C-5201-1 4.19	电阻放入温度循环机中，温度 $155\pm 2^{\circ}\text{C}$ 至 $-55\pm 3^{\circ}\text{C}$ ，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 $155\pm 2^{\circ}\text{C}$ or $-55\pm 3^{\circ}\text{C}$ , repeated 5 times. Measure the variation of resistance. $\Delta R\% = \frac{R_2 - R_1}{R_1} * 100 \text{-----} (\%)$ R1 = 试验前阻值(resistance before test) R2 = 试验后阻值(resistance after test)	$\pm 1.0\% + 0.5\text{m}\Omega$

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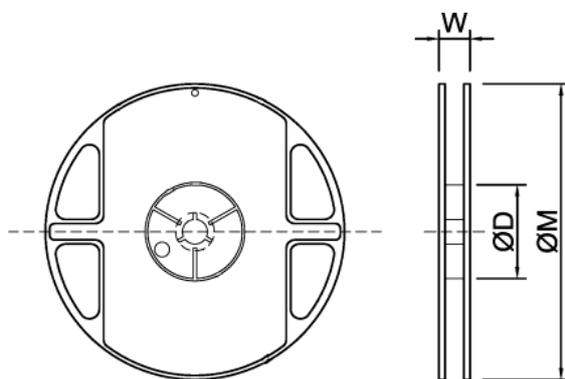
内容 Item	测试方法 Test Methods	测试条件 Test Conditions	规格 Specification
负荷寿命 Load Life	JIS-C5201-1 4.25	电阻放入恒温箱中，温度 $70\pm 2^{\circ}\text{C}$ ，通电额定电流 1.5 小时，断电 0.5 小时；重复通断电至试验时间 $1000 +48/-0$ 小时。量测试验前后阻值变化率。 Put the specimen in a chamber at $70\pm 2^{\circ}\text{C}$ temperature , and applied rated Current for 1.5H and rested for 0.5H repeatedly till total test time is $1000 +48/-0$ .. Measure the variation of resistance.	$\pm 2.0\% + 0.5\text{m}\Omega$
焊锡性 Solderability	JIS-C-5201-1 4.17	沾助焊剂后浸入锡炉，锡炉温度 $245\pm 5^{\circ}\text{C}$ ，时间 $3 \pm 1$ 秒 Dip the terminal in a flux and then dip into a soldering bath at $245\pm 5^{\circ}\text{C}$ for $3 \pm 1\text{sec}$ .	最少 95% 面积上锡 (Min 95% coverage)
端子弯曲 Board Flex	JIS-C5201-1 4.33	弯曲 2mm，10 秒，量测试验前后阻值变化率。 Bending once for 2mm, 10 seconds.	$\pm 1.0\% + 0.5\text{m}\Omega$

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### Approval Specification Metal Foil Current Sensing Chip Resistors-Type RE

#### 9. 包装规格 (Tapping Specification) :

##### a) 卷盘尺寸 (reel dimension)



单位 (unit) : mm (Inch)

型别 Type	W	M	φ D
RE0603 / RE0805 / RE1206 / RE0508 / RE0612	9.00±1.00 (0.354±0.039)	178±5.00 (7.008±0.197)	60.00±2.00 (2.362±0.079)
RE2010 / RE2512 / RE0815 / RE1225 / RE1020	13.00±1.00 (0.512±0.039)		
RE4527 / RE2139	24.50±1.00 (0.965±0.039)		

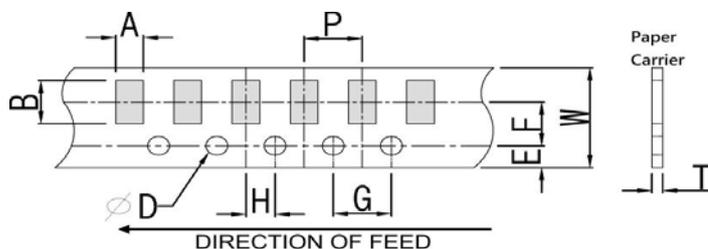
#### ※ 备注 (Remark) :

型别 Type	件/卷 pcs/Reel
RE0805 / RE0508	5000
RE1206 / RE0612	5000
RE2010 / RE1020	4000
RE2512 / RE1225	4000
RE0815	4000
RE2139	2000
RE4527	1000

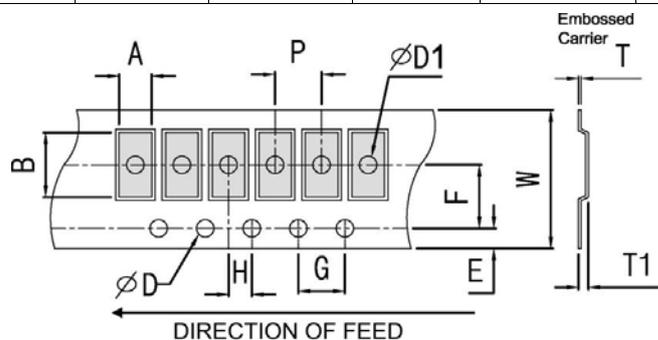
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b) 包装尺寸 (packing dimension) :



型别 Type	W	P	E	F	$\phi D$	G	H	A	B	T
RE0603	8.0±0.30	4.0±0.10	1.75±0.10	3.5±0.10	1.5 +0.1/-0	4.0±0.10	2.0±0.10	1.18±0.20	1.98±0.20	0.75±0.20
RE0805								1.68±0.20	2.38±0.20	0.87±0.20
RE0508								1.68±0.20	2.38±0.20	0.87±0.20
RE1206								2.05±0.20	3.65±0.20	0.87±0.10
RE0612								2.05±0.20	3.65±0.20	0.87±0.10



型别 Type	W	P	E	F	$\phi D$	G	H	A	B	T1	T
RE0815	12±0.40	4.0±0.10	1.75±0.10	5.5±0.10	1.5 +0.1 /-0	4.0±0.10	2.0±0.1 0	2.40±0.20	4.10±0.20	0.75±0.20	0.25±0.10
RE2010	12±0.30	4.0±0.10	1.75±0.10	5.5±0.10		4.0±0.10	2.0±0.1 0	2.85±0.20	5.45±0.20	0.80±0.20	0.25±0.10
RE1020						4.0±0.10	2.0±0.1 0	3.40±0.20	6.75±0.20	1.0±0.20	0.25±0.10
RE2512	12±0.30	4.0±0.10	1.75±0.10	5.5±0.10		4.0±0.10	2.0±0.1 0	5.5±0.20	11.5±0.20	9.0±0.20	0.3±0.10
RE1225						4.0±0.10	2.0±0.1 0	7.5±0.20	12.0±0.20	9.0±0.20	0.3±0.10
RE2139	24±0.30	8.0±0.10	1.75±0.10	11.5±0.10		4.0±0.10	2.0±0.1 0	5.5±0.20	11.5±0.20	9.0±0.20	0.3±0.10
RE4527	24±0.30	12.0±0.10	1.75±0.10	11.5±0.10	4.0±0.10	2.0±0.1 0	7.5±0.20	12.0±0.20	9.0±0.20	0.3±0.10	

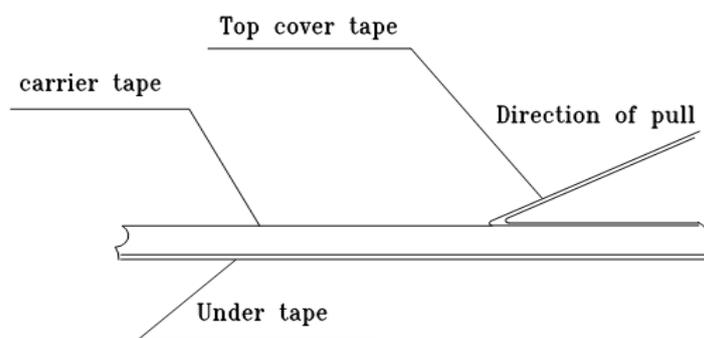
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#### 10. 上胶带剥离力测试 (Peel force of top cover tape) :

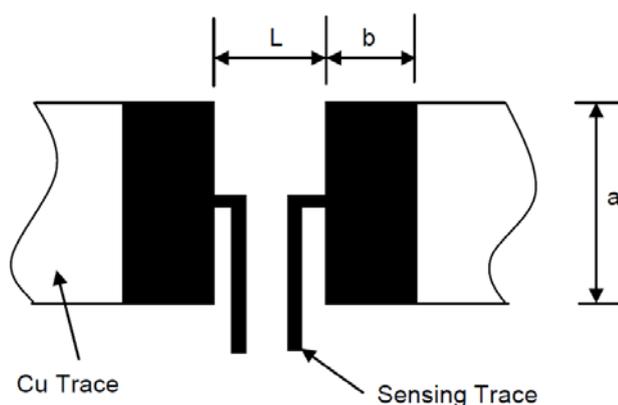
上胶带以 300mm/分钟的速度，沿 165~180 度角的方向进行剥离，如下图所示。纸带的剥离力范围为 0.1N~0.7N(10g~70g)；载带的剥离力范围为 0.3N~1N(30~100g)

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)

##### a) 建议焊盘尺寸 (Recommended Solder Pad Dimension)



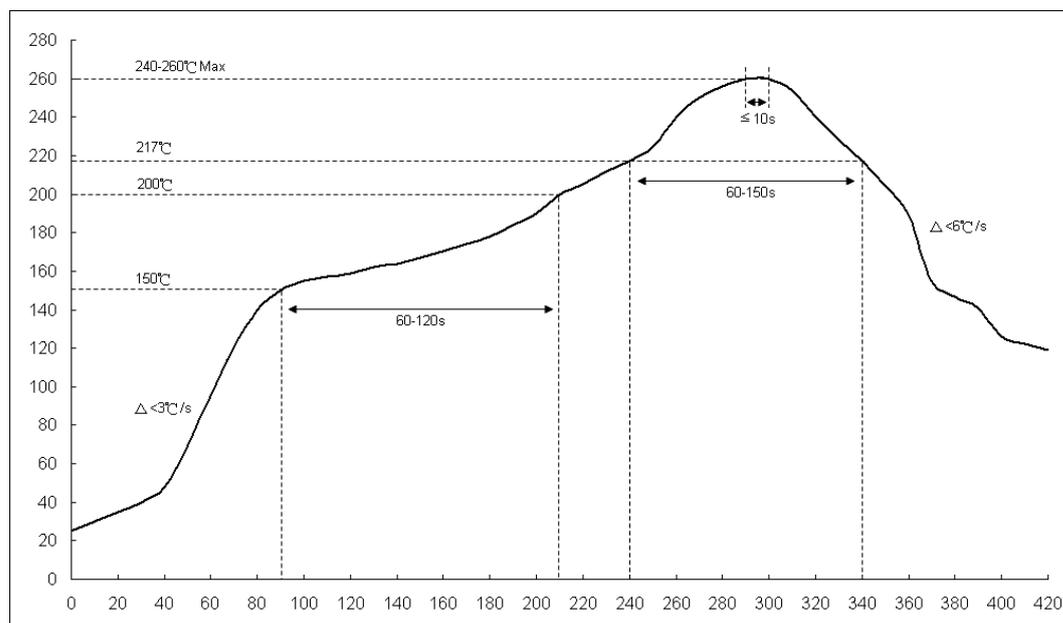
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单位 (unit) : mm

型别 Type	阻值范围 Resistance Range	b	a	L
RE0603 – 0.5W	5mΩ	1.35	0.92	0.50
	6mΩ~50mΩ	1.30	0.92	0.60
RE0805 – 0.75W	4mΩ~270mΩ	1.40	1.44	0.80
RE1206 – 1W	4mΩ~700mΩ	1.80	1.84	1.20
RE2010– 1.5W	2~3mΩ	3.65	2.88	0.70
	4mΩ~500mΩ	2.65	2.88	2.70
RE2512 – 2W	2~3mΩ	3.85	3.57	1.6
	4~560mΩ	3.10	3.57	3.10
RE4527 – 5W	10mΩ~50mΩ	4.65	8.05	5.20
RE0508– 1W	1~100mΩ	1.10	2.30	0.60
RE0612 – 1.5W	1mΩ	1.35	3.68	0.50
	2~100mΩ	1.30	3.68	0.60
RE0815 – 2W	1~20mΩ	1.40	4.26	0.70
RE1020 – 2W	1~9mΩ	2.25	5.75	1.00
RE1225 – 3W	1~100mΩ	2.35	7.25	1.40
RE2139 – 5W	1~100mΩ	2.80	12.65	2.40

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



## 合金箔贴片电阻规格书-RE 系列

### Approval Specification Metal Foil Current Sensing Chip Resistors-Type RE

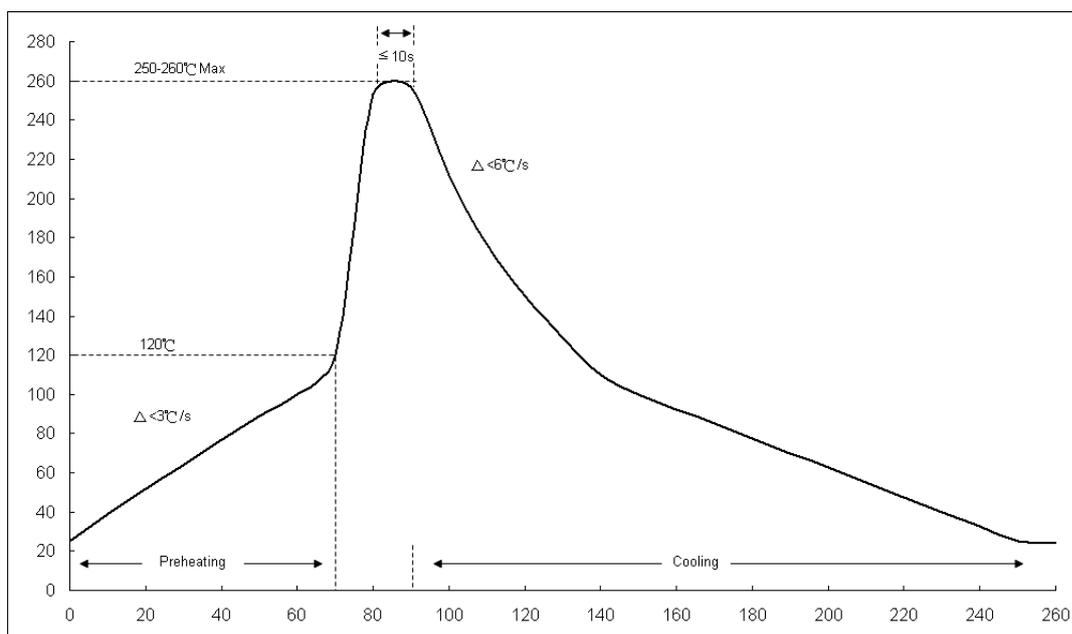
※ 推荐的回流方法 IR、蒸汽炉、热风炉

如果回流温度超过推荐的曲线，器件可能无法满足性能

IR、vapor phase oven、hot air oven

If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements

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



#### d) 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.