

合金箔贴片电阻承认书-RA 系列

Approval Specification Metal Foil Current Sensing Chip Resistors-Type RA

承认书

APPROVAL SHEET

厂商: 丽智电子(南通)有限公司

客户: _____

Supplier: LIZ Electronics (Nantong) Co.,Ltd

Customer: _____

制作 Prepared by	审核 Checked by	核准 Approved by	客户 Customer

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1 范围 (scope) :

1.1 适用于本公司所生产的无铅、无卤之合金箔贴片电阻 RA 系列

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

1.2 符合 AEC-Q200 條款

The relevant provisions of the AEC-Q200

2 产品料号 (part number) :

1206 1% 1W 10mΩ

RA1206F1R010G

<u>RA</u>	<u>1206</u>	<u>F</u>	<u>B</u>	<u>R010</u>	<u>G</u>
↓	↓	↓	↓	↓	↓
类型 (Type)	尺寸 (Size)	公差 (Tolerance)	额定功率 (Rated Power)	阻值 (Resistance value)	包装代码 (Packing Code)
RA: 合金箔 贴片电阻 (Metal foil current sensing chip resistors)	1206 0805 0603	D=±0.5% F=±1% J=±5%	1= 1W 2= 0.75W 3= 0.5W	R002=2mΩ 010=10 mΩ 02=2mΩ	G= reel (卷装) V= bulk (散料)

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

$\pm 0.5\%$, $\pm 1\%$, $\pm 2\%$, $\pm 5\%$ 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。

※ 0805 产品以三字码标示, 表示阻值的有效数字。

※ 0603 产品以二字码标示, 表示阻值的有效数字。

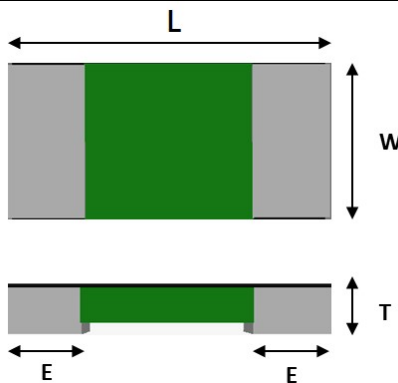
$\pm 0.5\%$, $\pm 1\%$, $\pm 2\%$, $\pm 5\%$ tolerance product: the marking is 4 digits, The first letter 'R' denotes 10^{-3} , The other three digitals declare resistance. The second letter 'R' mean point.

(0805 product the marking is 3 digits, The digitals declare resistance)

(0603 product the marking is 2 digits, The digitals declare resistance)

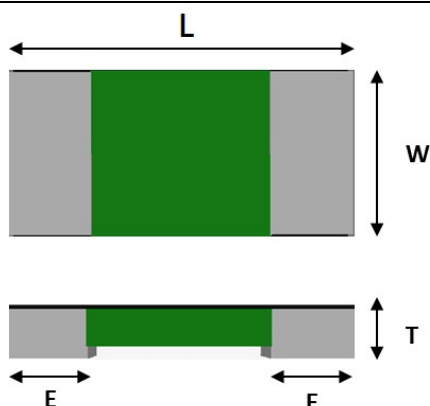
R010=10mΩ	0805=10 mΩ	0603=10 mΩ
R010	010	10

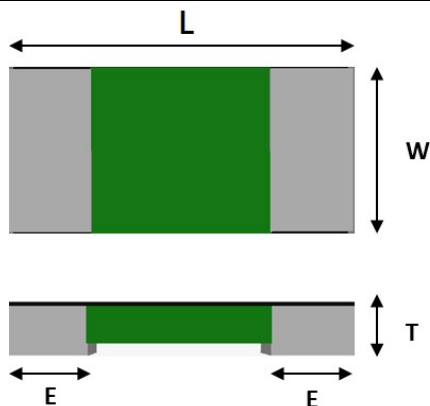
4 尺寸 (dimension) :

尺寸 dimension					
		单位 (unit) : mm			
型别 Type		L	W	T	E
0603	2mΩ	1.6±0.20	0.80±0.20	Max 0.40	0.50±0.15
	3~4mΩ	1.6±0.20	0.80±0.20	Max 0.40	0.35±0.15
	5~20mΩ	1.6±0.20	0.80±0.20	Max 0.35	0.35±0.15

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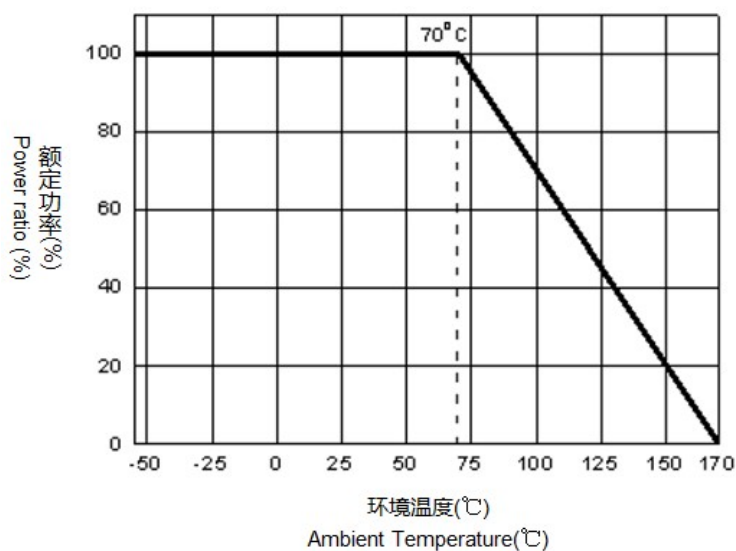
尺寸 dimension					
		单位 (unit) : mm			
型别 Type		L	W	T	E
0805	1mΩ	2.06±0.25	1.26±0.25	0.40±0.10	0.63±0.20
	2mΩ	2.06±0.25	1.26±0.25	0.40±0.10	0.48±0.20
	3~4mΩ	2.06±0.20	1.26±0.20	Max 0.45	0.43±0.15
	5~20mΩ	2.06±0.20	1.26±0.20	Max 0.40	0.43±0.15

尺寸 dimension					
		单位 (unit) : mm			
型别 Type		L	W	T	E
1206	1mΩ	3.20±0.25	1.60±0.25	0.45±0.10	1.15±0.20
	2mΩ	3.20±0.25	1.60±0.25	0.45±0.10	0.95±0.20
	3mΩ	3.20±0.20	1.60±0.20	Max 0.45	0.85±0.15
	4~5mΩ	3.20±0.20	1.60±0.20	Max 0.40	0.85±0.15
	6~20mΩ	3.20±0.20	1.60±0.20	Max 0.40	0.58±0.15

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5 功率衰减曲线（ Derating Curve）：



工作温度范围

（Operating Temperature Range）：

-55°C~+170°C；

储存条件（storage condition）：

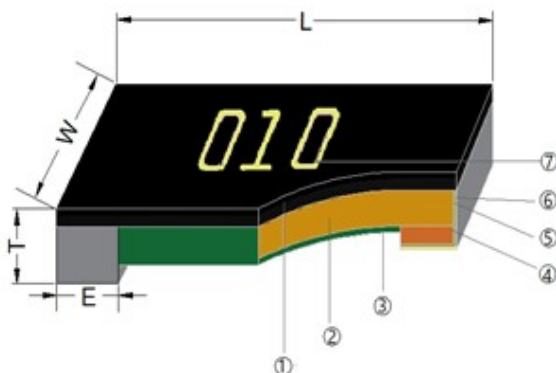
5~30°C, 30~75%RH. (湿敏等级 1)

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	保护层 Protective layer	聚酰亚胺 Polyimide
2	阻体 Resistive layer(Metal Alloy)	合金 Metal Alloy
3	保护层 Protective layer	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	雾锡 Sn
7	字码 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(A) Max Rating Current (A)	最高过载电流 (A) Max Overload Current(A)
		D(±0.5%)、F(±1%)、J(±5%)			
0603	0.5W	2 mΩ~3mΩ	±150	15.8	35.36
		4mΩ~5mΩ	±100	11.18	25.0
		6mΩ~20mΩ	±75	9.13	20.41
0805	0.75 W	1mΩ	±200	27.39	61.24
		1.5mΩ~2mΩ	±150	22.36	50
		3mΩ~5mΩ	±75	15.8	35.36
		6mΩ~20mΩ	±50	11.18	25.0
1206	1W	1mΩ	±100	31.62	70.71
		1.5mΩ~4mΩ	±75	25.82	57.74
		5mΩ~20mΩ	±50	14.14	31.62

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	JIS-C5201- 14.13	施加过负荷额定功率 5 秒后,测量试验前后的阻值变化率。 Apply the overload rated power for 5 seconds. Measure the variation of resistance. $\Delta R\%=(R2-R1)/R1*100$ R1＝试验前阻值(resistance before test) R2＝试验后阻值(resistance after test) (过负荷条件参照下表) <table><tr><th>Type</th><th>Resistance(mΩ)</th><th>power rating</th></tr><tr><td>0603</td><td>2≤R≤10</td><td>4 times</td></tr><tr><td rowspan="2">0805</td><td>1≤R≤10</td><td>4 times</td></tr><tr><td>10≤R≤25</td><td>3 times</td></tr><tr><td rowspan="2">1206</td><td>1≤R≤10</td><td>4 times</td></tr><tr><td>10≤R≤200</td><td>3 times</td></tr></table>	Type	Resistance(mΩ)	power rating	0603	2≤R≤10	4 times	0805	1≤R≤10	4 times	10≤R≤25	3 times	1206	1≤R≤10	4 times	10≤R≤200	3 times	≤±1.0%
Type	Resistance(mΩ)	power rating																	
0603	2≤R≤10	4 times																	
0805	1≤R≤10	4 times																	
	10≤R≤25	3 times																	
1206	1≤R≤10	4 times																	
	10≤R≤200	3 times																	
温度系数 Temperature Coefficient	JIS-C5201- 14.8	$TCR= (R-R_0) / (t-t_0) R_0 \times 10^6 \text{ (ppm)}$ R ₀ 电阻在室温下的阻值(resistance at room temperature) R 电阻在 125℃下的阻值(resistance at 125℃) t ₀ 室温(room temperature) t 测试温度 125℃ (test temperature 125℃)	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 1000 hours Note: 10% Rated power at 85℃, RH:85%, 1000Hrs, Measurement at 24hrs after test conclusion.	1-10mR, ΔR≤±1% 11-20mR, ΔR≤±2%																
温度循环 Temperature cycling	MIL-STD 202 Method107G	-55℃&+150℃, 温度保留 15min, 循环 300 次, 试验结束 24±4 小时后量测试前后阻值变化率. 300Cycle (-55℃ to 150℃) , Temperature retention for 15 minutes, Measurement at 24hrs after test conclusion.	≤±1.0%																

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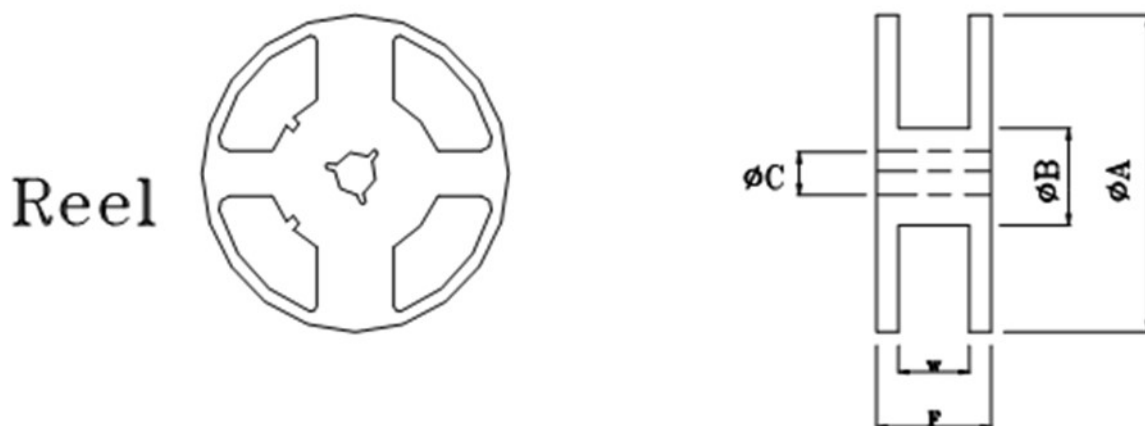
内容 Item	测试方法 Test Methods	测试条件 Test Conditions	规格 Specification
Load Life 负荷寿命	JIS-C5201- 14.25	电阻放入恒温箱中，温度 $70\pm 2^{\circ}\text{C}$ ，通电额定电流 1.5 小时，断电 0.5 小时；重复通断电至试验时间 $1000 +48/-0$ 小时。量测试验前后阻值变化率。 Put the specimen in a chamber at $70\pm 2^{\circ}\text{C}$ temperature, and applied rated Current for 1.5H and rested for 0.5H repeatedly till total test time is $1000 +48/-0$.. Measure the variation of resistance.	1206: 1-9mR $\Delta R \leq \pm 1\%$ 10-14mR $\Delta R \leq \pm 3\%$ 15-20mR $\Delta R \leq \pm 4\%$ 0805: 1-10mR $\Delta R \leq \pm 1\%$ 11-20mR $\Delta R \leq \pm 3\%$ 0603: 2-10mR $\Delta R \leq \pm 1\%$
高温储存 High Temperature Exposure (Storage)	IEC60115- 14.25	150°C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=150°C. Measure the variation of resistance at 24 ± 4 hours after test conclusion.	$\leq \pm 1.0\%$
Low temperature Exposure (Storage)	IEC60115- 14.23.4	-55°C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°C. Measure the variation of resistance at 24 ± 4 hours after test conclusion.	
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 $260\pm 5^{\circ}\text{C}$ ，时间 12 ± 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 $260\pm 5^{\circ}\text{C}$ for $12\pm 0.5\text{sec}$. Measure the variation of resistance.	$\leq \pm 0.5\%$
焊锡性 Solderability	JIS-C-5201- 14.17	沾助焊剂后浸入锡炉，锡炉温度 $245\pm 5^{\circ}\text{C}$ ，时间 3 ± 0.5 秒 Dip the terminal in a flux and then dip into a soldering bath at $245\pm 5^{\circ}\text{C}$ for $3 \pm 0.5\text{sec}$.	最少 95%面积上锡 (Min 95% coverage)

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9 包装规格 (Tapping Specification)

a) 卷盘尺寸 (reel dimension)



尺寸 Dimensions		A	B	C	F	W
1206	mm	178±2.00	60.00±1.00	13.50±0.50	11.40±0.10	9.00±0.30
0805						
0603	Inch	7.008±0.079	2.362±0.039	0.531±0.020	0.449±0.039	0.354±0.012

备注 (Remark) :

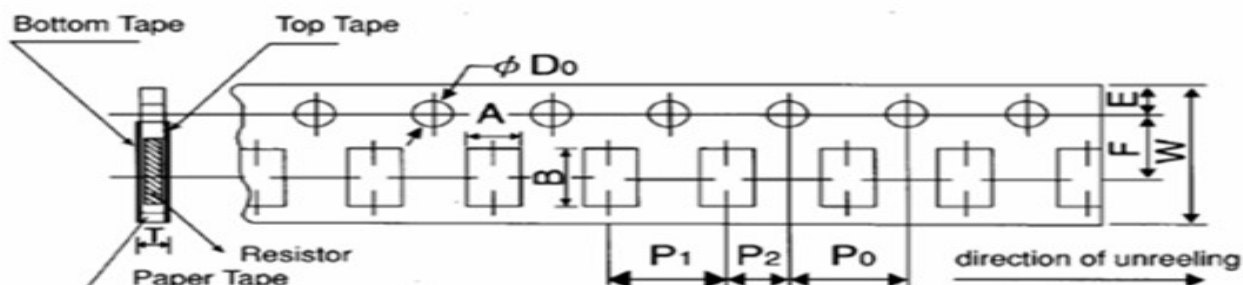
1206/0805/0603 每卷 5,000pcs

1206/0805/0603 Quantity per Reel 5,000 pcs/Reel

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b) 包装尺寸 (packing dimension)



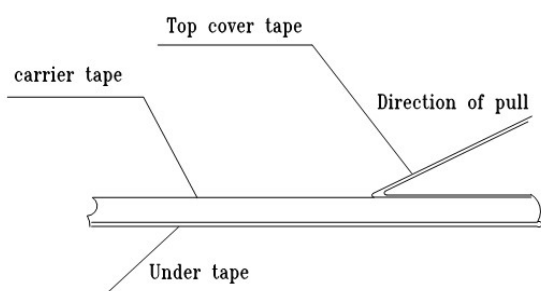
单位:mm

Packing	Type	A	B	W	F	E	P1	P2	P ₀	D ₀	T
Paper Tape	1206	2.00±0.20	3.60±0.2	8.0±0.2	3.5±0.05	1.75±0.1	4.0±0.1	2.0±0.05	4.0±0.1	1.50±0.1	0.55±0.2
	0805	1.66±0.15	2.46±0.2	8.0±0.2	3.5±0.05	1.75±0.1	4.0±0.1	2.0±0.05	4.0±0.1	1.50±0.1	0.55±0.2
	0603	1.00±0.15	1.80±0.2	8.0±0.2	3.5±0.05	1.75±0.1	4.0±0.1	2.0±0.05	4.0±0.1	1.55±0.1	0.60±0.2

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)

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~0.7N(10 ~ 70 g)



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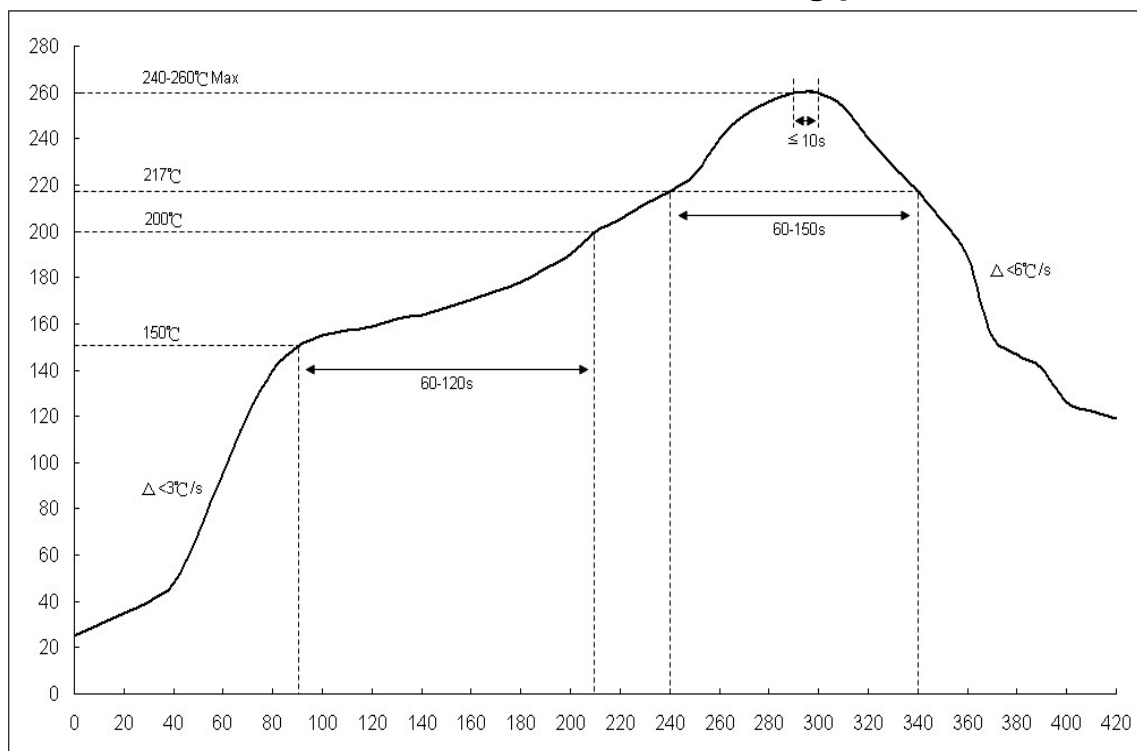
11 焊接 (soldering)

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

单位:mm

	尺寸 Dimensions	阻值范围 Resistance Range	a	b	L
	0603	2mΩ	0.92±0.1	1.35±0.1	0.5±0.1
		3~20mΩ	0.92±0.1	1.30±0.1	0.6±0.1
	0805	1~20mΩ	1.52±0.1	1.45±0.1	0.8±0.1
	1206	1~2mΩ	1.74±0.1	1.95±0.1	0.9±0.1
		3~5 mΩ	1.74±0.1	1.85±0.1	1.0±0.1
		6~20mΩ	1.74±0.1	1.75±0.1	1.2±0.1

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



c) 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

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★产品规格及资料如有更改,恕不另行通知。

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