

UniOhm

Uniroyal Electronics Industry Co., Ltd.

厚 声 电 子 工 业 有 限 公 司

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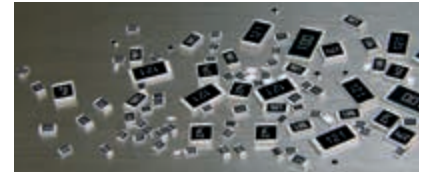


Surface Mount Category - CHIP, CHIP ARRAY & CHIP NETWORK Resistors (表面贴装式 – 晶片电阻, 晶片排列电阻及晶片网络电阻器)

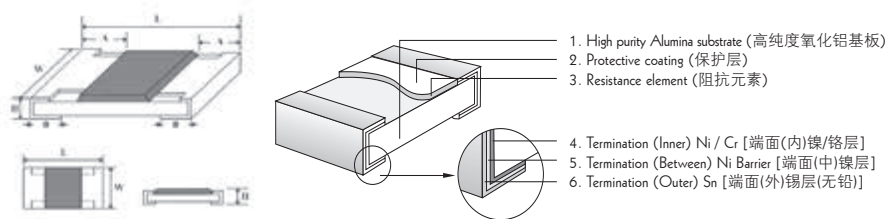
	Thick Film Chip Resistors 厚膜晶片电阻器	3	01005, 0201, 0402, 0603, 0805, 1206, 1210, 1812, 2010, 2512
	High Resistance Thick Film Chip Resistors 高阻厚膜晶片电阻器	6	0603, 0805, 1206, 1210
	Anti-Surge Thick Film Chip Resistors 抗浪涌厚膜晶片电阻器	7	AS03, AS05, AS06, AS07, AS10, AS12
New	High-Precision Anti-Surge Thick Film Chip Resistors 高精度抗浪涌厚膜晶片电阻器	9	PS02, PS03, PS05, PS06, PS07, PS10, PS12
	High-Power Thick Film Chip Resistors 高功率厚膜晶片电阻器	11	HP02, HP03, HP05, HP06, HP07, HP10, HP11, HP12
	Low Resistance High-Power Thick F.C.R. 高功率低阻值厚膜晶片电阻器	13	HP03, HP05, HP06, HP07, HP10, HP11, HP12
	High-Voltage Thick Film Chip Resistors 高压厚膜晶片电阻器	14	HV03, HV05, HV06, HV07, HV10, HV12
	Wide-Terminal Thick Film Chip Resistors 宽电极厚膜晶片电阻器	16	0508, 0612, 1020, 1218, 1225
	Trimable Thick Film Chip Resistors 可调厚膜晶片电阻器	18	TR03, TR05, TR06
	Current Sensing Chip Resistors 晶片电流检测电阻器	20	CS02, CS03, CS05, CS06, CS07, CS10, CS11, CS12
New	Metal Strip Current Sensing Chip Resistors - MS 金属带电流检测片式电阻器	22	MS06, MS07, MS10, MS11, MS12, MS17, MS20, MS27
New	Anti-Electro Static Discharge Thick Film Chip Resistors - ES 抗静电膜晶片电阻器	24	ES01, ES02, ES03, ES05, ES06, ES07
New	Low T.C.R Thick Film Chip Resistors - LT 低温度系数厚膜晶片电阻器	26	LT02, LT03, LT05, LT06
New	AEC-Q200 Version Chip Resistors - HQ 汽车用晶片电阻器	28	HQ02, HQ03, HQ05, HQ06, HQ07, HQ10, HQ12
New	Non-magnetic Thick Film Chip Resistors - NM 无磁厚膜晶片电阻器	30	NM02, NM03, NM05
New	Anti-Sulfurized Thick Film Chip Resistors - NS 抗硫化厚膜晶片电阻器	32	NS01, NS02, NS03, NS05, NS06, NS07, NS10, NS12
New	Common Quality Anti-Sulfurized Chip Resistor- 普通品质抗硫磺晶片电阻器	34	CQ02, CQ03, CQ05, CQ06, CQ07, CQ10, CQ12
	Flex LED Strip use Thick Film Chip Resistors - LE 软灯条专用电阻器	36	LE03, LE05, LE06
New	High-Precision Thin Film Chip Resistors 高精度薄膜晶片电阻器	38	TC02, TC03, TC05, TC06, TC07, TC10, TC12
	High Power Thin Film Chip Resistors 高功率薄膜晶片电阻器	40	TP03, TP05, TP06, TP07, TP10, TP12
	Thin Film Chip Resistors 薄膜晶片电阻器	41	TC02, TC03, TC05, TC06
	Chip Resistors Array - Convex Terminal 晶片排列电阻器 – 凸式电极	42	2D02, 2D03, 4D02, 4D03, 4DP3, 16P8
New	Anti-Sulfurized Thick Film Chip Resistor Array-Convex Terminal- 抗硫磺厚膜晶片排列电阻器	43	2S02, 4S02, 4S03
	Chip Resistors Array - Concave Terminal 晶片排列电阻器 – 凹式电极	45	2C02, 4C02, 4C03
	Thick Film Chip Resistors Network 厚膜晶片网络电阻器	46	10P8, 10S8, 10T8, 10E9
	Packing of Surface Mount Resistors 表面贴装式电阻器包装	47	Packing of Surface Mount Resistors

Feature (特性)

- Small size & light weight 短小轻薄
- Reduction of assembly costs and matching with placement machine. 可降低装置成本及配合机器组装
- Suitable for both wave & re-flow soldering. 适合波峰焊与回流焊
- Applications: Navigator (GPS), Mobile Phone, Telecom, PDA, Setbox, Meter.
应用于GPS, 移动电话, PDA, 机顶盒, 仪表

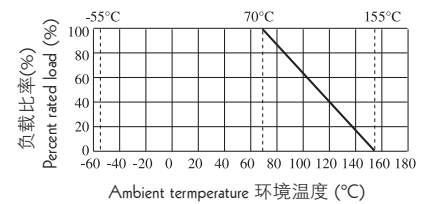


Figures (型状)



Derating Curve & Specification

降功率曲线及性能



Type 类型	01005 New	0201	0402	0603	0805	1206	1210	1812	2010	2512
Max. Working Voltage 最大工作电压	15V	25V	50V	75V	150V	200V	200V	200V	200V	200V
Max. Overload Voltage 最大过负荷电压	30V	50V	100V	150V	300V	400V	500V	500V	500V	500V
Dielectric withstanding Voltage 绝缘耐压	-	-	100V	300V	500V	500V	500V	500V	500V	500V
Operating Temperature 工作温度范围	-55~+155°C	-55~+155°C	-55~+155°C	-55~+155°C	-55~+155°C	-55~+155°C	-55~+155°C	-55~+155°C	-55~+155°C	-55~+155°C

Type 类型	01005 New	0201	0402	0603	0805	1206	1210	1812	2010	2512
Power Rating at 70°C 功率	1/32W	1/20W	1/16W	1/16W (1/10W-S)	1/10W (1/8W-S)	1/8W (1/4W-S)	1/4W (1/3W-S 1/2W-SS)	1/2W (3/4W-S)	1/2W (3/4W-S)	1W
Dimension 尺寸	L (mm)	0.40 ± 0.02	0.60 ± 0.03	1.00 ± 0.10	1.60 ± 0.10	2.00 ± 0.15	3.10 ± 0.15	4.50 ± 0.20	5.00 ± 0.10	6.35 ± 0.10
	W (mm)	0.20 ± 0.02	0.30 ± 0.03	0.50 ± 0.05	0.80 ± 0.10	1.25 ^{+0.15} _{-0.10}	1.55 ^{+0.15} _{-0.10}	2.60 ± 0.20	2.50 ± 0.20	3.20 ± 0.20
	H (mm)	0.13 ± 0.02	0.23 ± 0.03	0.35 ± 0.05	0.45 ± 0.10	0.55 ± 0.10	0.55 ± 0.10	0.55 ± 0.20	0.55 ± 0.10	0.55 ± 0.10
	A (mm)	0.10 ± 0.05	0.10 ± 0.05	0.20 ± 0.10	0.30 ± 0.20	0.40 ± 0.20	0.45 ± 0.20	0.50 ± 0.25	0.60 ± 0.25	0.60 ± 0.25
	B (mm)	0.10 ± 0.03	0.15 ± 0.05	0.25 ± 0.10	0.30 ± 0.20	0.40 ± 0.20	0.45 ± 0.20	0.50 ± 0.20	0.50 ± 0.20	0.50 ± 0.20
Resistance Value of Jumper 零欧姆电阻阻值	-	<50mΩ	<50mΩ	<50mΩ	<50mΩ	<50mΩ	<50mΩ	<50mΩ	<50mΩ	<50mΩ
Rated Current of Jumper 零欧姆电阻额定电流	-	0.5A	1A	1A	2A	2A	2A	2A	2A	2A
Max. Overload Current of Jumper 零欧姆电阻最大过负荷电流	-	1A	2A	2A	5A	10A	10A	10A	10A	10A
Resistance Range of 0.5% (E-96) 0.5% 的阻值范围(E-96)	-	-	1Ω ~ 10MΩ	1Ω ~ 10MΩ	1Ω ~ 10MΩ	1Ω ~ 10MΩ	1Ω ~ 10MΩ	1Ω ~ 10MΩ	1Ω ~ 10MΩ	1Ω ~ 10MΩ
Resistance Range of 1% (E-96) 1% 的阻值范围 (E-96)	10Ω ~ 10MΩ	1Ω ~ 10MΩ	1Ω~10MΩ	0.1Ω~10MΩ	0.1Ω~10MΩ	0.1Ω~10MΩ	0.1Ω~10MΩ	0.1Ω~10MΩ	0.1Ω~10MΩ	0.1Ω~10MΩ
Resistance Range of 2% (E-24) 2% 的阻值范围 (E-24)	10Ω ~ 10MΩ	1Ω ~ 10MΩ	1Ω~10MΩ	0.1Ω~10MΩ	0.1Ω~10MΩ	0.1Ω~10MΩ	0.1Ω~10MΩ	0.1Ω~10MΩ	0.1Ω~10MΩ	0.1Ω~10MΩ
Resistance Range of 5% (E-24) 5% 的阻值范围 (E-24)	1Ω ~ 10MΩ	1Ω ~ 10MΩ	1Ω~10MΩ	0.1Ω~10MΩ	0.1Ω~10MΩ	0.1Ω~10MΩ	0.1Ω~10MΩ	0.1Ω~10MΩ	0.1Ω~10MΩ	0.1Ω~10MΩ

Marking on the Resistors Body (电阻本体字码标示)

- For 01005, 0201, 0402 size, no marking on the body due to the small size of the resistor.
01005, 0201, 0402因电阻本体太小, 故本体无标示字码
- $\pm 5\%$ tolerance product: the marking is 3 digits, the first 2 digits are the significant of the resistance and the 3rd digit denotes number of zeros following.
 $\pm 5\%$ 公差产品字码是三位数, 前二位是阻值的有效数, 第三位表示有几个 0
- 0805, 1206, 1210, 2010, 2512 $\leq \pm 1\%$: the marking is 4 digits, the first 3 digits are the significant of the resistance and the 4th digit denotes number of zeros following.
0805, 1206, 1210, 2010, 2512 $\leq \pm 1\%$ 公差产品字码有四位数, 前三位是阻值的有效数, 第四位表示有几个 0
- Standard E-96 series values of 0603 $\leq \pm 1\%$: due to the small size of the resistor's body, 3 digits marking will be used to indicate the accurate resistance value by using the following Multiplier & Resistance Code.
0603 $\leq \pm 1\%$ 公差 E-96系列标准阻值, 因电阻本体太小, 采用三位阻值代码 (数字) 及下列指数代码 (字母) 配合来指明标准的阻值。

153

$$153 = 15000\Omega = 15K\Omega$$

6R8

$$\text{Below } 10\Omega: 6R8 = 6.8\Omega$$

$$10\Omega \text{ 以下标示: } 6R8 = 6.8\Omega$$

2372

$$2372 = 23700\Omega = 23.7K\Omega$$

3R24

$$\text{Below } 10\Omega: 3R24 = 3.24\Omega$$

$$10\Omega \text{ 以下标示: } 3R24 = 3.24\Omega$$

Multiplier Code (for 0603 $\leq \pm 1\%$ marking) [指数码 (0603 $\leq \pm 1\%$ 标示)]

Code 代码	A	B	C	D	E	F	G	H	X	Y	Z
Multiplier 指数	10^0	10^1	10^2	10^3	10^4	10^5	10^6	10^7	10^{-1}	10^{-2}	10^{-3}

Standard E-96 series Resistance Value code (for 0603 $\leq \pm 1\%$ marking) [E-96系列标准阻值代码 (对0603 $\leq \pm 1\%$ 的字码)]

Value 阻值	Code 代码	Value 阻值	Code 代码	Value 阻值	Code 代码	Value 阻值	Code 代码	Value 阻值	Code 代码	Value 阻值	Code 代码
100	01	147	17	215	33	316	49	464	65	681	81
102	02	150	18	221	34	324	50	475	66	698	82
105	03	154	19	226	35	332	51	487	67	715	83
107	04	158	20	232	36	340	52	499	68	732	84
110	05	162	21	237	37	348	53	511	69	750	85
113	06	165	22	243	38	357	54	523	70	768	86
115	07	169	23	249	39	365	55	536	71	787	87
118	08	174	24	255	40	374	56	549	72	806	88
121	09	178	25	261	41	383	57	562	73	825	89
124	10	182	26	267	42	392	58	576	74	845	90
127	11	187	27	274	43	402	59	590	75	866	91
130	12	191	28	280	44	412	60	604	76	887	92
133	13	196	29	287	45	422	61	619	77	909	93
137	14	200	30	294	46	432	62	634	78	931	94
140	15	205	31	301	47	442	63	649	79	953	95
143	16	210	32	309	48	453	64	665	80	976	96

So the resistance value are marked as the following examples (阻值标示如下):

29B

$$1.96K\Omega = 196 \times 10^1 \Omega = 29B$$

10X

$$12.4\Omega = 124 \times 10^{-1} = 10X$$

- Standard E-24 and not belong to E-96 series values ($\leq \pm 1\%$) of 0603 size: the marking is the same as 5% tolerance but marking as underline.
0603 $\leq \pm 1\%$ 公差, 在标准 E-24 系列中, 但不属 E-96 系列的阻值, 标示和5%的公差相同, 但是在字码下多加一条线

122

$$\underline{122} = 1200 = 1.2 K\Omega$$

680

$$\underline{680} = 68\Omega$$

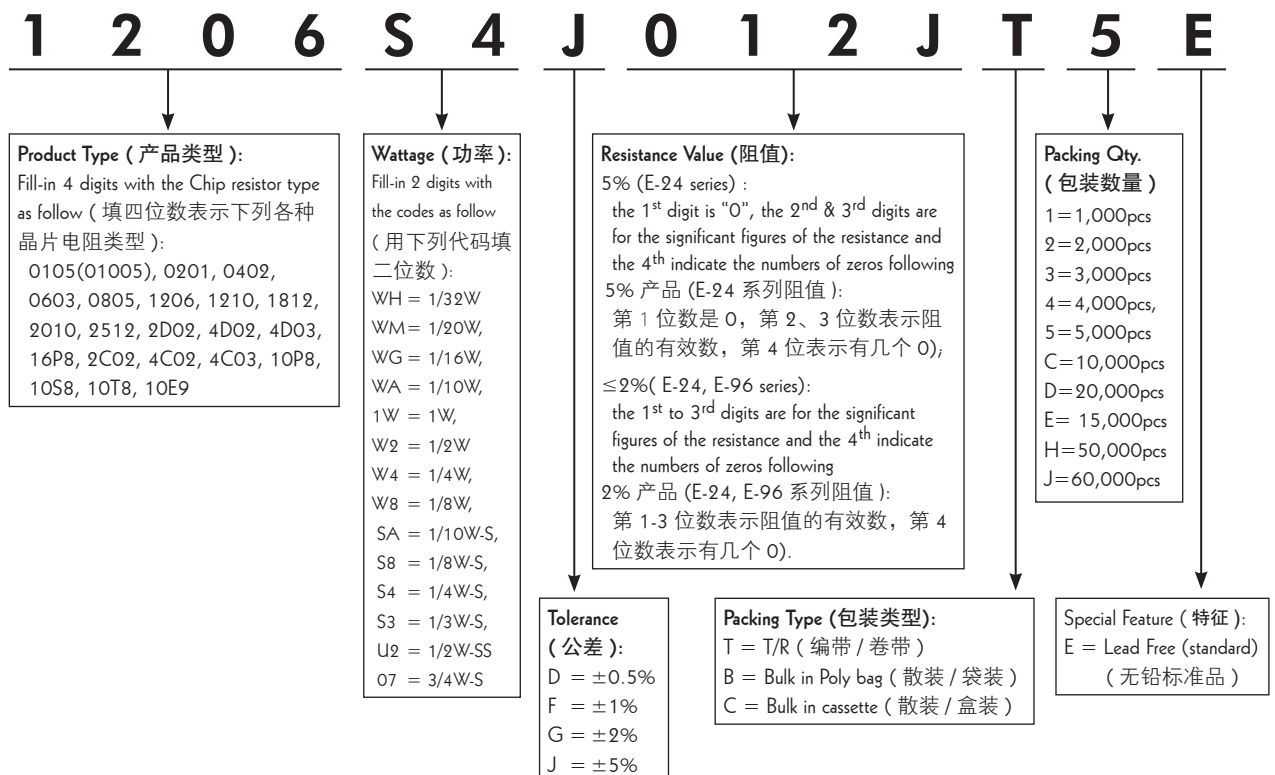
Performance Specifications (性能)

Temperature coefficient	温度系数	01005:	1Ω~10Ω: $\leq \pm 600\text{PPM}/^\circ\text{C}$ 10Ω~100Ω: $\leq \pm 400\text{PPM}/^\circ\text{C}$ >100Ω: $\leq \pm 250\text{PPM}/^\circ\text{C}$
		0402, 0603, 0805, 1206, 1210, 2010, 2512:	0.1Ω~0.99Ω: $\leq \pm 800\text{PPM}/^\circ\text{C}$ 1Ω~10Ω: $\leq \pm 400\text{PPM}/^\circ\text{C}$ 11Ω~100Ω: $\leq \pm 200\text{PPM}/^\circ\text{C}$ >100Ω: $\leq \pm 100\text{PPM}/^\circ\text{C}$ (0201 > 100Ω: $\leq \pm 200\text{PPM}/^\circ\text{C}$)
		Provided Specially (特别提供):	0603: 1Ω~10Ω: $\leq \pm 200\text{PPM}/^\circ\text{C}$ 0805, 1206: 1Ω~10Ω: $\leq \pm 100\text{PPM}/^\circ\text{C}$
Short-time overload	短时间过负荷	±5%, ±2%:	±(2.0% + 0.1Ω) Max(最大).
		±1%, ±0.5%:	±(1.0% + 0.1Ω) Max(最大).
Insulation resistance	绝缘电阻		$\geq 1,000\text{ M}\Omega$
Dielectric withstanding voltage	绝缘耐压		No evidence of flashover, mechanical damage, arcing or insulation breakdown 无击穿, 飞弧及可见机械性损伤
Terminal bending	端子弯曲		±(1.0% + 0.05Ω) Max(最大).
Soldering heat	耐焊接热		±(1.0% + 0.05Ω) Max(最大).
Solderability	可焊性		Min. 95% coverage (最少 95% 覆盖率)
Temperature cycling	温度循环	±5%, ±2%:	±(1.0% + 0.05Ω) Max(最大).
		±1%, ±0.5%:	±(0.5% + 0.05Ω) Max(最大).
Humidity (Steady State)	恒定湿热	±5%, ±2%:	±(3.0% + 0.1Ω) Max(最大).
		±1%, ±0.5%:	±(0.5% + 0.1Ω) Max(最大).
Load life in humidity	湿度寿命	±5%, ±2%:	±(3.0% + 0.1Ω) Max(最大).
		±1%, ±0.5%:	±(1.0% + 0.1Ω) Max(最大).
Load life	负载寿命	±5%, ±2%:	±(3.0% + 0.1Ω) Max(最大).
		±1%, ±0.5%:	±(1.0% + 0.1Ω) Max(最大).

- The values which are not of standard E-24 series (2% & 5%) and not of E-96 series (1%) could be offered on a case to case basis.
阻值如不在 E-24 系列 (2% & 5%) 及 E-96 系列 (1%) 可特别提供

Ordering Procedure (Example: 1206 1/4W-S 5% 1.2 Ω T/R-5000)

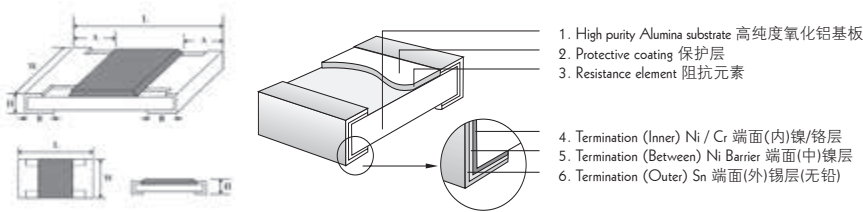
订购方式 (例如: 1206 1/4W-S 5% 1.2 Ω T/R-5000)



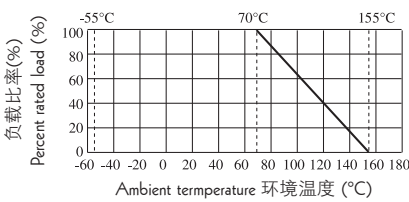
Feature (特性)

- High Resistance 高阻值
- Suitable for reflow & wave soldering
适合波峰焊与回流焊
- Application AV adapters, LCD back-light
camera strobe etc. 适用于AV适配器, LCD
背光电路, 照相机快门等.

Figures (型状)



Derating Curve & Specification (降功率曲线及性能)



Type 类型	Max Working Voltage 最大工作电压	Max Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压	Operating Temperature Range 工作温度范围
0603	75V	150V	300V	-55~+155°C
0805	150V	300V	500V	
1206	200V	400V	500V	
1210	200V	400V	500V	

Type 类型	Power (功率) (70°C)	L (mm)	W (mm)	H (mm)	A (mm)	B (mm)	Resistance Range (阻值范围) 5% (E24)
0603	1/16W 1/10W-S	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	10M~100M
0805	1/10W 1/8W-S	2.00±0.15	1.25 ^{+0.15} _{-0.10}	0.55±0.10	0.40±0.20	0.40±0.20	
1206	1/8W 1/4W-S	3.10±0.15	1.55 ^{+0.15} _{-0.10}	0.55±0.10	0.45±0.20	0.45±0.20	
1210	1/4W 1/2W-SS	3.10±0.10	2.60±0.20	0.55±0.10	0.50±0.25	0.50±0.20	

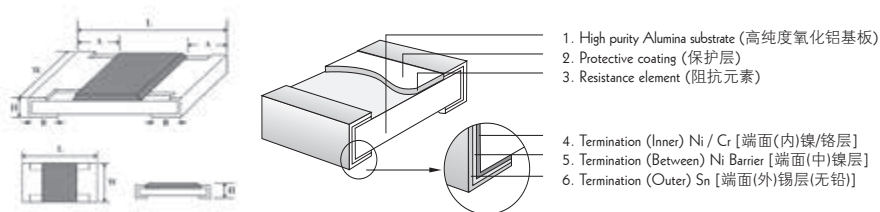
Performance Specification (性能)

Temperature coefficient	温度系数	≤±200ppm/°C
Short time overload	短时间过负荷	±(2.0%+0.1Ω) Max (最大)
Terminal bending	端子弯曲	±(1.0%+0.05Ω)
Solderability	可焊性	Min 95% coverage (最少 95% 覆盖率)
Dielectric withstanding voltage	绝缘耐压	No evidence of flashover, mechanical damage, arcing or insulation breakdown (无击穿, 飞弧及可见机械性损伤)
Soldering heat	耐焊接热	±(1.0%+0.05Ω) Max (最大)
Temperature cycling	温度循环	±(1.0%+0.05Ω) Max (最大)
Load Life in humidity	湿度寿命	±(3.0%+0.1Ω) Max (最大)
Load life	负载寿命	±(3.0%+0.1Ω) Max (最大)
Humidity (steady state)	恒定湿热	±(3.0%+0.1Ω) Max (最大)
Insulation resistance	绝缘电阻	≥1,000 MΩ

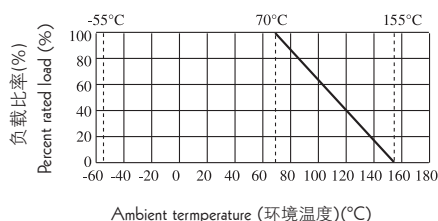
Feature (特性)

- Superior Anti-Surge Voltage performance.
优越的抗浪涌电压特性
- Suitable for both wave & re-flow soldering
适合波峰焊与回流焊
- Application AV adapters, LCD back-light camera
strobe etc. 适用于AV适配器、LCD背光电路、
照相机的快门等

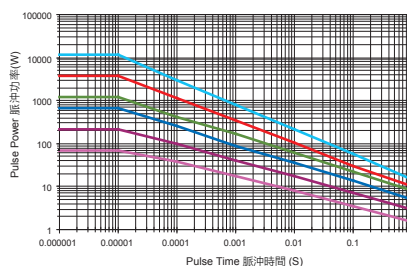
Figures (型状)



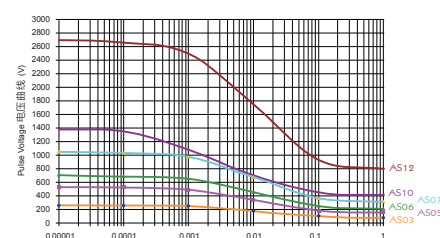
Derating Curve (降功率曲线)



Curve of Pulse Duration (脉冲曲线)



Pulse Voltage Limit (电压曲线)



Specification (规格)

Type 类型	Max. Working Voltage 最大工作电压	Max. Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压	Operating Temperature 工作温度范围
AS03	50V	100V	300V	-55~+155°C
AS05	150V	300V	500V	
AS06	200V	400V	500V	
AS07	200V	500V	500V	
AS10	400V	800V	500V	
AS12	500V	1000V	500V	

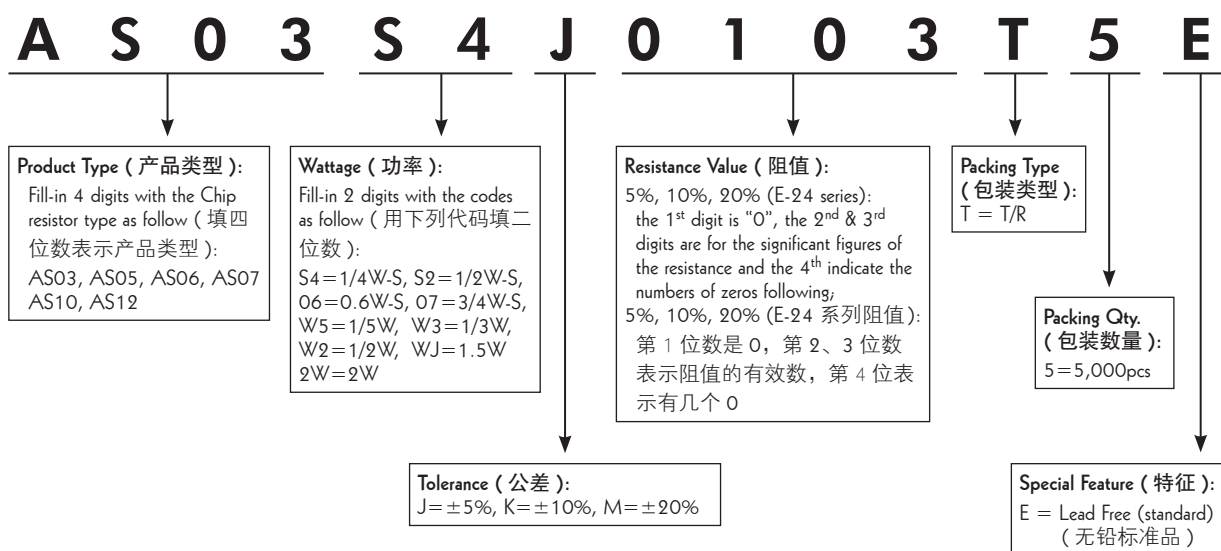
Type 类型	Power (功率) (70°C)	L (mm)	W (mm)	H (mm)	A (mm)	B (mm)	Resistance Range 阻值范围	Tolerance 公差
AS03	1/5W, 1/4W-S	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	1Ω~10M	±5% ±10% ±20%
AS05	1/3W, 1/2W-S	2.00±0.15	1.25 ^{+0.15} _{-0.10}	0.55±0.10	0.40±0.20	0.40±0.20		
AS06	1/2W, 0.6W-S	3.10±0.15	1.55 ^{+0.15} _{-0.10}	0.55±0.10	0.45±0.20	0.45±0.20		
AS07	1/2W, 3/4W-S	3.10±0.10	2.60±0.20	0.55±0.10	0.50±0.25	0.50±0.20		
AS10	1.5W	5.00±0.10	2.50±0.20	0.55±0.10	0.60±0.25	0.50±0.20		
AS12	2W	6.35±0.10	3.20±0.20	0.55±0.10	0.60±0.25	1.80±0.25		

Performance Specifications (性能)

Temperature coefficient	温度系数	1Ω~10Ω: $\pm 400\text{PPM}/^{\circ}\text{C}$ 11Ω~10M: $\pm 100\text{PPM}/^{\circ}\text{C}$
Short-time overload	短时间过负荷	$\pm(1.0\%+0.1\Omega)$ Max (最大)
Terminal bending	端子弯曲	$\pm(1.0\%+0.05\Omega)$ Max (最大)
Solderability	可焊性	Min 95% coverage (最少 95% 覆盖率)
Dielectric withstanding voltage	绝缘耐压	No evidence of flashover, mechanical damage, arcing or insulation breakdown 无击穿, 飞弧及可见机械性损伤
Soldering heat	耐焊接热	$\pm(1.0\%+0.05\Omega)$ Max (最大)
Temperature cycling	温度循环	$\pm(1.0\%+0.05\Omega)$ Max (最大)
Load Life in humidity	湿度寿命	$\pm(3.0\%+0.1\Omega)$ Max (最大)
Load life	负载寿命	$\pm(3.0\%+0.1\Omega)$ Max (最大)
Humidity (Steady State)	恒定湿热	$\pm(3.0\%+0.1\Omega)$ Max (最大)
Single pulse	单脉冲	$\pm(1.0\%+0.1\Omega)$ Max (最大)

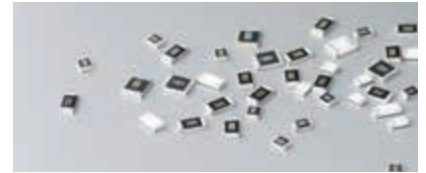
Ordering Procedure (Example: Anti-surge AS03 1/4WS 5% 10KΩ T/R-5000)

订购方式 (例如: 抗浪涌 AS03 1/4WS 5% 10KΩ T/R-5000)

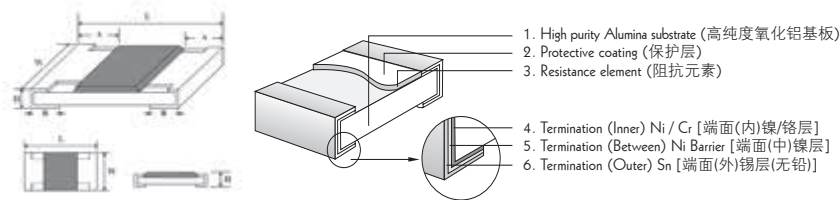


Feature (特性)

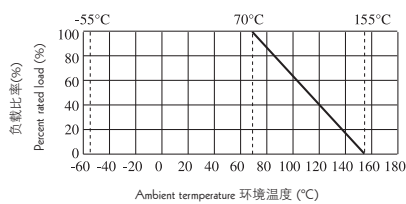
- High-Precision, high-power, anti-pulse 高精度、高功率、抗脉冲
- Suitable for reflow & wave soldering 适合波峰焊与回流焊
- Application monitors, power supplies, DVD, camcorder, laptop computer
适用于显示器、电源、DVD 摄像机、手提电脑



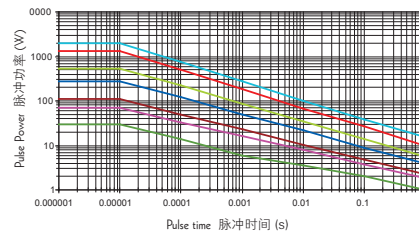
Figures (型状)



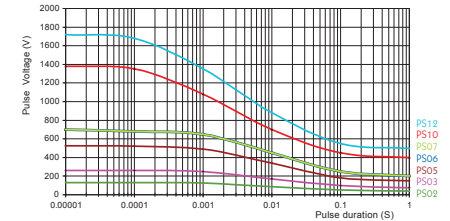
Derating Curve (降功率曲线)



Curve of Pulse Duration (脉冲曲线)



Pulse Voltage Limit (电压曲线)



Specification (性能)

Type 类型	Max working voltage 最大工作电压	Max Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压	Operating Temperature 工作温度范围
PS02	50V	100V	100V	-55~+155°C
PS03	50V	100V	300V	
PS05	150V	300V	500V	
PS06	200V	400V	500V	
PS07	200V	500V	500V	
PS10	400V	800V	500V	
PS12	500V	1000V	500V	

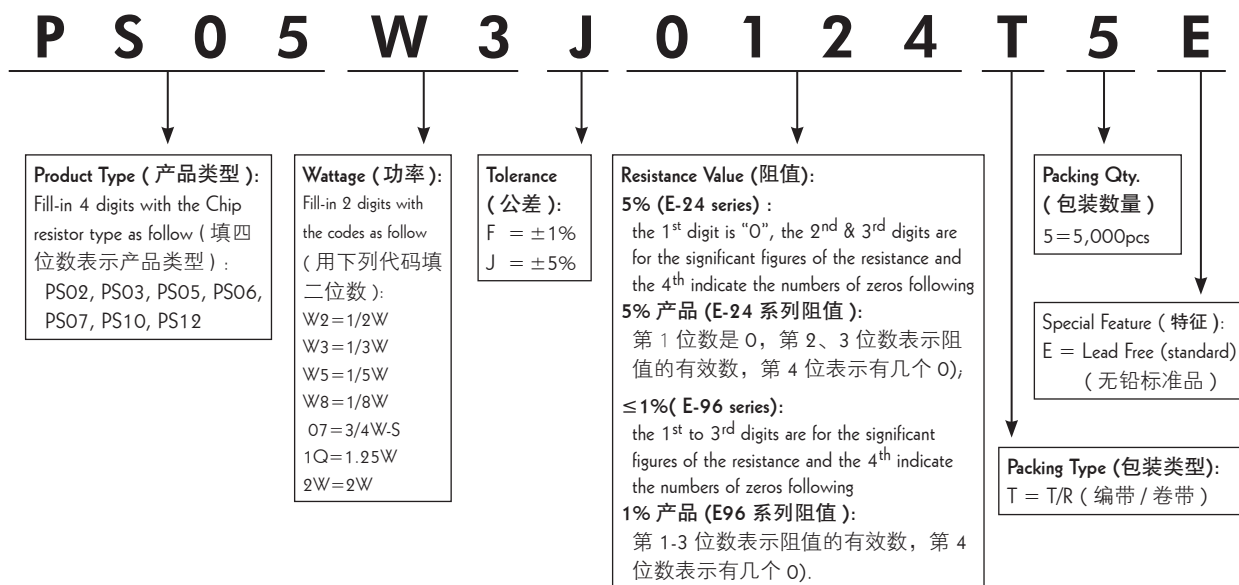
Type 类型	Power 功率 (70°C)	L (mm)	W (mm)	H (mm)	A (mm)	B (mm)	Resistance Range 阻值范围 1%(E96), 5%(E24)
PS02	1/8W	1.00±0.10	0.50±0.05	0.35±0.05	0.20±0.10	0.25±0.10	1Ω~10M
PS03	1/4W	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	
PS05	1/3W	2.00±0.15	1.25 ^{+0.15} _{-0.10}	0.55±0.10	0.40±0.20	0.40±0.20	
PS06	1/2W	3.10±0.15	1.55 ^{+0.15} _{-0.10}	0.55±0.10	0.45±0.20	0.45±0.20	
PS07	3/4W-S	3.10±0.10	2.60±0.20	0.55±0.10	0.55±0.25	0.50±0.20	
PS10	1.25W	5.00±0.10	2.50±0.20	0.55±0.10	0.60±0.25	0.50±0.20	
PS12	2W	6.35±0.10	3.20±0.20	0.55±0.10	0.60±0.25	1.80±0.25	

Performance Specification (性能)

Temperature coefficient	温度系数	PS02, PS03, PS05, PS06 PS10, PS12: $\leq 10\Omega$: $\leq \pm 200\text{ppm}/^\circ\text{C}$ $> 10\Omega$: $\leq \pm 100\text{ppm}/^\circ\text{C}$ PS07: $\leq \pm 100\text{ppm}/^\circ\text{C}$
Short-time overload	短时间过负荷	$\pm 1\%: \pm (1.0\% + 0.1\Omega)\text{Max. (最大)}$ $\pm 5\%: \pm (2.0\% + 0.1\Omega)\text{Max. (最大)}$
Terminal bending	端子弯曲	$\pm (1.0\% + 0.05\Omega)\text{Max. (最大)}$
Solderability	可焊性	Min. 95% Coverage (最少 95% 覆盖率)
Soldering heat	耐焊接热	$\pm (1.0\% + 0.05\Omega)\text{Max. (最大)}$
Load life in humidity	湿度寿命	$\pm 1\%: \pm (1.0\% + 0.1\Omega)\text{Max. (最大)}$ $\pm 5\%: \pm (3.0\% + 0.1\Omega)\text{Max. (最大)}$
Dielectric withstanding voltage	绝缘耐压	No evidence of flashover, mechanical damage, arcing or insulation breakdown 无击穿, 飞弧及可见机械性损伤
Temperature Cycling	温度循环	$\pm 1\%: \pm (0.5\% + 0.1\Omega)\text{Max. (最大)}$ $\pm 5\%: \pm (3.0\% + 0.1\Omega)\text{Max. (最大)}$
Load life	负载寿命	$\pm 1\%: \pm (1.0\% + 0.1\Omega)\text{Max. (最大)}$ $\pm 5\%: \pm (3.0\% + 0.1\Omega)\text{Max. (最大)}$
Single pulse	单脉冲	$\pm (1.0\% + 0.1\Omega)\text{Max. (最大)}$

Ordering Procedure (Example: PS05 1/3W 5% 120K Ω T/R-5000)

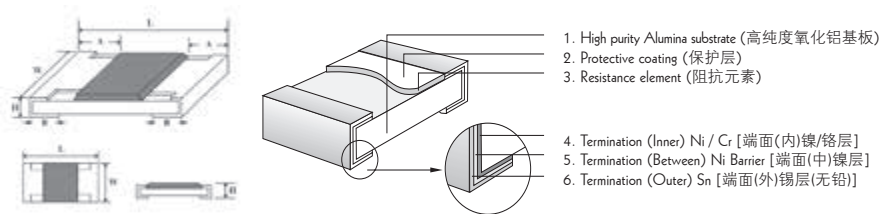
订购方式 (例如: PS05 1/3W 5% 120K Ω T/R-5000)



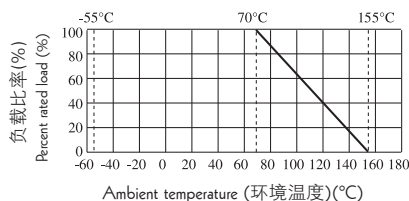
Feature (特性)

- High power in standard size
标准尺寸，高功率
- Suitable for both wave & re-flow soldering
适合波峰焊与回流焊
- Application: AV adapters, LCD back-light, camera strobe etc. 适用于AV适配器, LCD 背光电路, 照相机快门等

Figures (型状)



Derating Curve & Specification (降功率曲线及性能)



Type 类型	L(mm)	W(mm)	H(mm)	A(mm)	B(mm)
HP02 (0402)	1.00±0.10	0.50 ^{+0.05} _{-0.05}	0.35±0.05	0.20±0.10	0.25±0.10
HP03 (0603)	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20
HP05 (0805)	2.00±0.15	1.25 ^{+0.15} _{-0.10}	0.55±0.10	0.40±0.20	0.40±0.20
HP06 (1206)	3.10±0.15	1.55 ^{+0.15} _{-0.10}	0.55±0.10	0.45±0.20	0.45±0.20
HP07 (1210)	3.10±0.10	2.60±0.20	0.55±0.10	0.50±0.25	0.50±0.20
HP10 (2010)	5.00±0.10	2.50±0.20	0.55±0.10	0.60±0.25	0.50±0.20
HP11 (1812)	4.50±0.20	3.20±0.20	0.55±0.20	0.50±0.20	0.50±0.20
HP12 (2512)	6.35±0.10	3.20±0.20	0.55±0.10	0.60±0.25	1.80±0.25

Type 类型	Power Rating at 70°C 功率	Resistance Range of 1% & 5% 1% & 5% 的阻值范围	Max. Working Voltage 最大工作电压	Max. Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压	Operating Temperature 工作温度范围
HP02 (0402)	1/10W	1Ω~10M 0Ω	50V	100V R _{max} =10mΩ, I _{max} =3A	100V	-55°C~155°C
HP03 (0603)	1/5W	1Ω~10M 0Ω	50V	100V R _{max} =8mΩ, I _{max} =5A	300V	-55°C~155°C
HP05 (0805)	1/3W	1Ω~10M 0Ω	150V	300V R _{max} =5mΩ, I _{max} =6A	500V	-55°C~155°C
HP06 (1206)	1/2W	1Ω~10M 0Ω	200V	400V R _{max} =5mΩ, I _{max} =10A	500V	-55°C~155°C
HP07 (1210)	3/4W	1Ω~10M 0Ω	200V	500V R _{max} =4mΩ, I _{max} =12A	500V	-55°C~155°C
HP10 (2010)	1W	1Ω~10M 0Ω	200V	500V R _{max} =5mΩ, I _{max} =12A	500V	-55°C~155°C
HP11 (1812)	1.25W	1Ω~10M 0Ω	200V	500V R _{max} =5mΩ, I _{max} =12A	500V	-55°C~155°C
HP12 (2512)	2W	1Ω~10M 0Ω	250V	500V R _{max} =5mΩ, I _{max} =16A	500V	-55°C~155°C

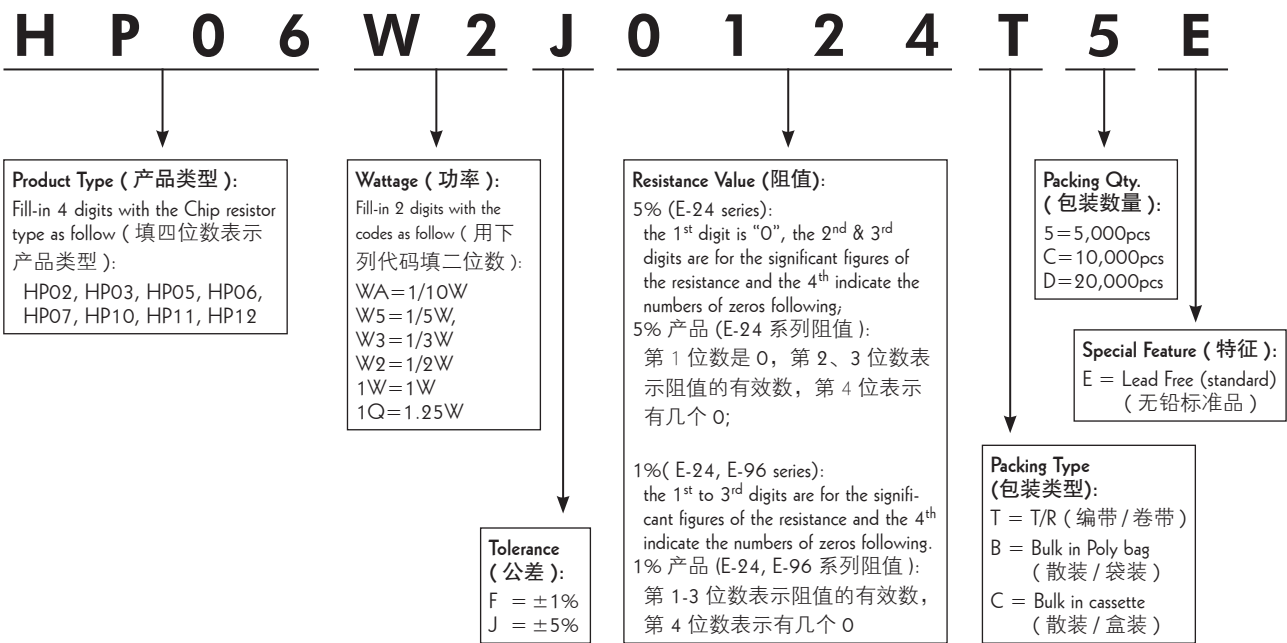
Performance Specifications (性能)

Temperature coefficient	温度系数	$\leq \pm 100\text{PPM}/^{\circ}\text{C}$
Short-time overload	短时间过负荷	$\pm 5\%: \pm (2.0\% + 0.1\Omega)$ Max.(最大) $\pm 1\%: \pm (1.0\% + 0.1\Omega)$ Max.(最大)
Dielectric withstanding voltage	绝缘耐压	No Evidence of flashover, mechanical damage, arcing or insulation breakdown 无击穿, 飞弧及可见机械性损伤
Terminal bending	端子弯曲	$\pm (1.0\% + 0.05\Omega)$ Max.(最大)
Soldering heat	耐焊接热	$\pm (1.0\% + 0.05\Omega)$ Max.(最大)
Solderability	可焊性	Min. 95% Coverage (最少 95% 覆盖率)
Temperature cycling	温度循环	$\pm 5\%: \pm (1.0\% + 0.05\Omega)$ Max.(最大) $\pm 1\%: \pm (0.5\% + 0.05\Omega)$ Max.(最大)
Humidity (Steady state)	恒定湿热	$\pm 5\%: \pm (3.0\% + 0.1\Omega)$ Max.(最大) $\pm 1\%: \pm (0.5\% + 0.1\Omega)$ Max.(最大)
Load life in humidity	湿度寿命	$\pm 5\%: \pm (3.0\% + 0.1\Omega)$ Max.(最大) $\pm 1\%: \pm (1.0\% + 0.1\Omega)$ Max.(最大)
Load life	负载寿命	$\pm 5\%: \pm (3.0\% + 0.1\Omega)$ Max.(最大) $\pm 1\%: \pm (1.0\% + 0.1\Omega)$ Max.(最大)

* HP02 TCR: 1 Ω ~10 Ω : $\pm 400\text{PPM}/^{\circ}\text{C}$ 11 Ω ~100 Ω : $\pm 200\text{PPM}/^{\circ}\text{C}$ >100 Ω : $\pm 100\text{PPM}/^{\circ}\text{C}$

Ordering Procedure (Example: High Power HP06 1/2W 5% 120K Ω T/R-5000)

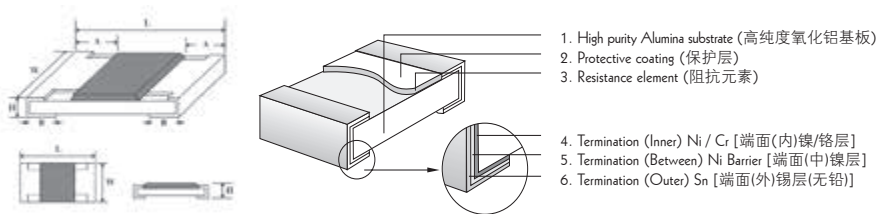
订购方式 (例如: 高功率 HP06 1/2W 5% 120K Ω T/R-5000)



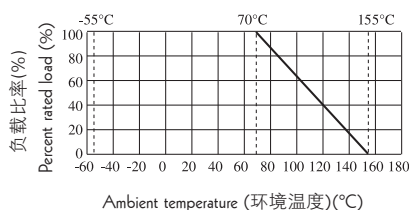
Feature (特性)

- Low Resistance High power
低阻值, 高功率
- Suitable for reflow & wave soldering
适合波峰焊与回流焊
- Application AV adapters, LCD back-light
camera strobe etc. 适用于AV适配器, LCD
背光电路, 照相机快门等

Figures (型状)



Derating Curve & Specification (降功率曲线及性能)



Type 类型	Max. Working Voltage 最大工作电压	Max. Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压	Operating Temperature 工作温度范围
HP03	50V	100V	300V	-55~+155°C
HP05	150V	300V	500V	
HP06	200V	400V	500V	
HP07	200V	500V	500V	
HP10	200V	500V	500V	
HP11	200V	500V	500V	
HP12	250V	500V	500V	

Type 类型	Power 功率 (70°C)	L (mm)	W (mm)	H (mm)	A (mm)	B (mm)	Resistance Range 阻值范围 1% & 5%
HP03	1/5W	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	0.1Ω~1Ω
HP05	1/3W	2.00±0.15	1.25 ^{+0.15} _{-0.10}	0.55±0.10	0.40±0.20	0.40±0.20	0.1Ω~1Ω
HP06	1/2W	3.10±0.15	1.55 ^{+0.15} _{-0.10}	0.55±0.10	0.45±0.20	0.45±0.20	50mΩ~1Ω
HP07	3/4W	3.10±0.10	2.60±0.20	0.55±0.10	0.50±0.25	0.50±0.20	0.1Ω~1Ω
HP10	1W	5.00±0.10	2.50±0.20	0.55±0.10	0.60±0.25	0.50±0.20	50mΩ~1Ω
HP11	1.25W	4.50±0.20	3.20±0.20	0.55±0.20	0.50±0.20	0.50±0.20	0.1Ω~1Ω
HP12	2W	6.35±0.10	3.20±0.20	0.55±0.10	0.60±0.25	1.80±0.25	50mΩ~1Ω

Performance Specification (性能)

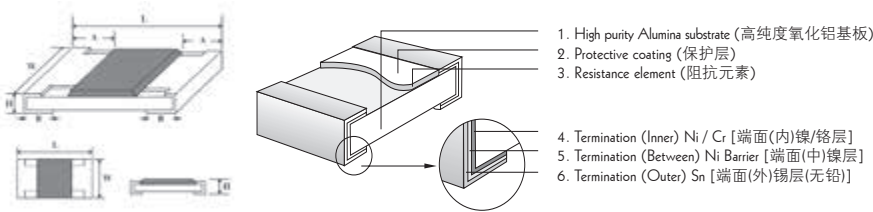
Temperature coefficient	温度系数	HP03: 0.1Ω~0.2Ω: ≤±200ppm/°C 0.2Ω~1Ω: ≤±100 ppm/°C HP05, HP07, HP10, HP11: ≤±100 ppm/°C HP06: 50mΩ~0.1Ω: ≤±150 ppm/°C 0.1Ω~1Ω: ≤±100 ppm/°C HP12: ≤±75 ppm/°C
Short time overload	短时间过负荷	1%: ±(1.0%+0.1Ω) Max (最大) 5%: ±(2.0%+0.1Ω) Max (最大)
Terminal bending	端子弯曲	±(1.0%+0.05Ω)
Solderability	可焊性	≥95% coverage (最少 95% 覆盖率)
Dielectric withstanding voltage	绝缘耐压	No evidence of flashover, mechanical damage, arcing or insulation breakdown 无击穿, 飞弧及可见机械性损伤
Soldering heat	耐焊接热	±(1.0%+0.05Ω) Max (最大)
Temperature cycling	温度循环	1%: ±(0.5%+0.05Ω) Max (最大) 5%: ±(1.0%+0.05Ω) Max (最大)
Load Life in humidity	湿度寿命	1%: ±(1.0%+0.1Ω) Max (最大) 5%: ±(3.0%+0.1Ω) Max (最大)
Load life	负载寿命	1%: ±(1.0%+0.1Ω) Max (最大) 5%: ±(3.0%+0.1Ω) Max (最大)
Humidity (Steady State)	恒定湿热	1%: ±(0.5%+0.1Ω) Max (最大) 5%: ±(3.0%+0.1Ω) Max (最大)

• HP10, HP12 T.C.R ±75ppm/°C could be provided specially (*HP10, HP12 T.C.R ±75ppm/°C 可特别提供)

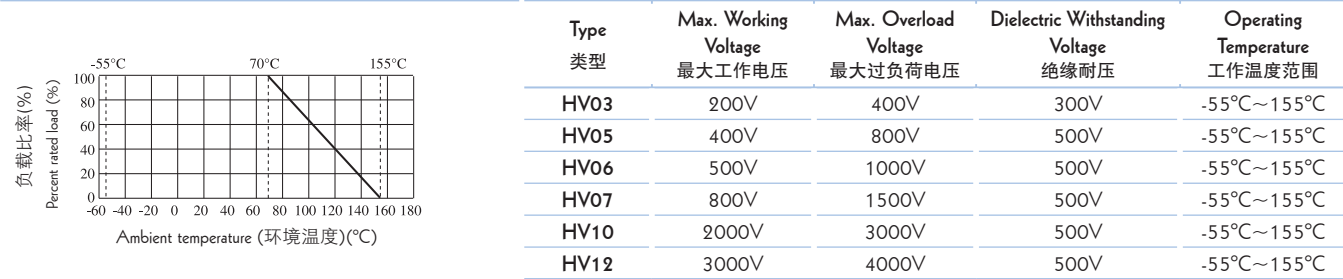
Feature (特性)

- Superior to Thick Film Chip Resistors in Max. Working Voltage 在最大工作电压上优于普通厚膜晶片电阻
- Suitable for both wave & re-flow soldering 适合波峰焊及回流焊
- Application: AV adapter, LCD Backlight, Flash Light of camera 适用于AV适配器、LCD背光电路、照相机的闪光灯等

Figures (型状)



Derating Curve & Specification (降功率曲线及性能)



Type 类型	Power Rating 功率 at 70°C	L(mm)	W(mm)	H(mm)	A(mm)	B(mm)	Resistance Range 阻值范围 1% & 5%
HV03	1/16W, 1/10W-S	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30± 0.20	36KΩ~10MΩ
HV05	1/10W, 1/8W-S	2.00±0.15	1.25 ^{+0.15} _{-0.10}	0.55±0.10	0.40±0.20	0.40± 0.20	100KΩ~10MΩ
HV06	1/8W, 1/4W-S	3.10±0.15	1.55 ^{+0.15} _{-0.10}	0.55±0.10	0.45±0.20	0.45±0.20	100KΩ~10MΩ
HV07	1/3W-S, 1/2W-SS	3.10±0.10	2.60±0.20	0.55±0.10	0.50±0.25	0.50±0.20	50KΩ~10MΩ
HV10	1/2W, 3/4W-S	5.00±0.10	2.50±0.20	0.55±0.10	0.60±0.25	0.50±0.20	50KΩ~10MΩ
HV12	1W	6.35±0.10	3.20±0.20	0.55±0.10	0.60±0.25	0.50±0.20	39KΩ~10MΩ

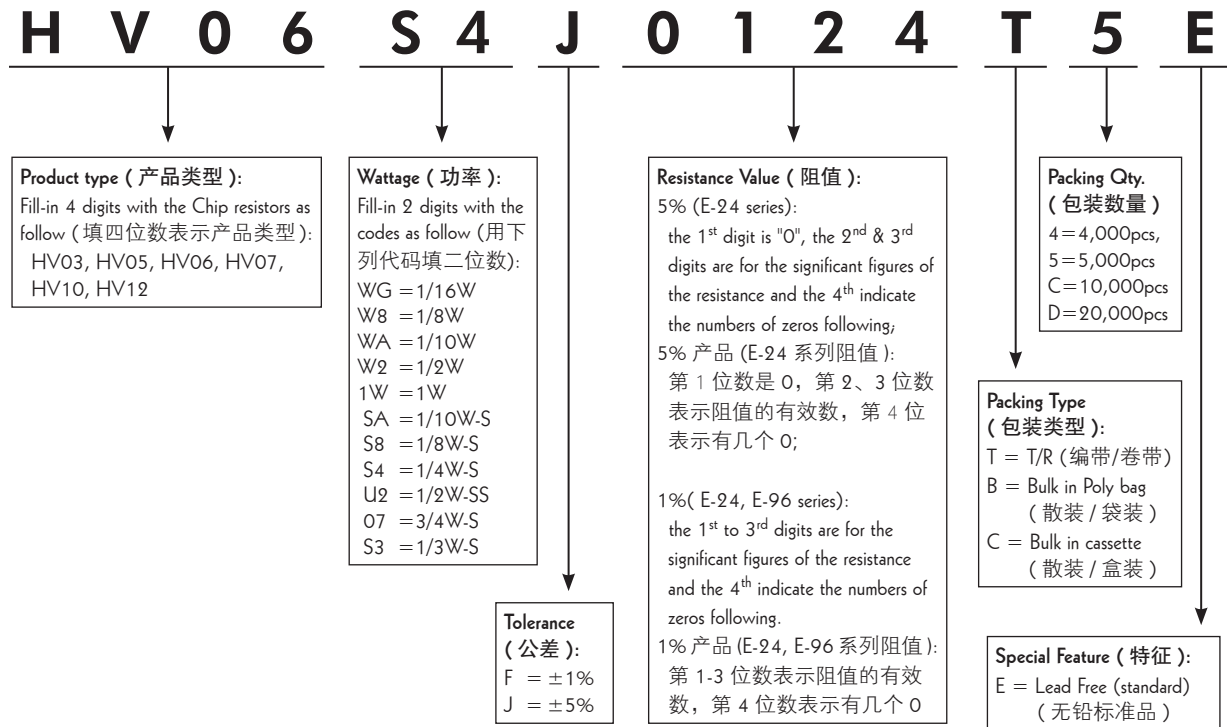
The non-standard value can be offered on a case to case basis. 特殊规格可特别提供

Performance Specification (性能)

Temperature coefficient	温度系数	≤±100PPM/°C
Short-time overload	短时间过负荷	±(2.0%+0.1Ω) Max.(最大)
Terminal bending	端子弯曲	±(1.0%+0.05Ω) Max.(最大)
Solderability	可焊性	Min. 95% Coverage (最少 95% 覆盖率)
Temperature Cycling	温度循环	5% : ±(1.0%+0.05Ω) Max.(最大) 1%: ±(0.5%+0.05Ω) Max.(最大)
Humidity (Steady State)	恒定湿热	±(3.0%+0.1Ω) Max.(最大)
Load life in humidity	湿度寿命	±(3.0%+0.1Ω) Max.(最大)
Load life	负载寿命	±(3.0%+0.1Ω) Max.(最大)
Insulation resistance	绝缘电阻	≥1,000MΩ
Dielectric withstanding voltage	绝缘耐压	No evidence of flashover, mechanical damage, arcing or insulation breakdown 无击穿, 飞弧及可见机械性损伤
Soldering heat	耐焊接热	±(1.0% + 0.05Ω) Max.(最大)

Ordering Procedure (Example: High Voltage HV06 1/4WS 5% 120KΩ T/R-5000)

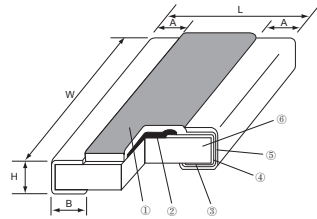
订购方式 (例如: 高压 HV06 1/4W-S 5% 120KΩ T/R-5000)



Feature (特性)

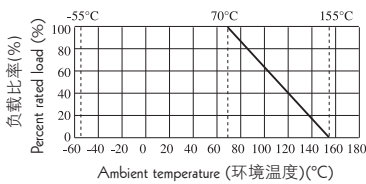
- High power & Wide terminal
高功率，宽电极
- Suitable for both wave & re-flow soldering
适合波峰焊及回流焊
- Application: AV adapters, LCD back-light, camera strobe etc. 适用于AV适配器, LCD 背光电路, 照相机快门等

Figures (型状)



1. Protective layer (保护层)
2. Resistive element (阻抗元素)
3. Termination (Inner) Ni / Cr [端面(内)镍/铬层]
4. Termination (Between) Ni [端面(中)镍层]
5. Termination (Outer) Sn [端面(外)锡层(无铅)]
6. High purity Alumina substrate (高纯度氧化铝基板)

Derating Curve & Specification (降功率曲线及性能)



Type 类型	Max. Working Voltage 最大工作电压	Max. Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压	Resistance Value of Jumper 零欧姆电阻阻值	Rated Current of Jumper 零欧姆电阻额定电流	Max. Overload Current of Jumper 零欧姆电阻最大过负荷电流	Operating Temperature 工作温度范围
0508	150V	300V	500V	<50mΩ	4A	8A	-55°C~155°C
0612	200V	400V	500V	<50mΩ	5A	10A	
1020	200V	400V	500V	<50mΩ	6A	12A	
1218	200V	400V	500V	<50mΩ	6A	10A	
1225	200V	400V	500V	<50mΩ	6A	15A	

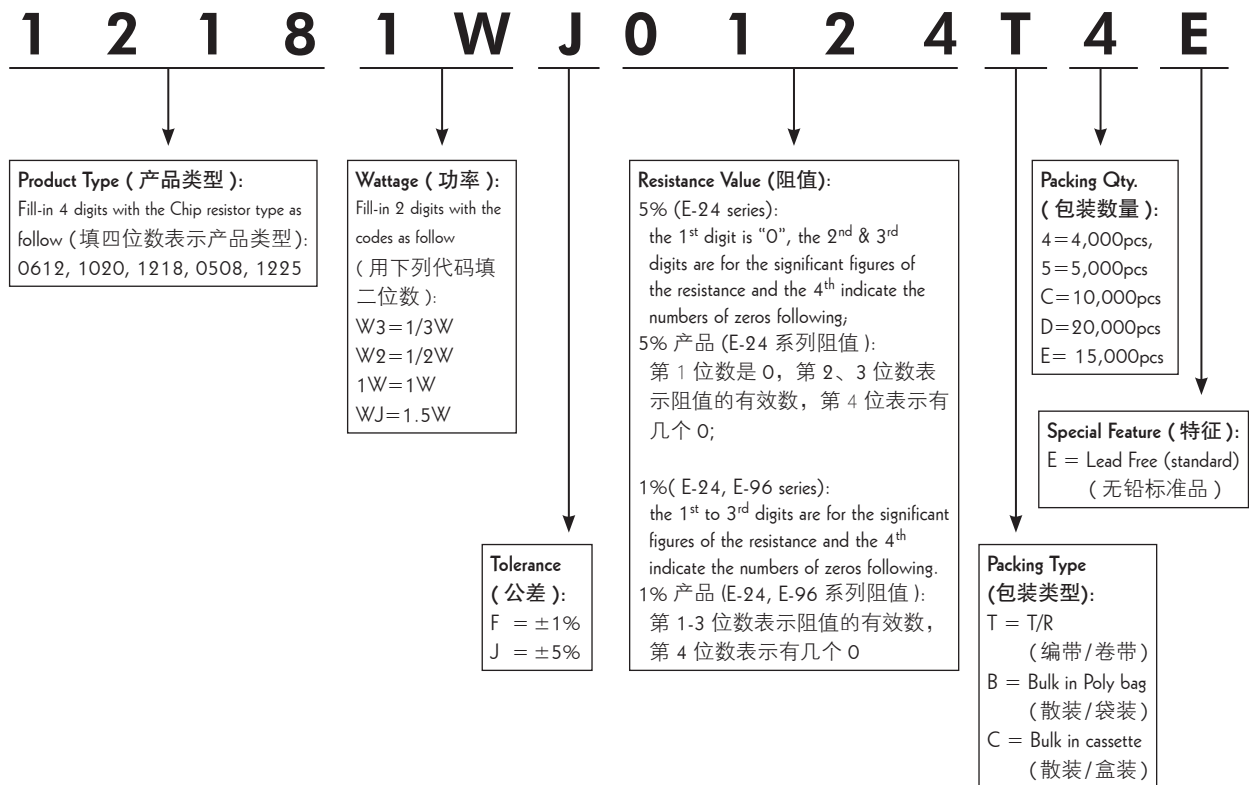
Type 类型	Power Rating 功率 at 70°C	L(mm)	W(mm)	H(mm)	A(mm)	B(mm)	Resistance Range 阻值范围 1%	Resistance Range 阻值范围 5%
0508	1/3W	1.20±0.10	2.00±0.10	0.55±0.10	0.20±0.10	0.30±0.20	10Ω~1M	10Ω~1M
0612	1/2W	1.60±0.15	3.20±0.15	0.55±0.10	0.30±0.20	0.45±0.20	10Ω~1M	1Ω~1M
1020	1W	2.50±0.15	5.00±0.15	0.55±0.10	0.40±0.20	0.60±0.20	10Ω~1M	1Ω~1M
1218	1W	3.10±0.10	4.60±0.15	0.55±0.10	0.45±0.20	0.40±0.20	0.1Ω~1M	0.1Ω~1M
1225	1.5W	3.10±0.15	6.25±0.15	0.55±0.10	0.45±0.20	0.65±0.20	1Ω~1M	1Ω~1M

Performance Specification (性能)

Temperature coefficient 温度系数	0.1Ω~0.99Ω: ≤ ±800 PPM/°C 1Ω~10Ω: ≤ ±400 PPM/°C 11Ω~100Ω: ≤ ±200 PPM/°C >100Ω: ≤ ±100 PPM/°C
Short-time overload 短时间过负荷	±5%: ±(2.0% + 0.1Ω) Max. (最大) ±1%: ±(1.0% + 0.1Ω) Max. (最大)
Dielectric withstanding Voltage 绝缘耐压	No evidence of flashover, mechanical damage, arcing or insulation breakdown 无击穿, 飞弧及可见机械性损伤
Terminal bending 端子弯曲	±(1.0% + 0.05Ω) Max. (最大)
Soldering heat 耐焊接热	±(1.0% + 0.05Ω) Max. (最大)
Solderability 可焊性	Min. 95% coverage (最少 95% 覆盖率)
Temperature cycling 温度循环	±5%: ±(1.0% + 0.05Ω) Max. (最大) ±1%: ±(0.5% + 0.05Ω) Max. (最大)
Humidity (Steady State) 恒定湿热	±5%: ±(3.0% + 0.1Ω) Max. (最大) ±1%: ±(0.5% + 0.1Ω) Max. (最大)
Load life in humidity 湿度寿命	±5%: ±(3.0% + 0.1Ω) Max. (最大) ±1%: ±(1.0% + 0.1Ω) Max. (最大)
Load life 负载寿命	±5%: ±(3.0% + 0.1Ω) Max. (最大) ±1%: ±(1.0% + 0.1Ω) Max. (最大)

Ordering Procedure (Example: Wide Terminal 1218 1W 5% 120KΩ T/R-4000)

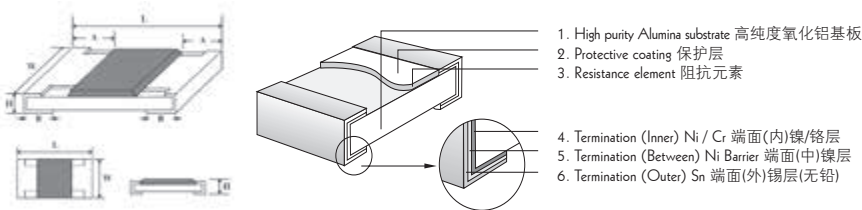
订购方式 (例如: 宽电极 1218 1W 5% 120KΩ T/R-4000)



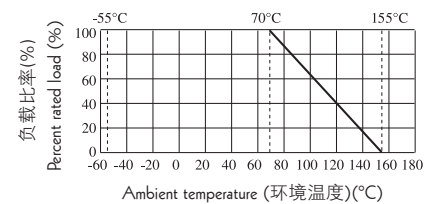
Feature (特性)

- Apply to stable circuit instead of regulating circuit to adjust the application of resistance (laser adjusting resistance machine in client end)
适用于稳定电路中，代替调节电路来调节阻值的应用(客户端激光调阻机)
- Superior heat & humidity withstanding performance
良好的耐温耐湿性

Figures (型状)



Derating Curve & Specification (降功率曲线及性能)



Type 类型	Max. Working Voltage 最大工作电压	Max. Overload Voltage 最大过负荷电压	Operating Temperature 工作温度范围
TR03	75V	150V	-55°C~155°C
TR05	150V	300V	-55°C~155°C
TR06	200V	400V	-55°C~155°C

Type 类型	Power Rating 功率 70°C	L(mm)	W(mm)	H(mm)	A(mm)	B(mm)	Tolerance 公差	Resistance Range 阻值范围 (E-12)
TR03	1/16W, 1/10W-S	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	R: 0~30% Q: 0~20% T: 0~10% S: -10~0% N: -20~0% P: -30~0% J: ±5% K: ±10% M: ±20%	1Ω~1M
TR05	1/10W, 1/8W-S	2.00±0.15	1.25 ^{+0.15} _{-0.10}	0.55±0.10	0.40±0.20	0.40±0.20		
TR06	1/8W, 1/4W-S	3.10±0.15	1.55 ^{+0.15} _{-0.10}	0.55±0.10	0.45±0.20	0.45±0.20		

Performance Specification (性能)

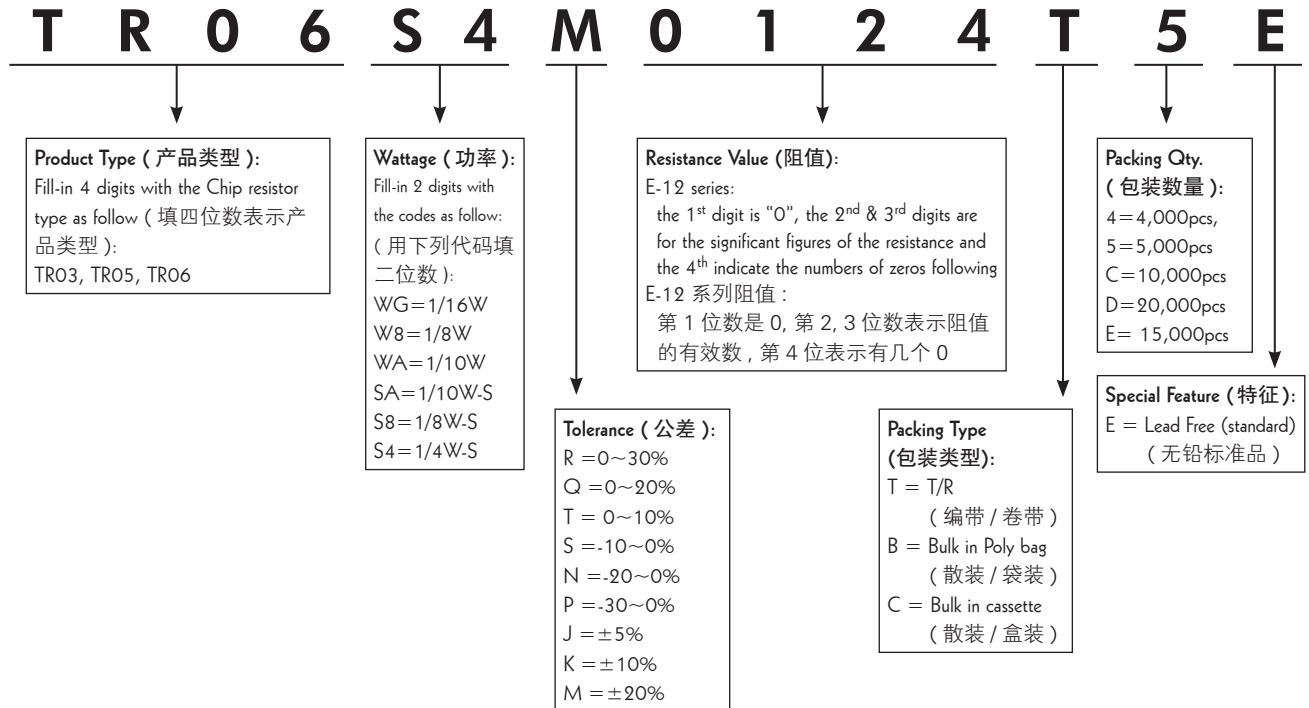
Temperatre coefficient	温度系数	TR03: 1Ω~10Ω: ≤±400PPM/°C >10Ω: ≤±200PPM/°C TR05, TR06: ±200PPM/°C
Short-time overload	短时间过负荷	±(2.0%+0.1Ω) Max.(最大)
Terminal bending	端子弯曲	±(1.0%+0.05Ω) Max.(最大)
Solderability	可焊性	Min. 95% coverage (最少 95% 覆盖率)
Soldering heat	耐焊接热	±(1.0%+0.05Ω) Max.(最大)
Temperature cycling	温度循环	±(1.0%+0.05Ω) Max.(最大)
Load life in humidity	湿度寿命	±(3.0%+0.1Ω) Max.(最大)
Load life	负载寿命	±(3.0%+0.1Ω) Max.(最大)

Ordering Procedure (Example: Trimable TR06 1/4W-S $\pm 20\%$ 120K Ω T/R-5000)

订购方式 (例如: 可调 TR06 1/4W-S $\pm 20\%$ 120K Ω T/R-5000)

The values which are not of standard E-12 series could be offered on a case to case basis.

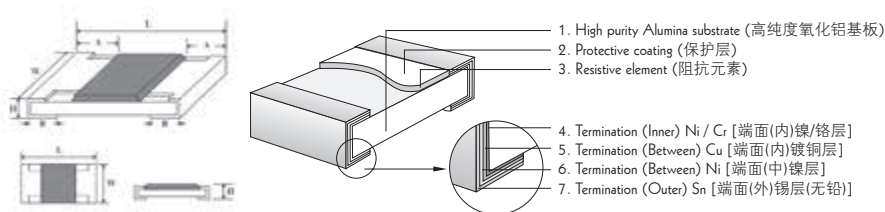
阻值如不在 E-12 系列的可特别提供。



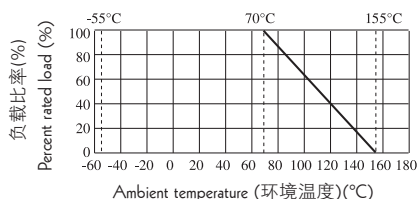
Feature (特性)

- Ultra-low Value
超低阻值
- Low Temperature Coefficient
低温度系数
- Suitable for reflow & wave soldering
适合波峰焊及回流焊
- Application: Power supply
应用于电源

Figures (型状)



Derating Curve & Specification (降功率曲线及性能)



Type 类型	Dielectric Withstanding Voltage 绝缘耐压	Operating Temperature 工作温度范围
CS02	100V	-55°C~155°C
CS03	300V	-55°C~155°C
CS05	500V	-55°C~155°C
CS06	500V	-55°C~155°C
CS07	500V	-55°C~155°C
CS10	500V	-55°C~155°C
CS11	500V	-55°C~155°C
CS12	500V	-55°C~155°C

Type 类型	Power Rating 功率 70°C	L(mm)	W(mm)	H(mm)	A(mm)	B(mm)	Resistance Range 阻值范围 1% & 5%	T.C.R. 温度系数 (PPM/°C)
CS02	1/10W 1/8W-S	1.00±0.10	0.50±0.05	0.35±0.05	0.20±0.10	0.25±0.10	50mΩ~1Ω	50mΩ~100mΩ: ≤±700 100mΩ~1Ω: ≤±200
CS03	1/10W 1/5W-S	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	20mΩ~1Ω	20mΩ~29.9mΩ: ≤±800 30mΩ~32.9mΩ: ≤±600 33mΩ~50mΩ: ≤±400 50.1mΩ~0.1Ω: ≤±300 0.11Ω~1Ω: ≤±200
CS05	1/8W 1/4W-S	2.00±0.15	1.25 ^{+0.15} _{-0.10}	0.55±0.10	0.40±0.20	0.40±0.20	10mΩ~1Ω	10mΩ~15mΩ: ≤±800 15.1mΩ~25mΩ: ≤±600 25.1mΩ~50mΩ: ≤±400 50.1mΩ~0.2Ω: ≤±200 0.21Ω~1Ω: ≤±100
CS06	1/4W 1/3W-S	3.10±0.15	1.55 ^{+0.15} _{-0.10}	0.55±0.10	0.45±0.20	0.45±0.20	10mΩ~1Ω	10mΩ~14.9mΩ: ≤±700 15mΩ~30mΩ: ≤±400 30.1mΩ~50mΩ: ≤±300 50.1mΩ~0.1Ω: ≤±200 0.11Ω~1Ω: ≤±150
CS07	1/3W 1/2W-S	3.10+/-0.10	2.60±0.20	0.55±0.10	0.50±0.25	0.50±0.20	10mΩ~1Ω	10mΩ~14.9mΩ: ≤±500 15mΩ~19.9mΩ: ≤±400 20mΩ~50mΩ: ≤±300 50.1mΩ~1Ω: ≤±100
CS10	1/2W 3/4W-S	5.00±0.10	2.50±0.20	0.55±0.10	0.60±0.25	0.50±0.20	10mΩ~1Ω	10mΩ~14.9mΩ: ≤±600 15mΩ~19.9mΩ: ≤±500 20mΩ~30mΩ: ≤±300 30.1mΩ~50mΩ: ≤±200 50.1mΩ~0.1Ω: ≤±150 0.1Ω~1Ω: ≤±100
CS11	1/2W 3/4W-S	4.50±0.20	3.20±0.20	0.55±0.20	0.50±0.20	0.80±0.30	10mΩ~1Ω	10mΩ~19.9mΩ: ≤±500 20mΩ~49.9mΩ: ≤±400 50mΩ~0.1Ω: ≤±200 0.11Ω~1Ω: ≤±100
CS12	1W	6.35±0.10	3.20±0.20	0.55±0.10	0.60±0.25	0.80±0.30	10mΩ~1Ω	10mΩ~14.9mΩ: ≤±600 15mΩ~19.9mΩ: ≤±400 20mΩ~30mΩ: ≤±300 30.1mΩ~50mΩ: ≤±200 50.1mΩ~0.1Ω: ≤±150 0.1Ω~1Ω: ≤±100

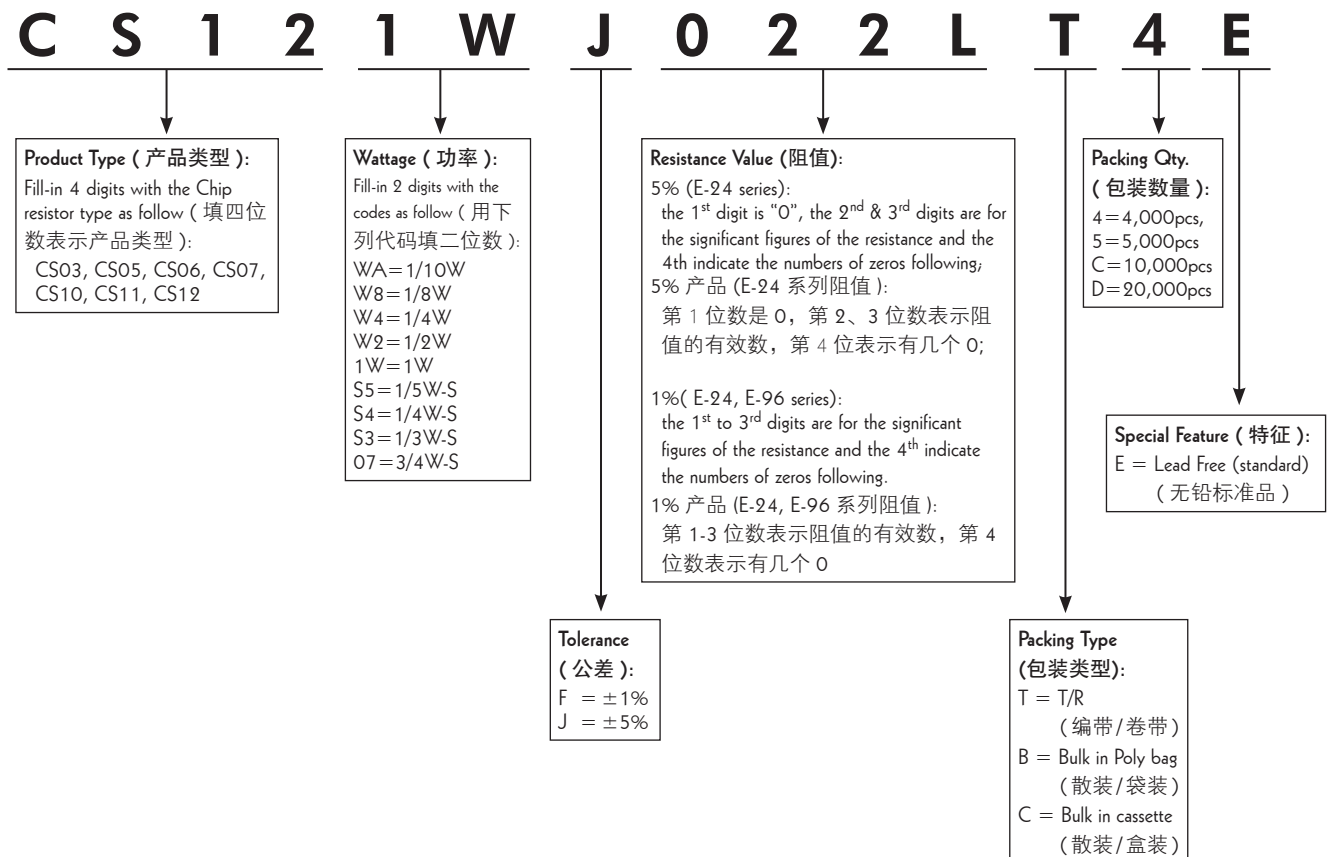
Performance Specifications (性能)

Short-time overload	短时间过负荷	1%: $\pm(1.0\%+0.005\Omega)$ Max. (最大) 5%: $\pm(2.0\%+0.005\Omega)$ Max. (最大)
Terminal bending	端子弯曲	$\pm(1.0\%+0.005\Omega)$ Max. (最大)
Solderability	可焊性	Min. 95% coverage (最少95%覆盖率)
Dielectric withstanding Voltage	绝缘耐压	No evidence of flashover, mechanical damages, arcing or insulation breakdown 无击穿, 飞弧及可见机械性损伤
Temperature cycling	温度循环	$\pm(1.0\%+0.005\Omega)$ Max. (最大)
Soldering heat	耐焊接热	$\pm(1.0\%+0.005\Omega)$ Max. (最大)
Load life in humidity	湿度寿命	1%: $\pm(1.0\%+0.005\Omega)$ Max. (最大) 5%: $\pm(3.0\%+0.005\Omega)$ Max. (最大)
Load life	负载寿命	1%: $\pm(1.0\%+0.005\Omega)$ Max. (最大) 5%: $\pm(3.0\%+0.005\Omega)$ Max. (最大)

* CS07 size in 0.75W 0.1~1 Ω 100PPM/°C could be provided specially (* CS07 0.75W 0.1~1 Ω 100PPM/°C 可特别提供)

Ordering Procedure (Example: CS12 1W 5% 22m Ω T/R-4000)

订购方式 (例如: CS12 1W 5% 22m Ω T/R-4000)



Feature (特性)

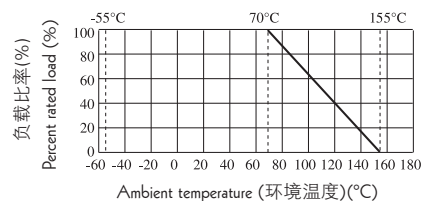
- Able to withstand high power 耐高功率
- Ultra Low sensing resistance 超低感应电阻
- Excellent frequency response 优秀的频率响应
- Excellent temperature coefficient characteristics 优秀的温度系数特性
- Lead free, RoHS compliant for global applications and halogen free
无铅, 符合ROHS并不含卤



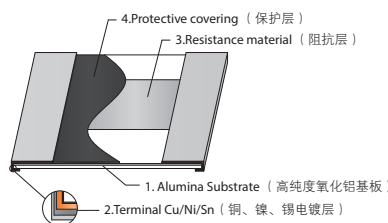
Application (应用)

- Mobile electronic equipment-Cellular phone, NB Tablet PC, GPS,DSC, HDD
移动电话、平板计算机、GPS、DSC、硬盘驱动器
- DC-DC converter, Adapter, Battery pack and charger
直流转换器、适配器、电池和充电器
- Switching power supply 开关电源
- Voltage Regulation module 电压调整模块
- Power management applications 电源管理应用程序

Derating Curve (降功率曲线)



Figures (型状)



Specification (性能)

Size 规格	Type 类型	Power Rating 功率 70°C	Dimension(尺寸)(mm)					Resistance Range 阻值范围 ±1% & ±5%	T.C.R. 温度系数 ppm/°C
			L	W	H	A	B		
1206	MS06	1W 1/2W	3.10±0.20	1.60±0.30	0.70±0.20	≤ 1.0	0.50~0.70±0.25	3 ~ 25mΩ	±150
1210	MS07	1.5W	3.10±0.20	2.50±0.25	0.70±0.20	≤ 1.0	0.65±0.25	3 ~ 25mΩ	±20
1812	MS11	2W	4.40±0.20	3.20±0.25	0.70±0.20	≤ 1.0	0.80±0.30	2 ~ 100mΩ	±20
2010	MS10	1W 1.5W	5.00±0.20	2.50±0.25	0.70±0.20	≤ 1.0	1.00±0.30	2 ~ 100mΩ	±50
2512	MS12	2W	6.35±0.20	3.20±0.25	0.70±0.20	≤ 1.0	1.2~1.9±0.30	2 ~ 100mΩ	±30
		3W	6.35±0.20	3.20±0.25	0.70±0.20	≤ 1.0	1.2~1.9±0.30	2~10mΩ	±30
2817	MS17	3W	7.10±0.20	4.20±0.20	0.70±0.20	≤ 1.0	1.10±0.30	2 ~ 100mΩ	±30
4320	MS20	3W 5W	11.00±0.30	5.00±0.25	0.65±0.20	≤ 1.0	2.5±0.3	2 ~ 33mΩ	±30
4527	MS27	3W 5W	11.60±0.30	6.70±0.25	0.60±0.20	≤ 1.0	2.50±0.30	2 ~ 50 mΩ	±30

* Other sizes and resistor values can be customized on request.

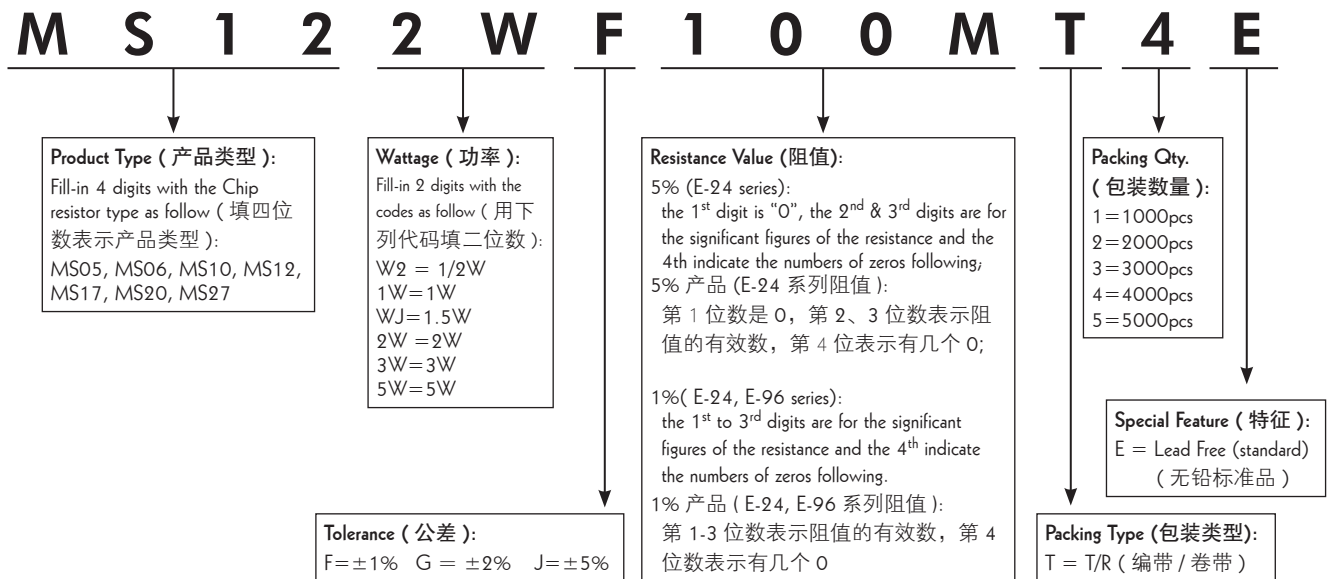
* 其他规格和阻值可特别提供

Performance Specifications (性能)

Short-time overload	短时间过负荷	1% & 2%: $\pm(1\%+0.001\ \Omega)$ Max (最大) 5%: $\pm(2\%+0.001\ \Omega)$ Max (最大)
Solderability	可焊性	Min 95% coverage (最少95%覆盖率)
Temperature cycling	温度循环	$\pm(0.5\%+0.005\ \Omega)$ Max. (最大)
Low Temperature Storage	低温放置	$\pm(1\%+0.001\ \Omega)$ Max. (最大)
High Temperature Exposure	高温放置	$\pm(1\%+0.001\ \Omega)$ Max. (最大)
Soldering heat	耐焊接热	$\pm(0.5\%+0.005\ \Omega)$ Max. (最大)
Load life in humidity	湿度寿命	1% & 2%: $\pm(1\%+0.001\ \Omega)$ Max. (最大) 5%: $\pm(3\%+0.001\ \Omega)$ Max. (最大)
Load life	负载寿命	1% & 2%: $\pm(1\%+0.001\ \Omega)$ Max. (最大) 5%: $\pm(3\%+0.001\ \Omega)$ Max. (最大)

Ordering Procedure (Example: MS12 2W 1% 10m Ω T/R-4000)

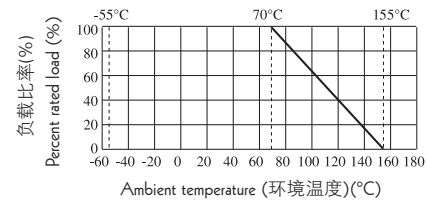
订购方式 (例如: MS12 2W 1% 10m Ω T/R-4000)



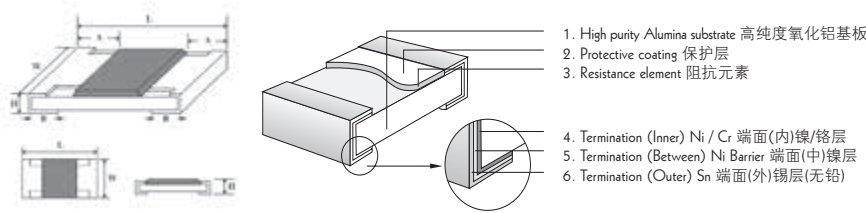
Feature (特性)

- Anti-Electro Static Discharge 抗静电
- High voltage 耐高压
- Suitable for reflow & wave soldering 适合波峰焊与回流焊
- Application Medical Devices, Industrial Controls, AV adapter, Flash lamp of camera, Automotive Industry, Outdoor Equipments
适用于医疗器械、工业控制、电源适配器、照相机的闪光灯、汽车工业及户外设备等

Derating Curve (降功率曲线)



Figures (型状)



Specification (性能)

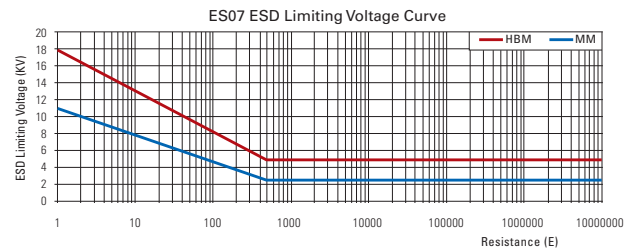
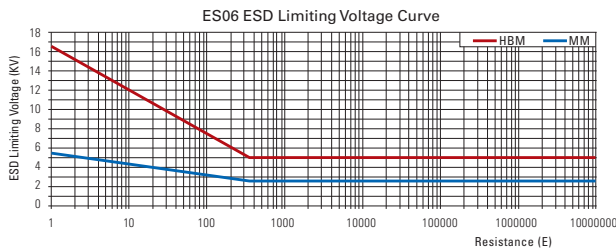
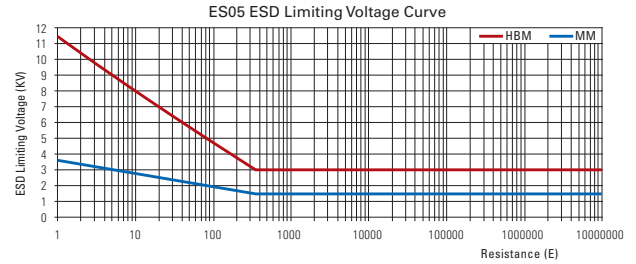
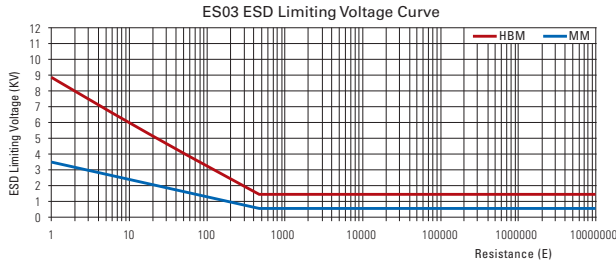
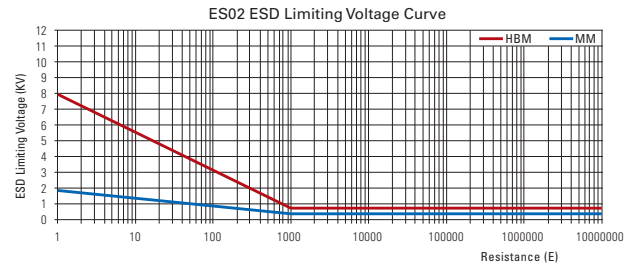
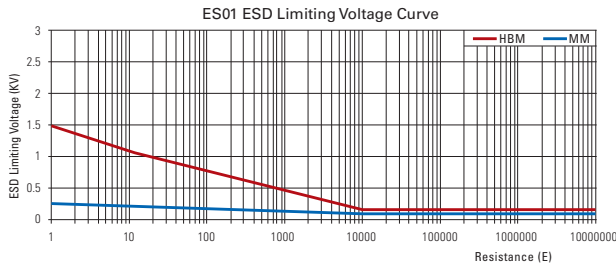
Type 类型	Max working voltage 最大工作电压	Max Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压	Operating Temperature 工作温度范围
ES01	25V	50V	/	-55~+155°C
ES02	50V	100V	100V	
ES03	200V	400V	300V	
ES05	400V	800V	500V	
ES06	500V	1000V	500V	
ES07	800V	1500V	500V	

Type 类型	Power 功率 (70°C)	L (mm)	W (mm)	H (mm)	A(mm)	B (mm)	Resistance Range 阻值范围 1% & 5%
ES01	1/20W	0.60±0.03	0.30±0.03	0.23±0.03	0.10±0.05	0.15±0.05	1Ω~10MΩ
ES02	1/16W	1.00±0.10	0.50±0.05	0.35±0.05	0.20±0.10	0.25±0.10	
ES03	1/16W 1/10W-S	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	
ES05	1/10W 1/8W-S	2.00±0.15	1.25 ^{+0.15} _{-0.10}	0.55±0.10	0.40±0.20	0.40±0.20	
ES06	1/8W 1/4W-S	3.10±0.15	1.55 ^{+0.15} _{-0.10}	0.55±0.10	0.45±0.20	0.45±0.20	
ES07	1/3W 1/2W-S	3.10±0.10	2.60±0.20	0.55±0.10	0.50±0.25	0.50±0.20	

Performance Specifications (性能)

Temperature coefficient 温度系数	ES01: 1Ω~10Ω: ±400ppm/°C 11Ω~10MΩ: ±200ppm/°C ES02~ES07: 1Ω~10Ω: ±200ppm/°C 11Ω~10MΩ: ±100ppm/°C	Humidity (Stead State) 恒定湿热	±1%: ±(0.5%+0.1Ω) Max (最大) ±5%: ±(3.0%+0.1Ω) Max (最大)
Short-time overload 短时间过负荷	±1%: ±(1.0%+0.1Ω) Max (最大) ±5%: ±(2.0%+0.1Ω) Max (最大)	Dielectric withstanding voltage 绝缘耐压	No evidence of flashover, mechanical damage, arcing or insulation breakdown 无击穿, 飞弧及可见机械性损伤
Terminal Bending 端子弯曲	±(1.0%+0.05Ω) Max (最大)	Temperature cycling 温度循环	±1%: ±(0.5%+0.05Ω) Max (最大) ±5%: ±(1.0%+0.05Ω) Max (最大)
Solderability 可焊性	Min 95% coverage (最少95%覆盖率)	Load life 负载寿命	±1%: ±(1.0%+0.1Ω) Max (最大) ±5%: ±(3.0%+0.1Ω) Max (最大)
Soldering heat 耐焊接热	±(1.0%+0.05Ω) Max (最大)	ESD 抗静电	±(1.0%+0.05Ω) Max (最大)

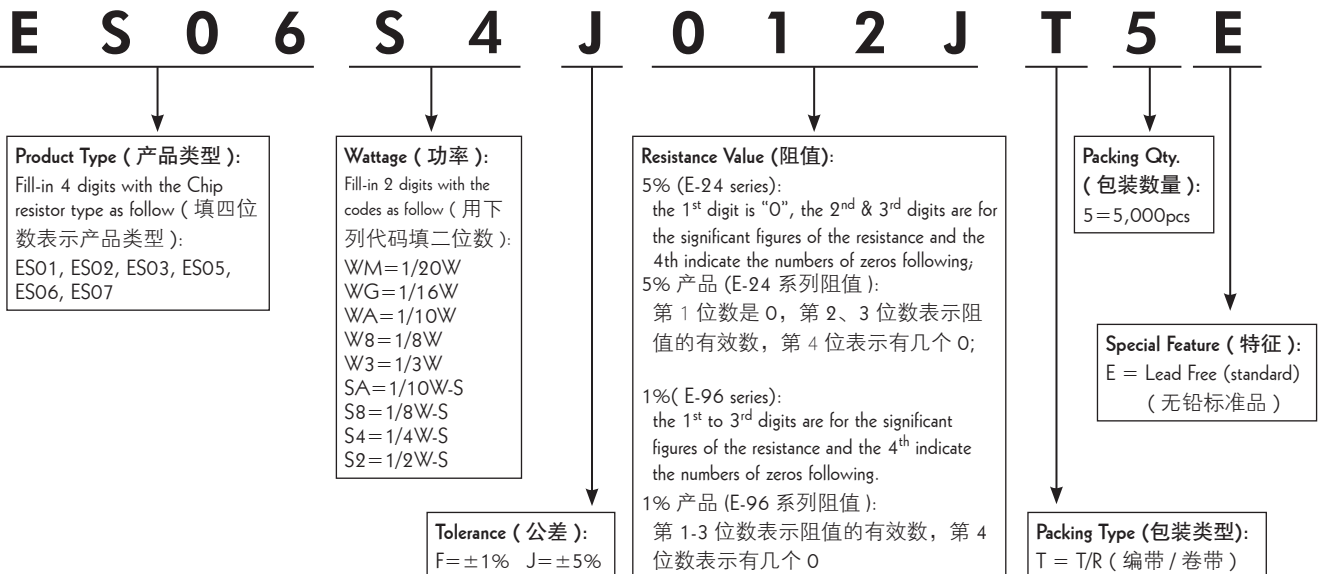
ESD Limiting Voltage Curve (抗静电曲线)



NOTE 备注: HBM:100PF 1K5 1Cycle; MM:200PF 0Q 1Cycle

Ordering Procedure (Example: ES06 1/4W-S 5% 1.2Ω T/R-5000)

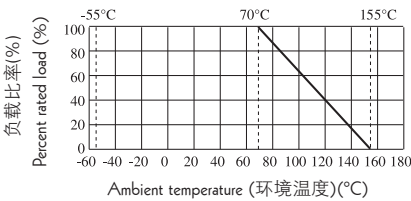
订购方式 (例如: ES06 1/4W-S 5% 1.2Ω T/R-5000)



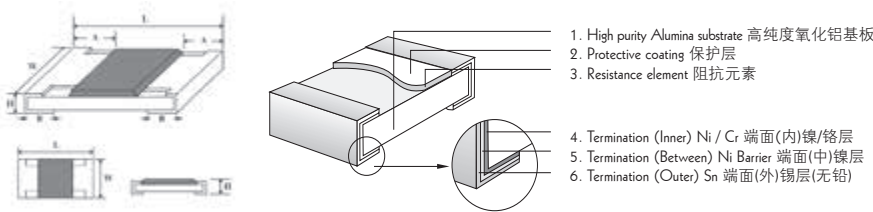
Feature (特性)

- Low T.C.R $\pm 50\text{PPM}/^{\circ}\text{C}$ 低T.C.R $\pm 50\text{PPM}/^{\circ}\text{C}$
- Suitable for reflow & wave soldering 适合波峰焊与回流焊
- Application Precision medical equipment, Auto industrial control system, Communication equipment, IPAD, Portable computer, LED lamps, Intelligent home ppliances
适用于精密医疗器械、自动工业控制系统、通讯设备、IPAD、手提电脑、LED灯具、智能家电产品等

Derating Curve (降功率曲线)



Figures (型状)



Specification (性能)

Type 类型	Max working voltage 最大工作电压	Max Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压	Operating Temperature 工作温度范围
LT02	50V	100V	100V	-55~+155°C
LT03	75V	150V	300V	
LT05	150V	300V	500V	
LT06	200V	400V	500V	

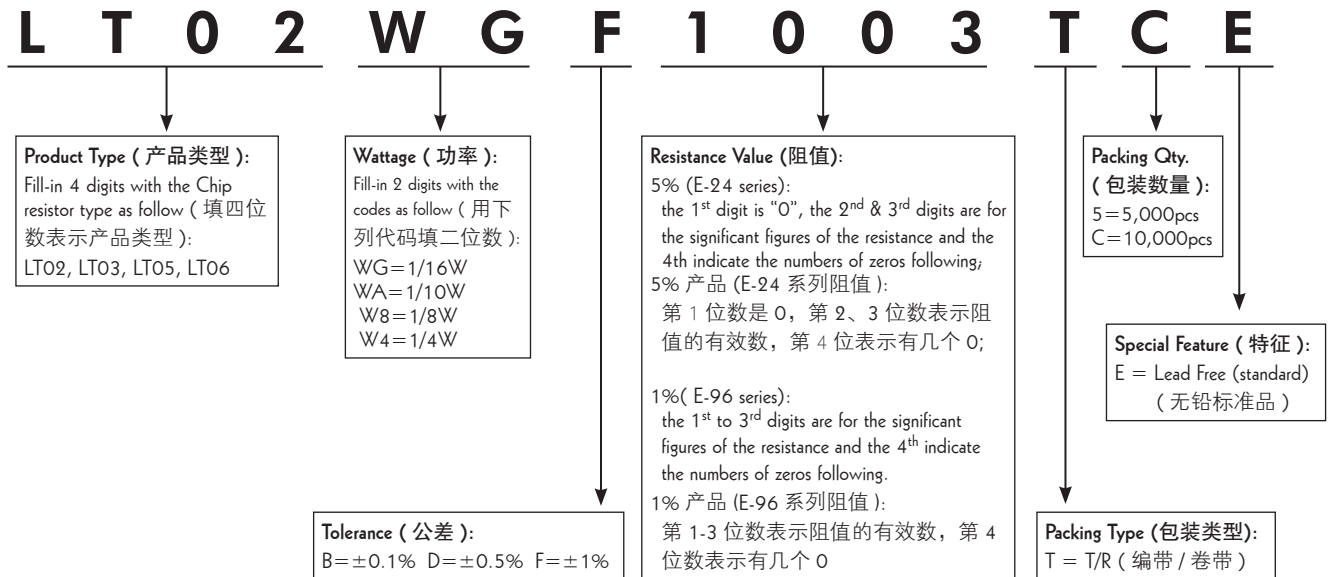
Type 类型	Power 功率 (70°C)	L (mm)	W (mm)	H (mm)	A(mm)	B (mm)	Resistance Range 阻值范围 0.25%, 0.5%, 1%
LT02	1/16W	1.00±0.10	0.50±0.05	0.35±0.05	0.20±0.10	0.25±0.10	100Ω~1MΩ
LT03	1/10W	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	10Ω~1MΩ
LT05	1/8W	2.00±0.15	1.25 ^{+0.15} _{-0.10}	0.55±0.10	0.40±0.20	0.40±0.20	
LT06	1/4W	3.10±0.15	1.55 ^{+0.15} _{-0.10}	0.55±0.10	0.45±0.20	0.45±0.20	

Performance Specifications (性能)

Temperature coefficient	温度系数	≤ ± 50ppm/°C
Short-time overload	短时间过负荷	± (1.0% + 0.1Ω) Max (最大)
Terminal Bending	端子弯曲	± (1.0% + 0.05Ω) Max (最大)
Solderability	可焊性	Min 95% coverage (最少95%覆盖率)
Soldering heat	耐焊接热	± (1.0% + 0.05Ω) Max (最大)
Humidity (Stead State)	恒定温湿	± (0.5% + 0.05Ω) Max (最大)
Load life	负载寿命	± (1.0% + 0.1Ω) Max (最大)

Ordering Procedure (Example: LT02 1/16W 1% 100KΩ T/R-10000)

订购方式 (例如: LT02 1/16W 1% 100KΩ T/R-10000)

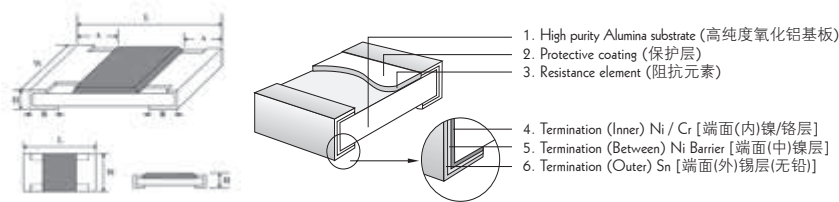


Feature (特性)

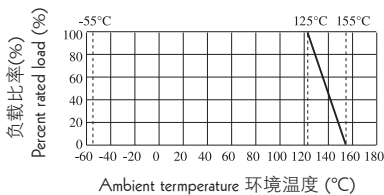
- The relevant provisions of the AEC-Q200。符合AEC-Q200相关条款
- Suitable for reflow & wave soldering. 适合波峰焊与回流焊
- Application car. 适用于汽车



Figures (型状)



Derating Curve 降功率曲线



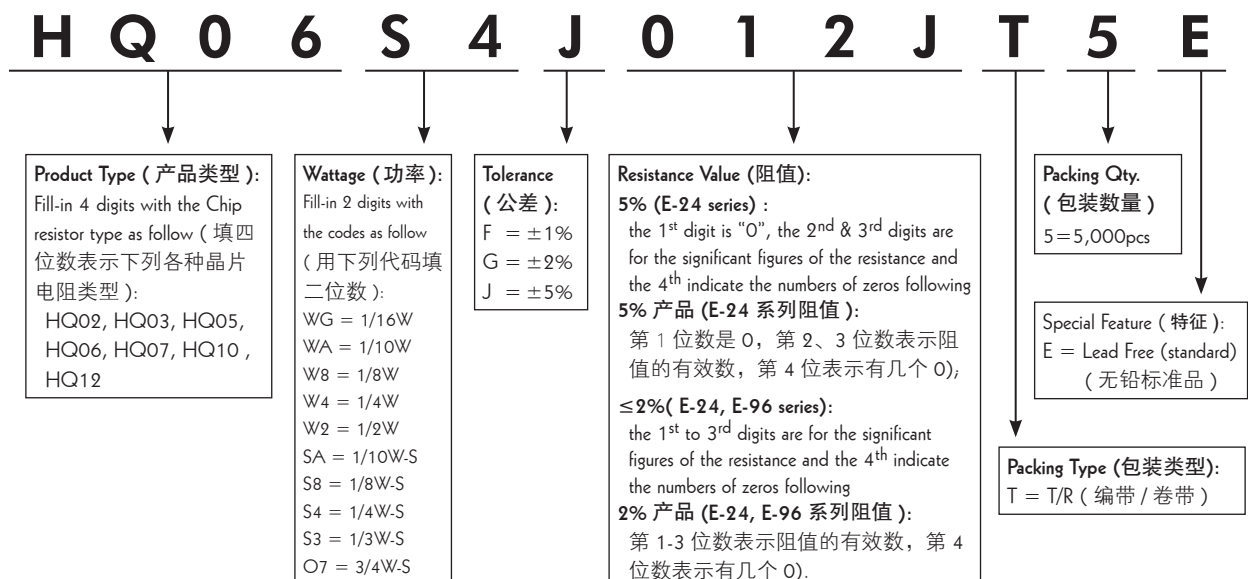
Specification (性能)

Type 类型	Max working voltage 最大工作电压	Max Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压	Resistance Value of Jumper 零欧姆电阻阻值	Rated Current Of Jumper 零欧姆电阻 额定电流	Max. Overload Current of Jumper 零欧姆电阻 最大过负荷电流	Operating Temperature 工作温度范围
HQ02	50V	100V	100V	< 50mΩ	1A	2A	-55~+155°C
HQ03	50V	100V	300V		1A	2A	
HQ05	150V	300V	500V		2A	5A	
HQ06	200V	400V	500V		2A	10A	
HQ07	200V	500V	500V		2A	10A	
HQ10	200V	500V	500V		2A	10A	
HQ12	200V	500V	500V		2A	10A	
Type 类型	Power 功率 (70°C)	L (mm)	W (mm)	H (mm)	A (mm)	B (mm)	Resistance Range 阻值范围 1%(E96), 5%(E24)
HQ02	1/16W	1.00±0.10	0.50±0.05	0.35±0.05	0.20±0.10	0.25±0.10	1Ω~10M
HQ03	1/16W (1/10W-S)	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	
HQ05	1/10W (1/8W-S)	2.00±0.15	1.25 ^{+0.15} _{-0.10}	0.55±0.10	0.40±0.20	0.40±0.20	
HQ06	1/8W (1/4W-S)	3.10±0.15	1.55 ^{+0.15} _{-0.10}	0.55±0.10	0.45±0.20	0.45±0.20	
HQ07	1/4W (1/3W-S)	3.10±0.10	2.60±0.20	0.55±0.10	0.50±0.25	0.50±0.20	
HQ10	1/2W (3/4W-S)	5.00±0.10	2.50±0.20	0.55±0.10	0.60±0.25	0.50±0.20	
HQ12	1W	6.35±0.10	3.20±0.20	0.55±0.10	0.60±0.25	1.80±0.25	

Performance Specification (性能)

试验项目 Test Item	试验方法 Test Methods	判定标准 Determine Specification
温度系数 Temperature coefficient	测定范围: -55°C ~ +125°C Measure between: -55°C ~ +125°C	$1\Omega \leq R \leq 10\Omega$: $\leq \pm 400\text{ppm}/^\circ\text{C}$ $11\Omega < R \leq 100\Omega$: $\leq \pm 200\text{ppm}/^\circ\text{C}$ $100\Omega < R \leq 10\text{M}\Omega$: $\leq \pm 100\text{ppm}/^\circ\text{C}$
短时间过负荷 Short-time overload	2.5 倍额定电压或最大过负荷电压 (取其低者), 持续 5 秒钟, 然后测阻值。 2.5x Rated voltage or Max. Overload Voltage whichever is lower for 5 seconds, then check the resistance.	$\pm 1\%: \pm (1.0\% + 0.1\Omega)\text{Max}$ (最大) $\pm 5\%: \pm (2.0\% + 0.1\Omega)\text{Max}$ (最大)
端子弯曲 Terminal Bending	弯曲距离 (Bending Distance): 5mm, 保持时间: 60s $\pm$ 5s, 然后测试阻值。 Duration: 60s $\pm$ 5s, then check the resistance.	$\pm (1.0\% + 0.05\Omega)\text{Max}$ (最大)
可焊性 Solderability	245 $\pm$ 3°C, 2~3 秒 245 $\pm$ 3°C, 2~3s	覆盖率 $\geq 95\%$ 95% coverage Min
耐焊接热 Soldering heat	260 $\pm$ 5°C, 10 $\pm$ 1 秒 260 $\pm$ 5°C, 10 $\pm$ 1s	$\pm (1.0\% + 0.05\Omega)\text{Max}$ (最大)
耐湿性 Moisture Resistance	25°C ~ 65°C, 90~100%RH, 2.5 小时; 65°C 90~100%RH, 3 小时; 65°C ~ 25°C, 80~100%RH, 2.5 小时, 10 个循环, 试验结束 24 小时后进行测试。 25°C ~ 65°C, 90~100%RH, 2.5H, 65°C 90~100%RH, 3H, 65°C ~ 25°C 80~100%RH, 2.5H, 10 cycles, Measurement at 24 hours after test conclusion MIL-STD-202 Method 106	$\pm 1\%: \pm (1.0\% + 0.1\Omega)\text{Max}$ (最大) $\pm 5\%: \pm (3.0\% + 0.1\Omega)\text{Max}$ (最大)
偏置湿度 Biased Humidity	10% 额定功率, 85°C/85%RH, 持续通电 1000 小时, 试验结束 24 小时后进行测试。 10% rated power, 85°C/85%RH, 1000H, Measurement at 24 hours after test conclusion MIL-STD-202 Method 103	$\pm 1\%: \pm (1.0\% + 0.1\Omega)\text{Max}$ (最大) $\pm 5\%: \pm (3.0\% + 0.1\Omega)\text{Max}$ (最大)
绝缘耐压 Dielectric withstanding voltage	电阻固定在 90°C 的 V 型槽中, 根据不同产品规定交流电压, 持续 60~70 秒。 Resistor shall be clamped in the trough of 90°C metallic V-block and shall be tested at AC potential respectively specified in the given list of each product type for 60~70s.	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	-55 $\pm$ 3°C (30 分钟) ~ 室温 (10-15 分钟) ~ 155 $\pm$ 2°C (30 分钟) ~ 室温 (10~15 分钟) 1000 个循环, 试验结束 24 小时后进行测试。 -55 $\pm$ 3°C 30min ~ normal temperature 10min-15min ~ 155 $\pm$ 2°C 30min ~ normal temperature 10min-15min 1000 cycles, Measurement at 24 hours after test conclusion. JESD22 Method JA-104	$\pm (1.0\% + 0.1\Omega)\text{Max}$ (最大)
负载寿命 Load life	125°C, 额定工作电压或最大工作电压 (取其低者), 持续时间: 1,000 小时 (1.5 小时 “通”, 0.5 小时 “断”), 试验结束 24 小时后进行测试。 125°C, at RCWV or Max. Working Voltage whichever less, 1,000 hours (1.5 hours “ON”, 0.5 hours “OFF”), Measurement at 24 $\pm$ 2 hours after test conclusion. MIL-STD-202 Method 108	$\pm 1\%: \pm (1.0\% + 0.1\Omega)\text{Max}$ (最大) $\pm 5\%: \pm (3.0\% + 0.1\Omega)\text{Max}$ (最大)

Ordering Procedure (Example: HQ06 1/4W-S 5% 1.2 Ω T/R-5000)

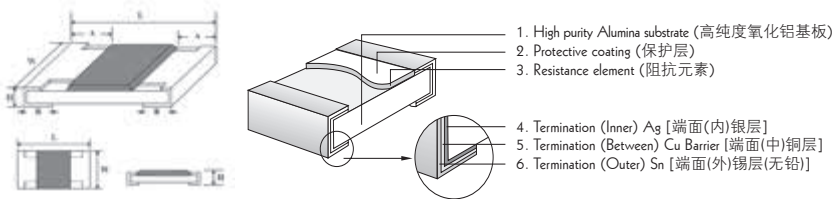
订购方式 (例如: HQ06 1/4W-S 5% 1.2 Ω T/R-5000)


Feature (特性)

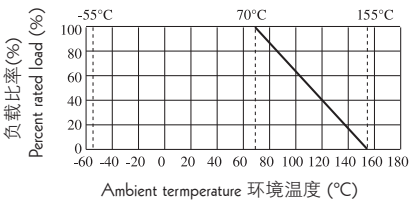
- Non-magnetic 无磁性
- Suitable for reflow & wave soldering 适合波峰焊与回流焊
- Application Mobile Phone, PDA, Setbox, Meter 适用于移动电话、PDA、机顶盒、仪表



Figures (型状)



Derating Curve (降功率曲线)



Specification (性能)

Type 类型	Max working voltage 最大工作电压	Max Overload Voltage 最大过负荷电压	Operating Temperature 工作温度范围
NM02	50V	100V	-55~+155°C
NM03	75V	150V	
NM05	150V	300V	

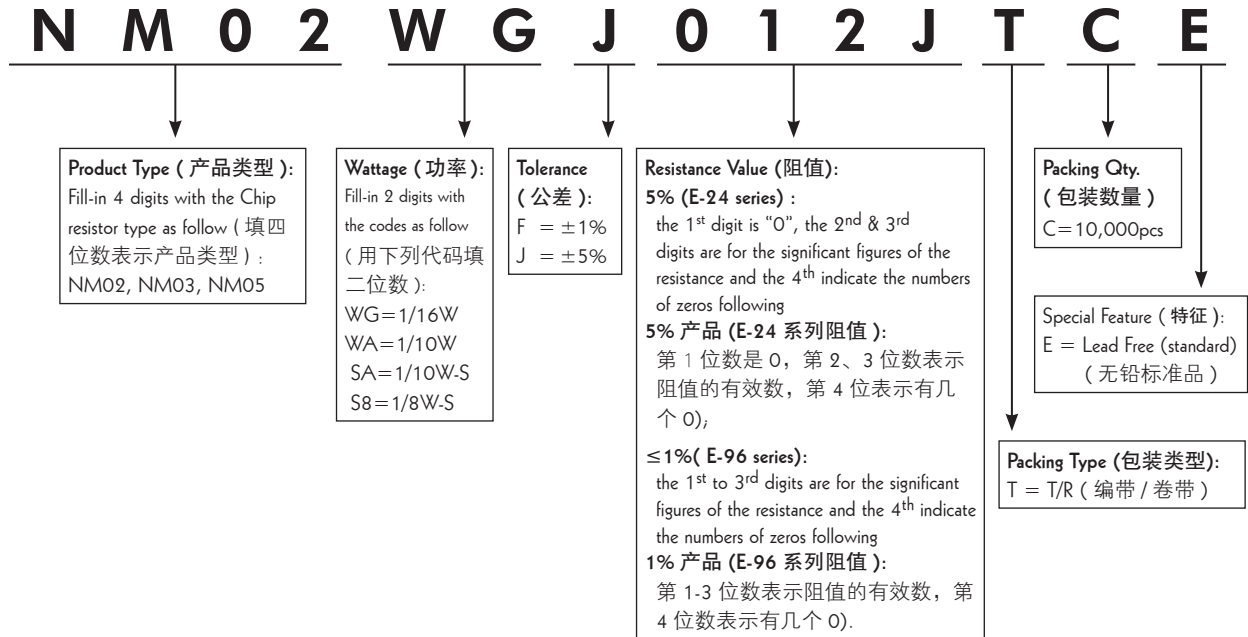
Type 类型	Power 功率 (70°C)	L (mm)	W (mm)	H (mm)	A (mm)	B (mm)	Resistance Range 阻值范围 1%(E96), 5%(E24)
NM02	1/16W	1.00±0.10	0.50±0.05	0.35±0.05	0.20±0.10	0.25±0.10	1Ω~10M
NM03	1/16W (1/10W-S)	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	
NM05	1/10W (1/8W-S)	2.00±0.15	1.25 ^{+0.15} _{-0.10}	0.55±0.10	0.40±0.20	0.40±0.20	

Performance Specification (性能)

Temperature coefficient	温度系数	1Ω~10 Ω: ≤±400ppm/°C 11Ω~100 Ω: ≤±200ppm/°C >100Ω: ±100ppm/°C
Short-time overload	短时间过负荷	±1%: ±(1.0%+0.1Ω)Max. (最大) ±5%: ±(2.0%+0.1Ω)Max. (最大)
Terminal bending	端子弯曲	±(1.0%+0.05Ω)Max. (最大)
Solderability	可焊性	Min. 95% Coverage (最少 95% 覆盖率)
Soldering heat	耐焊接热	±(1.0%+0.05Ω) Max. (最大)
Humidity (Steady State)	恒定湿热	±1%: ±(0.5%+0.1Ω)Max. (最大) ±5%: ±(3.0%+0.1Ω) Max. (最大)
Dielectric withstanding voltage	绝缘耐压	No evidence of flashover, mechanical damage, arcing or insulation breakdown 无击穿, 飞弧及可见机械性损伤
Temperature Cycling	温度循环	±1%: ±(0.5%+0.05Ω) Max.(最大) ±5%: ±(1.0%+0.05Ω) Max.(最大)
Load life	负载寿命	±1%: ±(1.0%+0.1Ω) Max.(最大) ±5%: ±(3.0%+0.1Ω) Max.(最大)

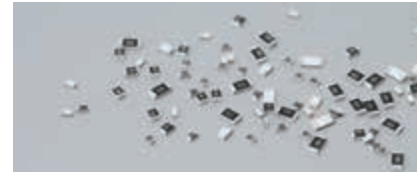
Ordering Procedure (Example: NM02 1/16W 5% 1.2 Ω T/R-10000)

订购方式 (例如: NM02 1/16W 5% 1.2 Ω T/R-10000)

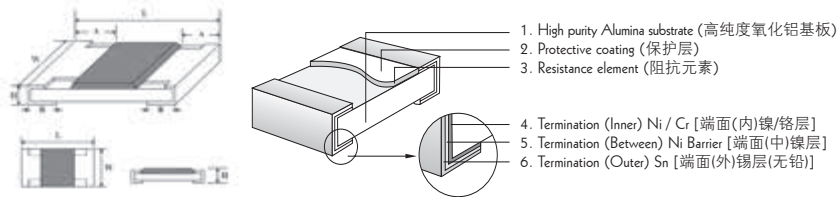


Feature (特性)

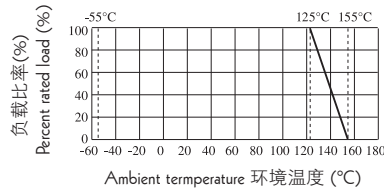
- Application automobile, The relevant provisions of the AEC-Q200
适用于汽车, 符合 AEC-Q200 相关条款
- Excellent Anti-sulfurized performance
抗硫化性能强: H_2S 1000ppm, $25^\circ\text{C} \pm 2^\circ\text{C}$, 90%RH, 720H, $\Delta R \leq \pm 0.5\%$
- Superior Anti-Surge Voltage performance 优越的抗浪涌电压特性
- Suitable for reflow & wave soldering (适合波峰焊与回流焊)
- Application car, power (适用于汽车、电源等)



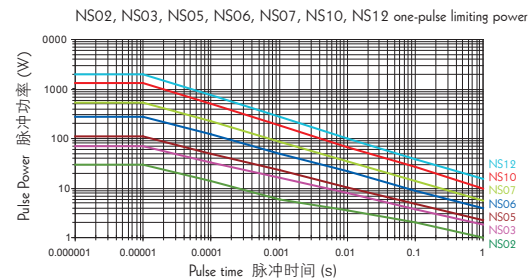
Figures (型状)



Derating Curve (降功率曲线)



Curve of Pulse Duration (脉冲曲线)



Specification (性能)

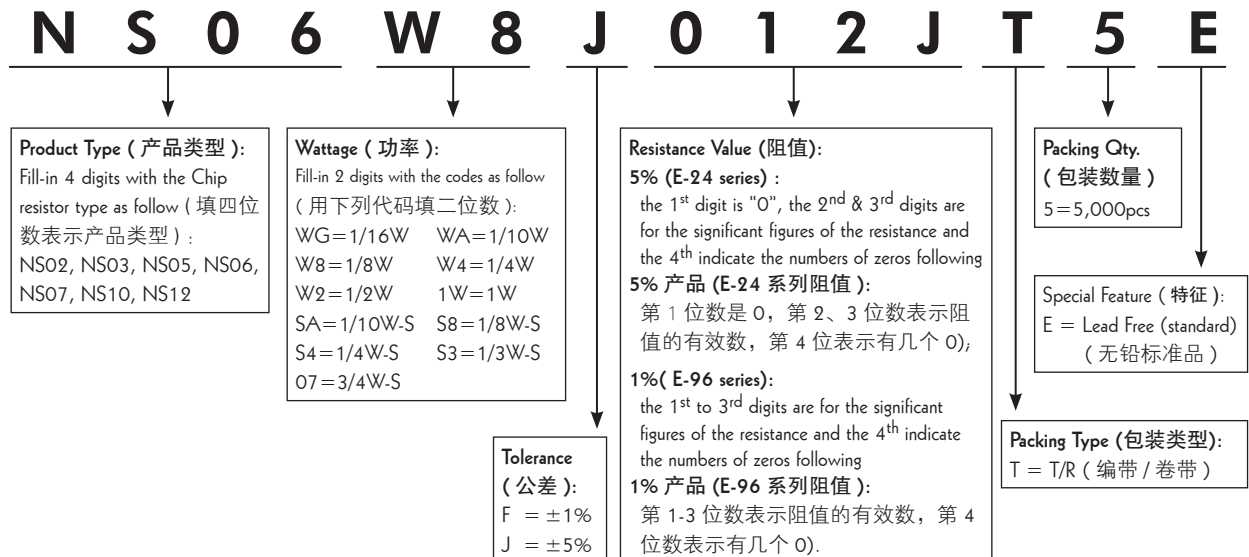
Type 类型	Max working voltage 最大工作电压	Max Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压	Resistance Value of Jumper 零欧姆电阻阻值	Rated Current of Jumper 零欧姆电阻 额定电流	Max. Overload Current of Jumper 零欧姆电阻 最大过负荷电流	Operating Temperature 工作温度范围
NS01	25V	50V	/	< 50mΩ	0.5A	1A	-55~+155°C
NS02	50V	100V	100V	< 50mΩ	1A	2A	
NS03	75V	150V	300V	< 50mΩ	1A	2A	
NS05	150V	300V	500V	< 50mΩ	2A	5A	
NS06	200V	400V	500V	< 50mΩ	2A	10A	
NS07	200V	500V	500V	< 50mΩ	2A	10A	
NS10	200V	500V	500V	< 50mΩ	2A	10A	
NS12	200V	500V	500V	< 50mΩ	2A	10A	

Type 类型	Power 功率 (70°C)	L (mm)	W (mm)	H (mm)	A (mm)	B (mm)	Resistance Range 阻值范围 1%(E96), 5%(E24)
NS01	1/20W	0.60±0.03	0.30±0.03	0.23±0.03	0.12±0.05	0.15±0.05	1Ω~10M
NS02	1/16W	1.00±0.10	0.50±0.05	0.35±0.05	0.20±0.10	0.25±0.10	
NS03	1/16W (1/10W-S)	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	
NS05	1/10W (1/8W-S)	2.00±0.15	1.25 ^{+0.15} _{-0.10}	0.55±0.10	0.40±0.20	0.40±0.20	
NS06	1/8W (1/4W-S)	3.10±0.15	1.55 ^{+0.15} _{-0.10}	0.55±0.10	0.45±0.20	0.45±0.20	
NS07	1/4W (1/3W-S)	3.10±0.10	2.60±0.20	0.55±0.10	0.50±0.25	0.50±0.20	
NS10	1/2W (3/4W-S)	5.00±0.10	2.50±0.20	0.55±0.10	0.60±0.25	0.50±0.20	
NS12	1W	6.35±0.10	3.20±0.20	0.55±0.10	0.60±0.25	1.80±0.25	0Ω

Performance Specification (性能)

试验项目 Test Item	试验方法 Test Methods	判定标准 Determine Specification
温度系数 Temperature coefficient	测定范围: -55°C ~ +125°C Measure between -55°C ~ +125°C	$1\Omega \leq R \leq 10\Omega$: $\leq \pm 400 \text{ ppm}/^\circ\text{C}$ $10\Omega < R \leq 100\Omega$: $\leq \pm 200 \text{ ppm}/^\circ\text{C}$ $100\Omega < R \leq 10\text{M}\Omega$: $\leq \pm 100 \text{ ppm}/^\circ\text{C}$ NS01: $10\Omega < R \leq 10\text{M}\Omega$: $\pm 200 \text{ ppm}/^\circ\text{C}$
短时间过负荷 Short-time overload	2.5 倍额定电压或最大过负荷电压 (取其低者), 持续 5 秒钟, 然后测阻值。 2.5x Rated voltage or Max. Overload Voltage whichever is lower for 5 seconds, then check the resistance.	$\pm 1\%$: $\pm (1.0\% + 0.1\Omega) \text{Max}$ (最大) $\pm 5\%$: $\pm (2.0\% + 0.1\Omega) \text{Max}$ (最大)
端子弯曲 Terminal Bending	弯曲距离 (Bending Distance): 5mm, 保持时间: 60s $\pm$ 5s, 然后测试阻值。 Duration: 60s $\pm$ 5s, then check the resistance.	$\pm (1.0\% + 0.05\Omega) \text{Max}$ (最大)
可焊性 Solderability	245 $\pm$ 3°C, 2~3 秒 245 $\pm$ 3°C, 2~3s	覆盖率 $\geq 95\%$ 95% coverage Min
耐焊接热 Soldering heat	260 $\pm$ 5°C, 10 $\pm$ 1 秒 260 $\pm$ 5°C, 10 $\pm$ 1s	$\pm (1.0\% + 0.05\Omega) \text{Max}$ (最大)
耐湿性 Moisture Resistance	25°C ~ 65°C, 90~100%RH, 2.5 小时; 65°C 90~100%RH, 3 小时; 65°C ~ 25°C, 80~100%RH, 2.5 小时, 10 个循环, 试验结束 24 小时后进行测试。 25°C ~ 65°C, 90~100%RH, 2.5H; 65°C 90~100%RH, 3H; 65°C ~ 25°C 80~100%RH, 2.5H, 10 cycles, Measurement at 24 hours after test conclusion MIL-STD-202 Method 106	$\pm 1\%$: $\pm (1.0\% + 0.1\Omega) \text{Max}$ (最大) $\pm 5\%$: $\pm (3.0\% + 0.1\Omega) \text{Max}$ (最大)
偏置湿度 Biased Humidity	10% 额定功率, 85°C/85%RH, 持续通电 1000 小时, 试验结束 24 小时后进行测试。 10% rated power, 85°C/85%RH, 1000H, Measurement at 24 hours after test conclusion MIL-STD-202 Method 103	$\pm 1\%$: $\pm (1.0\% + 0.1\Omega) \text{Max}$ (最大) $\pm 5\%$: $\pm (3.0\% + 0.1\Omega) \text{Max}$ (最大)
绝缘耐压 Dielectric withstanding voltage	电阻固定在 90°C 的 V 型槽中, 根据不同产品规定交流电压, 持续 60~70 秒。Resistor shall be clamped in the trough of 90°C metallic V-block and shall be tested at AC potential respectively specified in the given list of each product type for 60~70s.	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	-55 $\pm$ 3°C (30 分钟) ~ 室温 (10~15 分钟) ~ 155 $\pm$ 2°C (30 分钟) ~ 室温 (10~15 分钟) 1000 个循环, 试验结束 24 小时后进行测试。 -55 $\pm$ 3°C 30min ~ normal temperature 10min-15min ~ 155 $\pm$ 2°C 30min ~ normal temperature 10min-15min 1000 cycles, Measurement at 24 hours after test conclusion. JESD22 Method JA-104	$\pm (1.0\% + 0.1\Omega) \text{Max}$ (最大)
负载寿命 Load life	125°C, 额定功率, 试验结束 24 小时后进行测试。 125°C, at rated power, Measurement at 24 $\pm$ 2 hours after test conclusion. MIL-STD-202 Method 108	$\pm 1\%$: $\pm (1.0\% + 0.1\Omega) \text{Max}$ (最大) $\pm 5\%$: $\pm (3.0\% + 0.1\Omega) \text{Max}$ (最大)
硫化测试 Sulfuration test	H ₂ S 1000ppm, 25°C $\pm$ 2°C 90%RH, 720H	NS02~NS12: $\Delta R \leq \pm (0.5\% + 0.1\Omega)$ NS01: $\Delta R \leq \pm (3\% + 0.1\Omega)$

Ordering Procedure (Example: NS06 1/8W 5% 1.2 Ω T/R-5000)

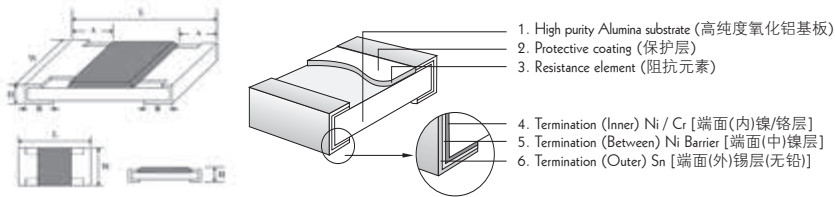
订购方式 (例如: NS06 1/8W 5% 1.2 Ω T/R-5000)


Feature (特性)

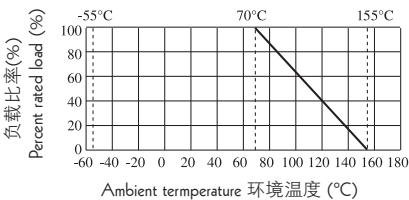
- Anti-Sulfidation 抗硫化
- The relevant provisions of the AEC-Q200 符合 AEC-Q200 相关条款
- Suitable for reflow & wave soldering 适合波峰焊与回流焊
- Application car、IPAD、LED lamps、Intelligent home appliances, Medical equipment, Kinds of industrial control devices &Industrial supplies
适用于汽车、IPAD、LED 灯具、智能家电产品、医疗设备、各种工业控制装置及工业电源等



Figures (型状)



Derating Curve (降功率曲线)



Specification (性能)

Type 类型	Max working voltage 最大工作电压	Max Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压	Resistance Value of Jumper 零欧姆电阻阻值	Rated Current of Jumper 零欧姆电阻 额定电流	Max. Overload Current of Jumper 零欧姆电阻 最大过负荷电流	Operating Temperature 工作温度范围
CQ02	50V	100V	100V	<50mΩ	1A	2A	-55~+155°C
CQ03	75V	150V	300V	<50mΩ	1A	2A	
CQ05	150V	300V	500V	<50mΩ	2A	5A	
CQ06	200V	400V	500V	<50mΩ	2A	10A	
CQ07	200V	500V	500V	<50mΩ	2A	10A	
CQ10	200V	500V	500V	<50mΩ	2A	10A	
CQ12	200V	500V	500V	<50mΩ	2A	10A	

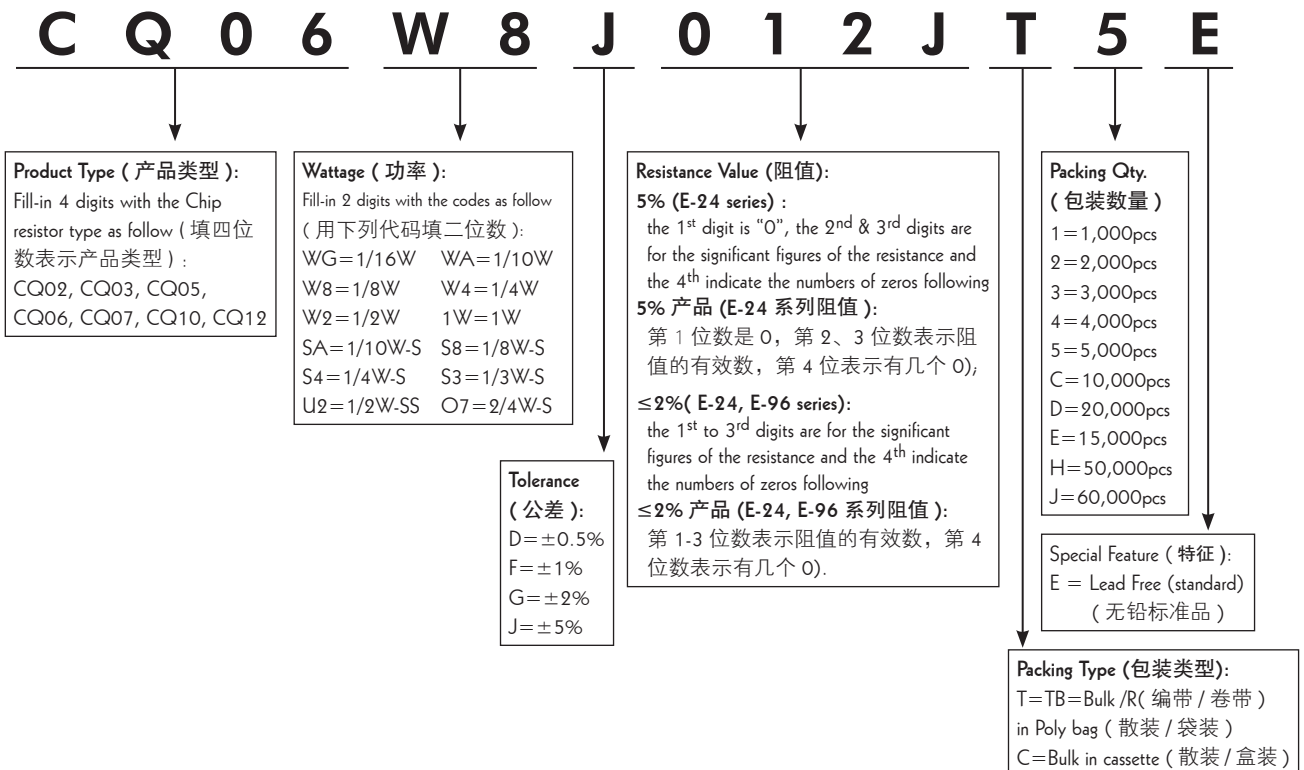
Type 类型	Power 功率 (70°C)	L (mm)	W (mm)	H (mm)	A (mm)	B (mm)	Resistance Range 阻值范围
CQ02	1/16W	1.00±0.10	0.50±0.05	0.35±0.05	0.20±0.10	0.25±0.10	0.5%, 1%, 2%, 5%: 1Ω~10M 0Ω
CQ03	1/16W, 1/10W-S	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	
CQ05	1/10W, 1/8W-S	2.00±0.15	1.25 ^{+0.15} _{-0.10}	0.55±0.10	0.40±0.20	0.40±0.20	
CQ06	1/8W, 1/4W-S	3.10±0.15	1.55 ^{+0.15} _{-0.10}	0.55±0.10	0.45±0.20	0.45±0.20	
CQ07	1/4W, 1/3W-S, 1/2W-SS	3.10±0.10	2.60±0.20	0.55±0.10	0.50±0.25	0.50±0.20	
CQ10	1/2W, 3/4W-S	5.00±0.10	2.50±0.20	0.55±0.10	0.60±0.25	0.50±0.20	
CQ12	1W	6.35±0.10	3.20±0.20	0.55±0.10	0.60±0.25	0.50±0.20	

Performance Specification (性能)

Temperature coefficient	温度系数	1Ω~10 Ω: $\leq \pm 400\text{ppm}/^\circ\text{C}$ 11Ω~100 Ω: $\leq \pm 200\text{ppm}/^\circ\text{C}$ >100Ω: $\pm 100\text{ppm}/^\circ\text{C}$
Short-time overload	短时间过负荷	$\pm 0.5\%$, $\pm 1\%$: $\pm (1\% \pm (1.0\% + 0.1\Omega)\text{Max})$ (最大) $\pm 2\%$, $\pm 5\%$: $\pm (2.0\% + 0.1\Omega)\text{Max}$ (最大)
Terminal bending	端子弯曲	$\pm (1.0\% + 0.05\Omega)\text{Max}$. (最大)
Solderability	可焊性	Min. 95% Coverage (最少 95% 覆盖率)
Soldering heat	耐焊接热	$\pm (1.0\% + 0.05\Omega)\text{Max}$. (最大)
Moisture Resistance	耐湿性	$\pm 0.5\%$, $\pm 1\%$: $\pm (0.5\% + 0.1\Omega)\text{Max}$ $\pm 2\%$, $\pm 5\%$: $\pm (3.0\% + 0.1\Omega)\text{Max}$
Biased Humidity	偏置湿度	$\pm 0.5\%$, $\pm 1\%$: $\pm (1.0\% + 0.1\Omega)\text{Max}$ $\pm 2\%$, $\pm 5\%$: $\pm (3.0\% + 0.1\Omega)\text{Max}$
Dielectric withstanding voltage	绝缘耐压	No evidence of flashover, mechanical damage, arcing or insulation breakdown 无击穿, 飞弧及可见机械性损伤
Temperature Cycling	温度循环	$\pm 0.5\%$, $\pm 1\%$: $\pm (0.5\% + 0.1\Omega)\text{Max}$. (最大) $\pm 2\%$, $\pm 5\%$: $\pm (1.0\% + 0.1\Omega)\text{Max}$. (最大)
Load life	负载寿命	$\pm 1\%$: $\pm (1.0\% + 0.1\Omega)\text{Max}$. (最大) $\pm 5\%$: $\pm (3.0\% + 0.1\Omega)\text{Max}$. (最大)
ESD	抗静电	$\pm (1.0\% + 0.05\Omega)\text{Max}$. (最大)
* Sulfuration test	硫化测试	H ₂ S 3~5PPM 50°C $\pm$ 2°C 91%~93%RH 1000H

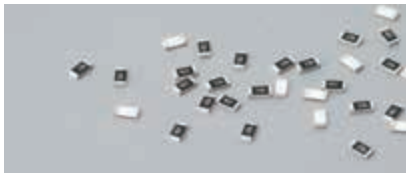
Ordering Procedure (Example: CQ06 1/8W 5% 1.2E T/R500)

订购方式 (例如: CQ06 1/8W 5% 1.2E T/R500)

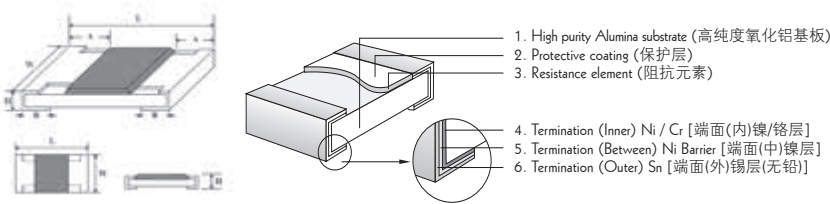


Feature (特性)

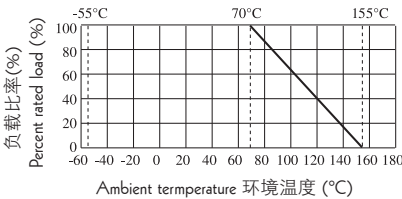
- Suitable for reflow & wave soldering (适合波峰焊与回流焊)
- Application Soft Circuit board (适用于软性电路板)



Figures (型状)



Derating Curve (降功率曲线)



Specification (性能)

Type 类型	Max working voltage 最大工作电压	Max Overload Voltage 最大过负荷电压	Dielectric Withstanding Voltage 绝缘耐压	Operating Temperature 工作温度范围
LE03	75V	150V	300V	-55~+155°C
LE05	150V	300V	500V	-55~+155°C
LE06	200V	400V	500V	-55~+155°C

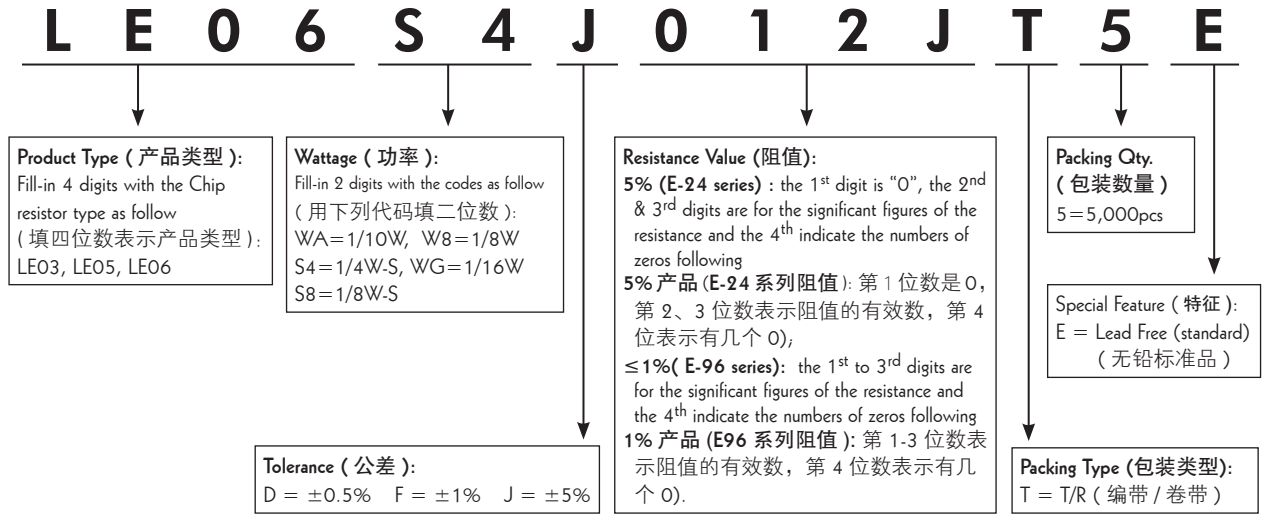
Type 类型	Power 功率 (70°C)	L (mm)	W (mm)	H (mm)	A (mm)	B (mm)	Resistance Range 阻值范围 0.5%, 1%, 5%
LE03	1/16W (1/10W-S)	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	1Ω~10M 0Ω
LE05	1/10W (1/8W-S)	2.00±0.15	1.25 ^{+0.15} _{-0.10}	0.55±0.10	0.40±0.20	0.40±0.20	1Ω~10M 0Ω
LE06	1/8W (1/4W-S)	3.10±0.15	1.55 ^{+0.15} _{-0.10}	0.55±0.10	0.45±0.20	0.45±0.20	1Ω~10M 0Ω

Performance Specification (性能)

Temperature coefficient	温度系数	1Ω~10Ω: ≤±400ppm / °C 11Ω~100Ω: ≤±200ppm / °C > 100Ω: ≤±100ppm / °C
Short-time overload	短时间过负荷	±5%, ±2%: ±(2.0%+0.1Ω)Max. (最大) ±1%, ±0.5%: ±(1.0%+0.1Ω)Max. (最大)
Terminal bending	端子弯曲	±(1.0%+0.05Ω)Max. (最大)
Solderability	可焊性	Min. 95% Coverage (最少 95% 覆盖率)
Soldering heat	耐焊接热	±(1.0%+0.05Ω) Max. (最大)
Humidity (Steady State)	恒定湿热	±5%, ±2%: ±(3.0%+0.1Ω)Max. (最大) ±1%, ±0.5%: ±(0.5%+0.1Ω)Max. (最大)
Dielectric withstanding voltage	绝缘耐压	No evidence of flashover, mechanical damage, arcing or insulation breakdown 无击穿, 飞弧及可见机械性损伤
Temperature Cycling	温度循环	±5%, ±2%: ±(1.0%+0.05Ω)Max. (最大) ±1%, ±0.5%: ±(0.5%+0.05Ω)Max. (最大)
Load life	负载寿命	±5%, ±2%: ±(3.0%+0.1Ω)Max. (最大) ±1%, ±0.5%: ±(1.0%+0.1Ω)Max. (最大)

Ordering Procedure (Example: LE06 1/4W-S 5% 1.2 Ω T/R-5000)

订购方式 (例如: LE06 1/4W-S 5% 1.2 Ω T/R-5000)



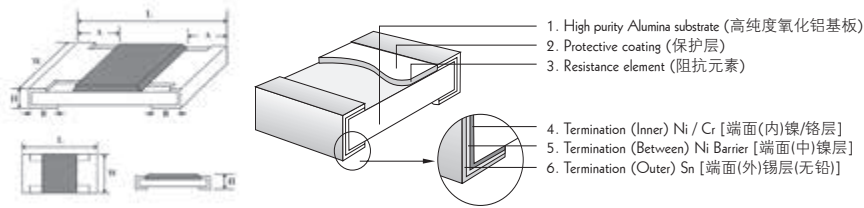
Feature (特性)

- Thin film NiCr Resistance element 薄膜镍铬阻抗元件
- Very tight tolerance from 精密的公差从 $\pm 0.10\%$, $\pm 0.25\%$
- Extremely low TCR from 极低的 TCR 从 $\pm 5 \sim \pm 50 \text{ PPM}/^\circ\text{C}$
- Totally Lead-free 完全无铅产品

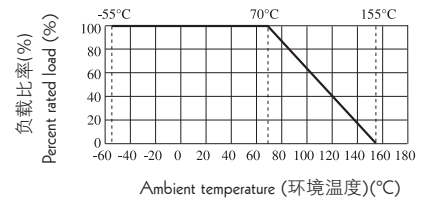
Application (应用)

- Medical Equipment 医疗器材
- Testing / Measurement Equipment 检测仪器
- Communication Device, Cell Phone, GPS, PDA. 通讯用具, 手机, GPS, PDA
- Automatic equipment controller 自动化设备控制器
- Printer Equipment 打印器材
- Converters 变频器

Figures (型状)



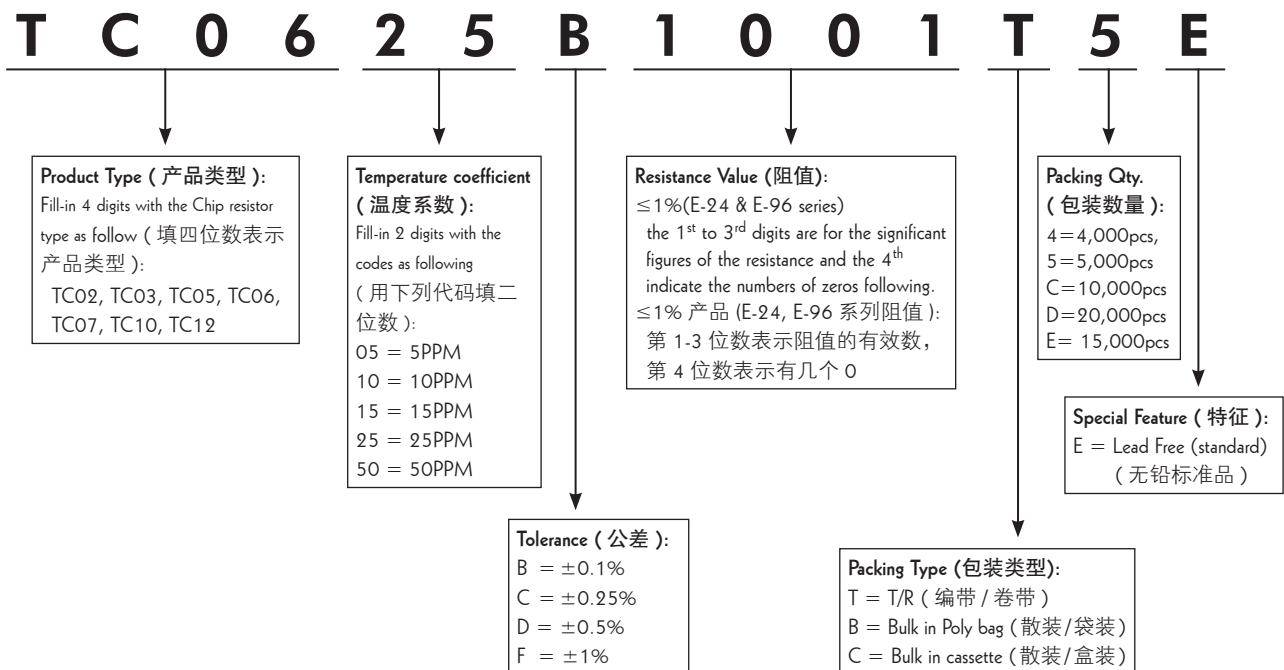
Derating Curve (降功率曲线)



Type 类型	L (mm)	W (mm)	H (mm)	A (mm)	B (mm)
TC02	1.00 $\pm$ 0.10	0.50 $\pm$ 0.05	0.35 $\pm$ 0.05	0.20 $\pm$ 0.10	0.25 $\pm$ 0.10
TC03	1.60 $\pm$ 0.10	0.80 $\pm$ 0.10	0.45 $\pm$ 0.10	0.30 $\pm$ 0.20	0.30 $\pm$ 0.20
TC05	2.00 $\pm$ 0.15	1.25 $\begin{smallmatrix} +0.15 \\ -0.10 \end{smallmatrix}$	0.55 $\pm$ 0.10	0.40 $\pm$ 0.20	0.40 $\pm$ 0.20
TC06	3.10 $\pm$ 0.15	1.55 $\begin{smallmatrix} +0.15 \\ -0.10 \end{smallmatrix}$	0.55 $\pm$ 0.10	0.45 $\pm$ 0.20	0.45 $\pm$ 0.20
TC07	3.10 $\pm$ 0.10	2.60 $\pm$ 0.20	0.55 $\pm$ 0.10	0.45 $\pm$ 0.20	0.45 $\pm$ 0.20
TC10	5.00 $\pm$ 0.10	2.50 $\pm$ 0.20	0.55 $\pm$ 0.10	0.60 $\pm$ 0.25	0.50 $\pm$ 0.20
TC12	6.35 $\pm$ 0.10	3.20 $\pm$ 0.20	0.55 $\pm$ 0.10	0.60 $\pm$ 0.25	0.50 $\pm$ 0.20

Ordering Procedure (Example: Thin Film TC06 1/8W 0.1% 25PPM 1K Ω T/R-5000)

订购方式(例如: 薄膜TC06 1/8W 0.1% 25PPM 1K Ω T/R-5000)



Performance Specification (性能)

Short-time overload	短时间过负荷	$\Delta R \leq \pm 0.5\%$
Insulation Resistance	绝缘电阻	$\geq 1000M\Omega$
Load life	负载寿命	$\Delta R \leq \pm 0.2\%$ $> 7K\Omega$ $\Delta R \leq \pm 0.5\%$
Humidity (Steady State)	恒定湿热	$\Delta R \leq \pm 0.3\%$
Terminal bending	端子弯曲	$\Delta R \leq \pm 0.2\%$
Solderability	可焊性	Min 95% coverage (最少 95% 覆盖率)
Soldering heat	耐焊接热	$\Delta R \leq \pm 0.2\%$

Characteristics (特性)

Type 类型	Power Rating 功率 at 70°C	Operating Temperature 工作温度范围	Max. Working Voltage 最大工作电压	Max. Overload Voltage 最大过负荷电压	Resistance Range 阻值范围				TCR 温度系数
					$\pm 0.10\%$	$\pm 0.25\%$	$\pm 0.5\%$	$\pm 1\%$	
TC02	1/16W	-55°C~+155°C	25V	50V	100Ω~2KΩ	100Ω~2KΩ	100Ω~2KΩ		$\pm 5 \text{ PPM/}^\circ\text{C}$
					50Ω~12KΩ	50Ω~12KΩ	50Ω~12KΩ		$\pm 10 \text{ PPM/}^\circ\text{C}$
					10Ω~332KΩ	10Ω~332KΩ	10Ω~332KΩ		$\pm 25 \text{ PPM/}^\circ\text{C}$
					10Ω~332KΩ	10Ω~332KΩ	10Ω~332KΩ		$\pm 50 \text{ PPM/}^\circ\text{C}$
TC03	1/16W	-55°C~+155°C	50V	100V	100Ω~4KΩ	100Ω~4KΩ	100Ω~4KΩ		$\pm 5 \text{ PPM/}^\circ\text{C}$
					50Ω~50KΩ	50Ω~50KΩ	50Ω~50KΩ		$\pm 10 \text{ PPM/}^\circ\text{C}$
					4.7Ω~1MΩ	1.5Ω~1MΩ	1Ω~1MΩ		$\pm 25 \text{ PPM/}^\circ\text{C}$
					4.7Ω~1MΩ	1.5Ω~1MΩ	1Ω~1MΩ		$\pm 50 \text{ PPM/}^\circ\text{C}$
TC05	1/10W	-55°C~+155°C	100V	200V	100Ω~10KΩ	100Ω~10KΩ	100Ω~10KΩ		$\pm 5 \text{ PPM/}^\circ\text{C}$
					50Ω~100KΩ	50Ω~100KΩ	50Ω~100KΩ		$\pm 10 \text{ PPM/}^\circ\text{C}$
					4.7Ω~1MΩ	1Ω~1MΩ	1Ω~1MΩ		$\pm 25 \text{ PPM/}^\circ\text{C}$
					4.7Ω~1MΩ	1Ω~1MΩ	1Ω~1MΩ		$\pm 50 \text{ PPM/}^\circ\text{C}$
TC06	1/8W	-55°C~+155°C	150V	300V	100Ω~15KΩ	100Ω~15KΩ	100Ω~15KΩ		$\pm 5 \text{ PPM/}^\circ\text{C}$
					50Ω~200KΩ	50Ω~200KΩ	50Ω~200KΩ		$\pm 10 \text{ PPM/}^\circ\text{C}$
					4.7Ω~1MΩ	1Ω~1MΩ	1Ω~1MΩ		$\pm 25 \text{ PPM/}^\circ\text{C}$
					4.7Ω~1MΩ	1Ω~1MΩ	1Ω~1MΩ		$\pm 50 \text{ PPM/}^\circ\text{C}$
TC07	1/5W	-55°C~+155°C	150V	300V	100Ω~25KΩ	100Ω~25KΩ	100Ω~25KΩ		$\pm 5 \text{ PPM/}^\circ\text{C}$
					50Ω~200KΩ	50Ω~200KΩ	50Ω~200KΩ		$\pm 10 \text{ PPM/}^\circ\text{C}$
					4.7Ω~1MΩ	1Ω~1MΩ	1Ω~1MΩ		$\pm 25 \text{ PPM/}^\circ\text{C}$
					4.7Ω~1MΩ	1Ω~1MΩ	1Ω~1MΩ		$\pm 50 \text{ PPM/}^\circ\text{C}$
TC10	1/4W	-55°C~+155°C	150V	300V	100Ω~25KΩ	100Ω~25KΩ	100Ω~25KΩ		$\pm 5 \text{ PPM/}^\circ\text{C}$
					50Ω~200KΩ	50Ω~200KΩ	50Ω~200KΩ		$\pm 10 \text{ PPM/}^\circ\text{C}$
					4.7Ω~1MΩ	1Ω~1MΩ	1Ω~1MΩ		$\pm 25 \text{ PPM/}^\circ\text{C}$
					4.7Ω~1MΩ	1Ω~1MΩ	1Ω~1MΩ		$\pm 50 \text{ PPM/}^\circ\text{C}$
TC12	1/2W	-55°C~+155°C	150V	300V	100Ω~25KΩ	100Ω~25KΩ	100Ω~25KΩ		$\pm 5 \text{ PPM/}^\circ\text{C}$
					50Ω~200KΩ	50Ω~200KΩ	50Ω~200KΩ		$\pm 10 \text{ PPM/}^\circ\text{C}$
					4.7Ω~1MΩ	1Ω~1MΩ	1Ω~1MΩ		$\pm 25 \text{ PPM/}^\circ\text{C}$
					4.7Ω~1MΩ	1Ω~1MΩ	1Ω~1MΩ		$\pm 50 \text{ PPM/}^\circ\text{C}$

Feature (特性)

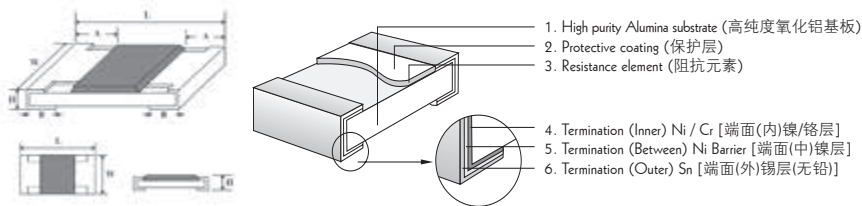
- Thin film Ni/Cr Resistance element 薄膜镍铬阻抗元件
- High power & Low noise 高功率, 低噪声
- Extremely low TCR from (低温度系数)
 $\pm 25\text{PPM}/^{\circ}\text{C}$, $\pm 50\text{PPM}/^{\circ}\text{C}$
- Totally Lead-free 完全无铅产品

Application (应用)

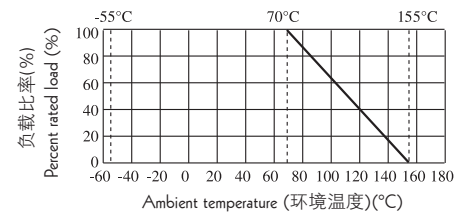
- Control circuit V.C.R V.C.R 控制电路
- Air-conditioner 空调器
- Computer, color TV 电脑, 电视
- Facsimile 传真机



Figures (型状)



Derating Curve (降功率曲线)



Type 类型	L (mm)	W (mm)	H (mm)	A (mm)	B (mm)
TP03	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20
TP05	2.00±0.15	1.25 ^{+0.15} _{-0.10}	0.55±0.10	0.40±0.20	0.40±0.20
TP06	3.10±0.15	1.55 ^{+0.15} _{-0.10}	0.55±0.10	0.45±0.20	0.45±0.20
TP07	3.10±0.10	2.60±0.20	0.55±0.10	0.45±0.20	0.45±0.20
TP10	5.00±0.10	2.50±0.20	0.55±0.10	0.60±0.25	0.50±0.20
TP12	6.35±0.10	3.20±0.20	0.55±0.10	0.60±0.25	0.50±0.20

Characteristics (特性)

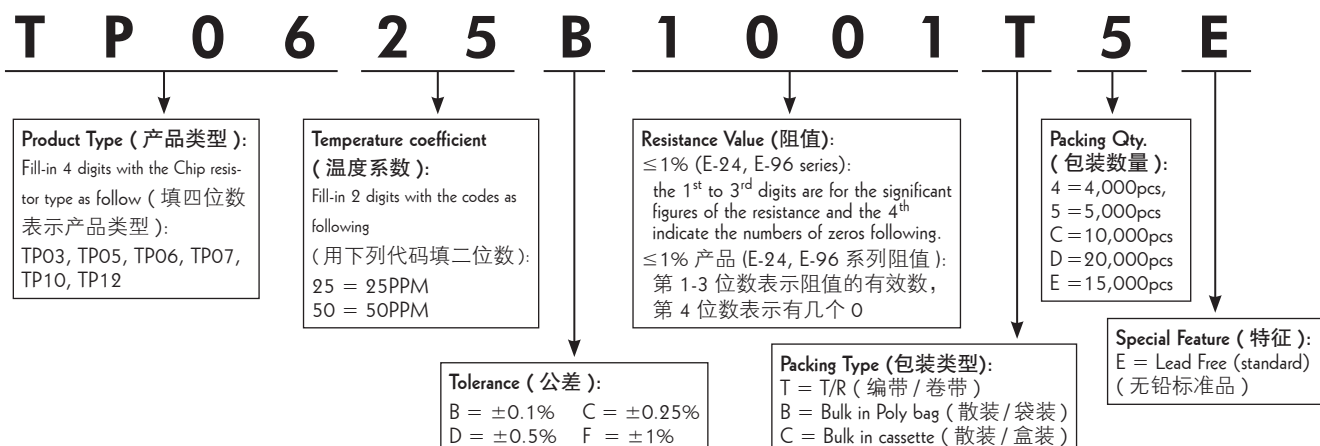
Type 类型	Power Rating 功率 at 70°C	Operating Temperature 工作温度范围	Max. Working Voltage 最大工作电压	Max. Overload Voltage 最大过负荷电压	Resistance Range 阻值范围				TCR 温度系数 PPM/°C
					±0.10%	±0.25%	±0.5%	±1%	
TP03	1/10W, 1/6W-S	-55°C~+155°C	75V	150V	4.7Ω~1MΩ	1.5Ω~1MΩ	1Ω~1MΩ	1Ω~1MΩ	±25 / ±50
TP05	1/8W, 1/4W-S	-55°C~+155°C	150V	300V	4.7Ω~1MΩ	1Ω~1MΩ	1Ω~1MΩ	1Ω~1MΩ	±25 / ±50
TP06	1/4W, 1/3W-S	-55°C~+155°C	200V	400V	4.7Ω~1MΩ	1Ω~1MΩ	1Ω~1MΩ	1Ω~1MΩ	±25 / ±50
TP07	1/3W	-55°C~+155°C	200V	400V	4.7Ω~1MΩ	1Ω~1MΩ	1Ω~1MΩ	1Ω~1MΩ	±25 / ±50
TP10	1/2W	-55°C~+155°C	200V	400V	4.7Ω~1MΩ	1Ω~1MΩ	1Ω~1MΩ	1Ω~1MΩ	±25 / ±50
TP12	1W	-55°C~+155°C	200V	400V	10Ω~1MΩ	10Ω~1MΩ	10Ω~1MΩ	10Ω~1MΩ	±25 / ±50

Performance Specification (性能)

Short-time overload 短时间过负荷	ΔR ≤ ±0.5%	Humidity (Steady State) 恒定湿热	ΔR ≤ ±0.3%
Insulation Resistance 绝缘电阻	≥ 1,000MΩ	Terminal bending 端子弯曲	ΔR ≤ ±0.2%
Load life 负载寿命	ΔR ≤ ±0.2% > 7KΩ ΔR ≤ ±0.5%	Solderability 可焊性	Min 95% coverage (最少 95% 覆盖率)
		Soldering heat 耐焊接热	ΔR ≤ ±0.2%

Ordering Procedure (Example: High Power Thin Film TP06 1/4W 0.1% 25PPM 1KΩ T/R-5000)

订购方式 (例如: 高功率薄膜 TP06 1/4W 0.1% 25PPM 1KΩ T/R-5000)



Feature (特性)

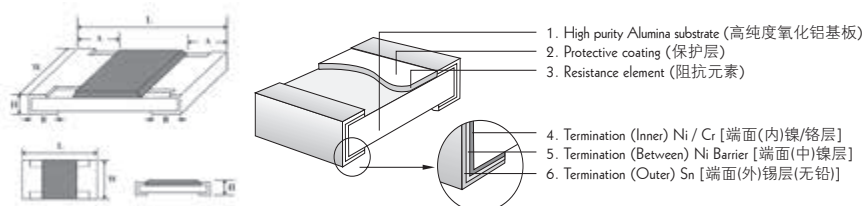
- Thin film Ni/Cr Resistance element
薄膜镍铬阻抗元件
- Extremely low TCR from (低温度系数)
 $\pm 50\text{PPM}/^\circ\text{C}$
- Totally Lead-free 完全无铅产品
- Low noise 低噪声

Application (应用)

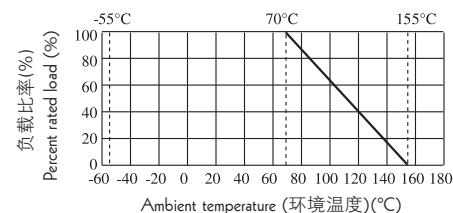
- Control circuit V.C.R V.C.R 控制电路
- Air-conditioner 空调器
- Computer, color TV 电脑, 电视
- Facsimile 传真机



Figures (型状)



Derating Curve (降功率曲线)



Type 类型	L (mm)	W (mm)	H (mm)	A (mm)	B (mm)
TC03	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20
TC05	2.00±0.15	1.25 ^{+0.15} _{-0.10}	0.55±0.10	0.40±0.20	0.40±0.20
TC06	3.10±0.15	1.55 ^{+0.15} _{-0.10}	0.55±0.10	0.45±0.20	0.45±0.20

Characteristics (特性)

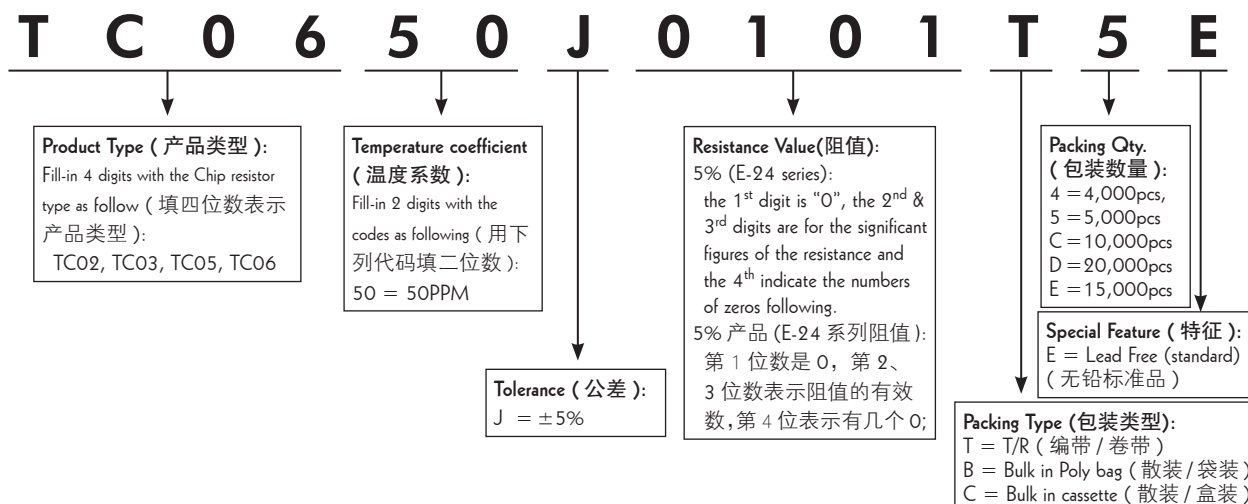
Type 类型	Power Rating 功率 at 70°C	Max. Working Voltage 最大工作电压	Max. Overload Voltage 最大过负荷电压	Resistance Range 阻值范围	Tolerance 公差	Operating Temperature 工作温度范围	T.C.R 温度系数 (PPM/°C)
TC03	1/16W, 1/10W-S	50V	100V	10Ω~330Ω	±5%	-55°C~+155°C	±50PPM/°C
TC05	1/10W, 1/8W-S	150V	300V				
TC06	1/8W, 1/4W-S	200V	400V				

Performance Specification (性能)

Short-time overload 短时间过负荷	ΔR ≤ ±2%	Terminal bending 端子弯曲	ΔR ≤ ±1%
Insulation Resistance 绝缘电阻	≥ 1,000MΩ	Solderability 可焊性	Min 95% coverage (最少 95% 覆盖率)
Load life 负载寿命	ΔR ≤ ±3%	Soldering heat 耐焊接热	ΔR ≤ ±1%
Humidity (Steady State) 恒定湿热	ΔR ≤ ±3%		

Ordering Procedure (Example: Thin Film TC06 1/8W 5% 50PPM 100Ω T/R-5000)

订购方式 (例如: TC06 1/8W 5% 50PPM 100Ω T/R-5000)



Feature (特性)

- High density, more than 1 resistors in one small case 高度密集, 多个电阻在一个表贴封装中
- Improvement of placement efficiency 装配效率高
- Tape/Reel packaging is suitable for automatic placement machine 编带卷装适合自动化机器
- Superior solderability 优越焊接性
- Application: Master board, CD & DVD Rom, Hard Disk, RAM
应用于 CD、DVD、硬盘、内存、主板等



	2D02	4D02	2D03	4D03 (4DP3)	16P8
Dimension 规格 (mm)					
Equivalent Circuit Diagram 等效 电路图					

Type (类型)	2D02	4D02	2D03	4D03	4DP3	16P8
Rated power (功率) 70°C	1/16W	1/16W	1/16W	1/16W	1/10W	1/16W
Max. Working Voltage 最大工作电压	50V	50V	50V	50V	50V	50V
Max. Overload Voltage 最大过负荷电压	100V	100V	100V	100V	100V	100V
Dielectric Withstanding Voltage 绝缘耐压	100V	100V	100V	300V	300V	300V
Resistance Range 阻值范围	5% (E-24): 10Ω~1MΩ 1% (E-96): 10Ω~1MΩ	5% (E-24): 10Ω~1MΩ 1% (E-96): 10Ω~1MΩ	5% (E-24): 10Ω~1MΩ 1% (E-96): 10Ω~1MΩ	5% (E-24): 1Ω~1MΩ 1% (E-96): 1Ω~1MΩ	5% (E-24): 1Ω~1MΩ 1% (E-96): 1Ω~1MΩ	5% (E-24): 1Ω~1MΩ 1% (E-96): 1Ω~1MΩ
Temperature Coefficient 温度系数 PPM/°C	±200	±200	±200	≥10Ω: ±200 <10Ω: ±400	≥10Ω: ±200 <10Ω: ±400	≥10Ω: ±200 <10Ω: ±400
Operating Temperature 工作温度范围	-55°C~+155 °C	-55°C~+155 °C	-55°C~+155 °C	-55°C~+155 °C	-55°C~+155 °C	-55°C~+155 °C
Resistance Value of Jumper 零欧姆电阻阻值	<50mΩ	<50mΩ	<50mΩ	<50mΩ	<50mΩ	<50mΩ
Rated Current of Jumper 零欧姆电阻额定电流	1A	1A	1A	1A	1A	1A

Performance Specification (性能)

Short-time overload	短时间过负荷	±(2.0% ±0.1Ω) Max.(最大)
Insulation resistance	绝缘电阻	≥1,000MΩ
Dielectric withstanding voltage	绝缘耐压	No evidence of flashover, mechanical damage, arcing or insulation breakdown 无击穿, 飞弧及可见机械性损伤
Terminal bending	端子弯曲	±(1.0% ±0.05Ω) Max.(最大)
Soldering heat	耐焊接热	ΔR/R ≤ ±(1.0% ±0.05Ω)
Solderability	可焊性	Min. 95% coverage (最少 95% 覆盖率)
Temperature cycling	温度循环	ΔR/R ≤ ±(1.0% ±0.05Ω)
Load lie in humidity	湿度寿命	±(3.0% ±0.1Ω) Max.(最大)
Load life	负载寿命	±(3.0% ±0.1Ω) Max.(最大)

- Please refer to page 5 for the information of Ordering Procedure (Part No.)

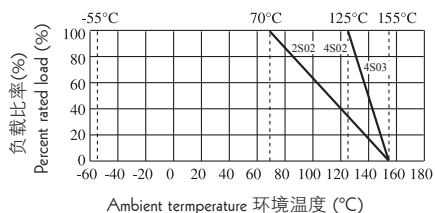
订购方式, 请参考第 5 页 (料号)

Feature (特性)

- Anti-Sulfidation 抗硫化
- Suitable for reflow & wave soldering 适合波峰焊与回流焊
- Application car, power 适用于汽车、电源等



Derating Curve (降功率曲线)



Dimension (mm) & Conformation [尺寸(mm)与结构]

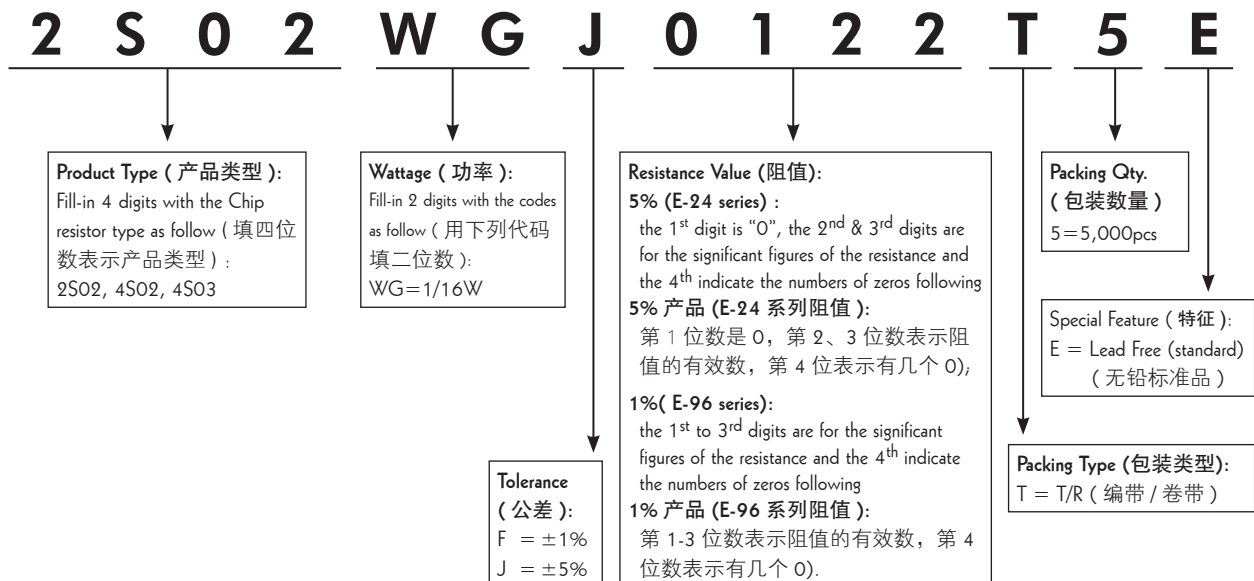
	2S02	4S02	4S03
Dimension 规格 (mm)			
Equivalent Circuit Diagram 等效电路图	R1=R2	R1=R2=R3=R4	R1=R2=R3=R4

Characteristics (特性)

Type 类型	Power Rating 功率 at 70°C	Max. Working Voltage 最大工作 电压	Max. Overload Voltage 最大过负荷 电压	Resistance Range 阻值范围	Dielectric Withstanding Voltage 绝缘耐压	Tolerance 公差	Operating Temperature 工作温度范围	Resistance Value of Jumper 零欧姆电阻 阻值	Rated Current of Jumper 零欧姆电阻 额定电流	T.C.R 温度系数 (PPM/°C)
2S02	1/16W	50V	100V	10Ω~10MΩ	100	±1%, ±5%	-55°C~+155°C	<50mΩ	1A	±200
4S02				10Ω~10MΩ	100					±200
4S03				1Ω~1MΩ	300					≥10Ω: ±200 <10Ω: ±400

Performance Specification (性能)

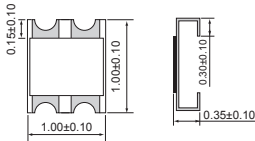
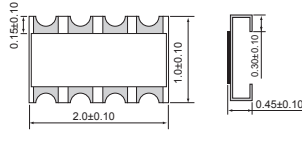
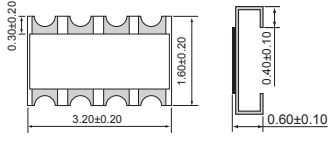
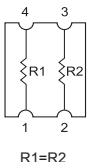
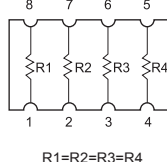
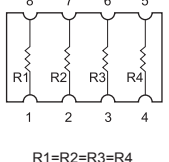
试验项目 Test Item	试验方法 Test Methods	判定标准 Determine Specification
短时间过负荷 Short-time overload	2.5 倍额定电压或最大过负荷电压 (取其低者), 持续 5 秒钟, 然后测阻值。 2.5x Rated voltage or Max. Overload Voltage whichever is lower for 5 seconds, then check the resistance.	$\pm(2.0\%+0.1\Omega)$ Max (最大)
端子弯曲 Terminal Bending	弯曲距离 (Bending Distance):5mm, 保持时间: 60s $\pm$ 5s, 然后测试阻值。 Duration:60s $\pm$ 5s, then check the resistance.	$\pm(1.0\%+0.05\Omega)$ Max (最大)
可焊性 Solderability	245 $\pm$ 3 $^{\circ}$ C, 2~3 秒 245 $\pm$ 3 $^{\circ}$ C, 2~3s	覆盖率 $\geq$ 95% 95% coverage Min
耐焊接热 Soldering heat	260 $\pm$ 5 $^{\circ}$ C, 10 $\pm$ 1 秒 260 $\pm$ 5 $^{\circ}$ C, 10 $\pm$ 1s	$\pm(1.0\%+0.05\Omega)$ Max (最大)
耐湿性 Moisture Resistance	25 $^{\circ}$ C~65 $^{\circ}$ C,90~100%RH, 2.5 小时; 65 $^{\circ}$ C 90~100%RH, 3 小时; 65 $^{\circ}$ C~25 $^{\circ}$ C,80~100%RH, 2.5 小时,10 个循环, 试验结束 24 小时后进行测试。 25 $^{\circ}$ C~65 $^{\circ}$ C,90~100%RH, 2.5H; 65 $^{\circ}$ C 90~100%RH, 3H; 65 $^{\circ}$ C~25 $^{\circ}$ C 80~100%RH, 2.5H, 10 cycles, Measurement at 24 hours after test conclusion MIL-STD-202 Method 106	$\pm(3.0\%+0.1\Omega)$ Max (最大)
偏置湿度 Biased Humidity	10% 额定功率,85 $^{\circ}$ C/85%RH, 持续通电 1000 小时, 试验结束 24 小时后进行测试。 10% rated power ,85 $^{\circ}$ C/85%RH, 1000H,Measurement at 24 hours after test conclusion MIL-STD-202 Method 103	$\pm(3.0\%+0.1\Omega)$ Max (最大)
绝缘耐压 Dielectric withstanding voltage	电阻固定在 90 $^{\circ}$ C 的 V 型槽中, 根据不同产品规定交流电压, 持续 60~70 秒。Resistor shall be clamped in the trough of 90 $^{\circ}$ C metallic V-block and shall be tested at AC potential respectively specified in the given list of each product type for 60~70s.	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	-55 $\pm$ 3 $^{\circ}$ C(30 分钟)~室温(10-15 分钟)~155 $\pm$ 2 $^{\circ}$ C(30 分钟)~室温(10~15 分钟) 1000 个循环, 试验结束 24 小时后进行测试。 -55 $\pm$ 3 $^{\circ}$ C 30min ~normal temperature 10min-15min~155 $\pm$ 2 $^{\circ}$ C 30min~normal temperature 10min-15min1000 cycles, Measurement at 24 hours after test conclusion. JESD22 Method JA-104	$\pm(1.0\%+0.1\Omega)$ Max (最大)
负载寿命 Load life	2S02, 4S02: 125 $^{\circ}$ C, 35% 功率, 4S03: 125 $^{\circ}$ C, 100% 功率, 试验结束 24 小时后进行测试。 2S02, 4S02: 125 $^{\circ}$ C, 35% power, 4S03: 125 $^{\circ}$ C, 100% power, Measurement at 24 $\pm$ 2 hours after test conclusion. MIL-STD-202 Method 108	$\pm(3.0\%+0.1\Omega)$ Max (最大)
硫化测试 Sulfuration test	H ₂ S 1000ppm, 25 $^{\circ}$ C $\pm$ 2 $^{\circ}$ C 90%RH, 720H	$\Delta R \leq \pm(0.5\%+0.1\Omega)$

Ordering Procedure (Example: 2S02 1/16W $\pm$ 5%1.2K T/R-5000)订购方式 (例如: 2S02 1/16W $\pm$ 5%1.2K T/R-5000)

Feature (特性)

- High density, more than 1 resistors in one small case 高度密集，多个电阻在一个表贴封装中
- The Concave design in terminal enlarge the Soldering plate area 内凹设计，扩大端头锡焊面积
- The Concave design to reduce the terminal breaking risk 内凹设计，防止端头断裂
- Improvement of placement efficiency 装配效率高
- Application: RAM, CD & DVD Rom, Hard Disk, Master board
应用于CD、DVD、硬盘、内存、主板等



	2C02	4C02	4C03
Dimension 规格 (mm)			
Equivalent Circuit Diagram 等效 电路图	 R1=R2	 R1=R2=R3=R4	 R1=R2=R3=R4

Type (类型)	2C02	4C02	4C03
Rated power (功率) 70°C	1/16W	1/16W	1/16W, 1/10W-S
Max. Working Voltage 最大工作电压	50V	50V	50V
Max. Overload Voltage 最大过负荷电压	100V	100V	100V
Dielectric Withstanding Voltage 绝缘耐压	100V	100V	300V
Resistance Range 阻值范围	5% (E-24): 10Ω~1MΩ 1% (E-96): 10Ω~1MΩ	5% (E-24): 10Ω~1MΩ 1% (E-96): 10Ω~1MΩ	5%, 1%: 1Ω~1M
Temperature Coefficient 温度系数	±200PPM/°C	±200PPM/°C	≥10Ω: ±200PPM/°C <10Ω: ±400PPM/°C
Operating Temperature 工作温度范围	-55°C~+155°C	-55°C~+155 °C	-55°C~+155 °C
Resistance Value of Jumper 零欧姆电阻阻值	<50mΩ	<50mΩ	<50mΩ
Rated Current of Jumper 零欧姆电阻额定电流	1A	1A	1A

Performance Specification (性能)

Short-time overload	短时间过负荷	±(2.0% ±0.1Ω) Max.(最大)
Insulation resistance	绝缘电阻	≥1,000MΩ
Dielectric withstanding voltage	绝缘耐压	No evidence of falshover, mechanical damage, arcing or insulation breakdown 无击穿，飞弧及可见机械性损伤
Terminal bending	端子弯曲	±(1.0% ±0.05Ω) Max. (最大)
Soldering heat	耐焊接热	ΔR/R ≤ ±(1.0% ±0.05Ω)
Solderability	可焊性	Min. 95% coverage (最少 95% 覆盖率)
Temperature cycling	温度循环	ΔR/R ≤ ±(1.0% ±0.05Ω)
Load life in humidity	湿度寿命	±(3.0% ±0.1Ω) Max.(最大)
Load life	负载寿命	±(3.0% ±0.1Ω) Max.(最大)

- Please refer to page 5 for the information of Ordering Procedure (Part No.)

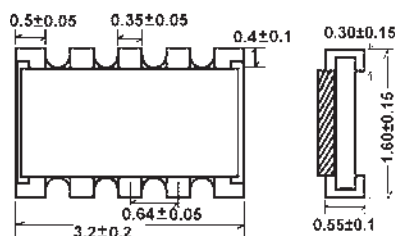
订购方式，请参考第5页（料号）

Feature (特性)

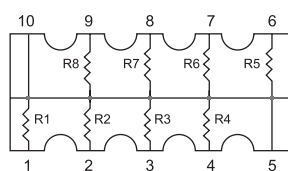
- High density, more than 1 resistors in one small case 高度密集, 多个电阻在一个表贴封装中
- Improvement of placement efficiency 装配效率高
- Tape/Reel packaging is suitable for automatic placement machine 编带卷装适合自动化机器
- Superior solderability 优越焊接性



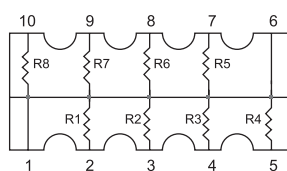
Dimension (尺寸) (mm)



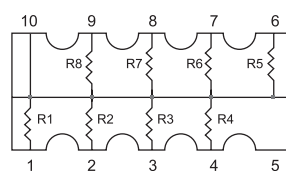
Equivalent Circuit Diagram (等效电路图)



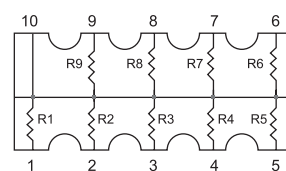
R1=R2=R3=R4=R5=R6=R7=R8
10P8 (P Type)



R1=R2=R3=R4=R5=R6=R7=R8
10S8 (S Type)



R1=R2=R3=R4=R5=R6=R7=R8
10T8 (T Type)



R1=R2=R3=R4=R5=R6=R7=R8=R9
10E9 (E Type)

Performance Specification (性能)

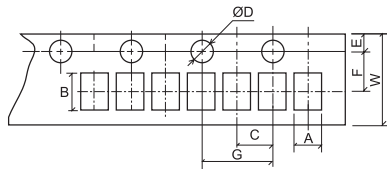
Rated Power at 70°C	功率	1/32W [1/16W special provide (可特别提供)]
Max. Working Voltage	最大工作电压	25V
Max. Overload Voltage	最大过负荷电压	50V
Dielectric withstanding Voltage	绝缘耐压	50V
Operating temperature	工作温度	-55°C ~ +155 °C
Resistance Range	阻值范围	5%(E-24 series) & 1%(E-24,E-96 series): 10Ω~1MΩ 5%(E-24 系列) & 1%(E-24,E-96 系列): 10Ω~1MΩ
Resistance Value of Jumper	零欧姆电阻阻值	<50mΩ
Rated Current of Jumper	零欧姆电阻额定电流	0.5A

Temperature Coefficient	温度系数	±200PPM/°C
Short-time overload	短时间过负荷	±(2.0% ±0.05Ω) Max.(最大)
Insulation resistance	绝缘电阻	≥1,000MΩ
Dielectric withstanding voltage	绝缘耐压	No evidence of flashover, mechanical damage, arcing or insulation breakdown 无击穿, 飞弧及可见机械性损伤
Terminal bending	端子弯曲	±(1.0% ±0.05Ω) Max.(最大)
Soldering heat	耐焊接热	ΔR/R ≤ ±(1.0% ±0.05Ω)
Solderability	可焊性	Min.95% coverage (最少 95% 覆盖率)
Load life in humidity	湿度寿命	±(3.0% ±0.1Ω) Max.(最大)
Load life	负载寿命	±(3.0% ±0.1Ω) Max.(最大)

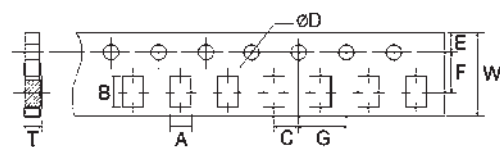
• Please refer to page 5 for the information of Ordering Procedure (Part No.)

订购方式, 请参考第 5 页 (料号)

Dimension of Paper Taping (纸带尺寸)(mm)

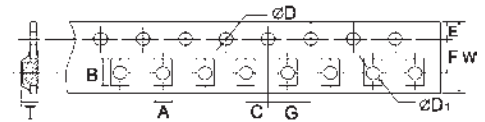


01005 0201 0402 HP02 HQ02 NM02 TC02 2C02 4C02 4D02 2D02



0603 0805 1206 1210 2010 0508 0612 1020 HQ03 HQ05 HQ06 HQ07 HQ10 HP03 HP05 HP06 HP07 HP10
HV03 HV05 HV06 HV07 HV10 NM03 NM05 NS03 NS05 NS06 AS03 AS05 AS06 PS05 PS06 PS07 CS03 CS05
CS06 CS07 CS10 TC03 TC05 TC06 TC07 TR05 TR06 TP03 TP05 TP06 4D03 4C03 10P8 10S8 10T8 10E9 16P8

Type (类型)	A±0.2	B±0.2	C±0.05	ØD ^{+0.1} ₀	E±0.1	F±0.05	G±0.1	W±0.2	T±0.1
01005	0.24±0.05	0.45±0.05	2.0	1.5	1.75	3.5	4.0	8.0	0.40
0201, ES01, NS01	0.40±0.05	0.70±0.05	2.0	1.5	1.75	3.5	4.0	8.0	0.42
0402, CS02, CQ02, ES02, HP02, HQ02, LT02, NM02, TC02, PS02	0.65	1.15	2.0	1.5	1.75	3.5	4.0	8.0	0.45
0603, AS03, CQ03 CS03, ES03, HP03, HQ03, HV03, LT03 NM03, NS03, PS03, TC03, TP03	1.10	1.90	2.0	1.5	1.75	3.5	4.0	8.0	0.67
0508, 0805, AS05, CQ05, CS05, ES05, HP05, HQ05, HV05, LE05, LT05, NM05 NS05 PS05, TC05, TR05, TP05,	1.65	2.40	2.0	1.5	1.75	3.5	4.0	8.0	0.81
0612, 1206, AS06, CQ06, CS06, ES06, HP06, HQ06, HV06 LT06, NS06, PS06 TC06, TR06, TP06	2.00	3.60	2.0	1.5	1.75	3.5	4.0	8.0	0.81
1210, CQ07, CS07, ES07, HP07, HQ07, HV07, PS07, TC07, TP07	2.80	3.50	2.0	1.5	1.75	3.5	4.0	8.0	0.75
2010, AS10, CQ10, CS10, HP10, HQ10, HV10, PS10, 1020,	2.80	5.40	2.0	1.5	1.75	5.5	4.0	12.0	0.75
2D02, 2C02, 2S02	1.20	1.20	2.0	1.5	1.75	3.5	4.0	8.0	0.45
4D02, 4C02, 4S02	1.20	2.20	2.0	1.5	1.75	3.5	4.0	8.0	0.70
2D03	1.90	1.90	2.0	1.5	1.75	3.5	4.0	8.0	0.83
4D03, 4C03, 4S03	2.00	3.60	2.0	1.5	1.75	3.5	4.0	8.0	0.83
10P8, 10S8, 10T8, 10E9	2.00	3.60	2.0	1.5	1.75	3.5	4.0	8.0	0.85
16P8	1.80	4.30	2.0	1.5	1.75	5.5	4.0	12.0	0.75

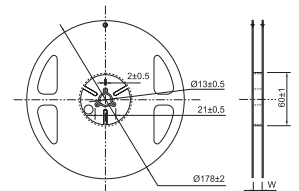


Dimension of Embossed Taping (塑胶带尺寸)(mm)

Type (类型)	A±0.2	B±0.2	C±0.05	ØD ^{+0.1} ₀	ØD ₁ ^{+0.25} ₀	E±0.1	F±0.05	G±0.1	W±0.2	T±0.1
TC10, TP10	2.9	5.6	2.0	1.5	1.5	1.75	5.5	4.0	12	1.0
1218, 1812, CS11, HP11	3.5	4.8	2.0	1.5	1.5	1.75	5.5	4.0	12	1.0
1225, 2512, AS12, CS12, CQ12, HP12, HQ12, HV12, PS12, TC12, TP12	3.5	6.7	2.0	1.5	1.5	1.75	5.5	4.0	12	1.0

Dimension of Reel (卷轴尺寸)(mm)

Type (类型)	Tape 编带	Qty. / Reel 数量 / 卷装	Tape Width 纸带宽	W±1
01005	Paper 纸带	20,000pcs	8mm	10
0201, 0402*, CS02, CQ02, ES01, ES02, HP02, HQ02, LT02, NM02, TC02, PS02	Paper 纸带	10,000pcs*	8mm	10
0603, AS03, CQ03, CS03, ES03, HP03, HQ03, HV03, LT03, NM03 NS03, PS03, TC03, TP03	Paper 纸带	5,000pcs	8mm	10
0508, 0805, AS05, CQ05, CS05, ES05, HP05, HQ05, HV05 LE05, LT05, NM05, NS05, PS05, TC05, TR05, TP05	Paper 纸带	5,000pcs	8mm	10
0612, 1206, AS06, CQ06, CS06, ES06, HP06, HQ06, HV06 LT06, NS06, PS06, TC06, TR06, TP06	Paper 纸带	5,000pcs	8mm	10
1210, CS07, CQ07, ES07, HP07, HQ07, HV07, PS07, TC07, TP07	Paper 纸带	5,000pcs	8mm	10
1020, 2010, AS10, CQ10, CS10, HP10, HQ10, HV10, PS10	Paper 纸带	4,000pcs	12mm	13.8
1218, 1812, CS11, HP11, TC10, TP10	Embossed 塑胶带	4,000pcs	12mm	13.8
1225, 2512, AS12, CQ12, CS12, HP12, HQ12, HV12, PS12, TC12, TP12	Embossed 塑胶带	4,000pcs	12mm	13.8
2D02, 2C02, 2S2	Paper 纸带	10,000pcs	8mm	10
4D02, 4C02, 4S02	Paper 纸带	10,000pcs	8mm	10
2D03, 4D03, 4C03, 4S03	Paper 纸带	5,000pcs	8mm	10
10P8, 10S8, 10T8, 10E9	Paper 纸带	5,000pcs	8mm	10
16P8	Paper 纸带	4,000pcs	12mm	13.8



*Remark: 15,000 pcs/reel package could be offered for 0402 size. (备注: 0402 可提供 15,000 只包装)

Dimension of Bulk Cassette (散装箱尺寸) (mm)

36(H)×12(W)×110(L)

Bulk Cassette packing available on a case to case basis (散装可特别提供)

