

### Feature (特性)

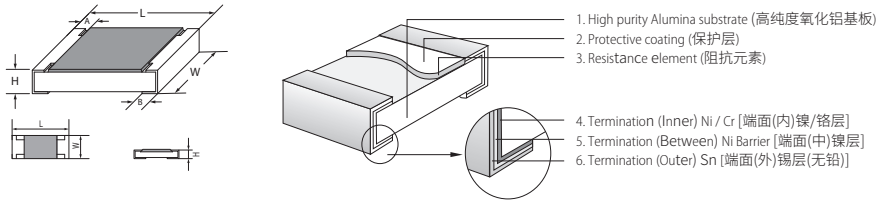
- Thin film NiCr Resistance element  
薄膜镍铬阻抗组件
- Very tight tolerance  $\pm 0.05\% \sim \pm 1\%$   
高精密的公差  $\pm 0.05\% \sim \pm 1\%$
- Extremely low TCR  $\pm 5\text{ppm} \sim \pm 50\text{ppm}$   
极低的温度系数  $\pm 5\text{ppm} \sim \pm 50\text{ppm}$
- Completed Lead-free 完全无铅产品

### Application (应用)

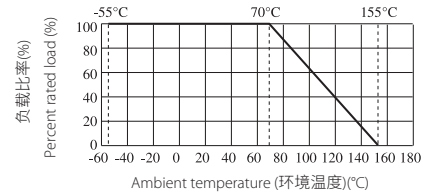
- Automotive 汽车电子
- Automatic equipment 自动化设备
- Communication & telecom 通信终端及设备
- Industrial 工业电子
- Medical Equipment 医疗器材



### Figures (型状)



### Derating Curve (降功率曲线)



Type 类型	Size 尺寸	L (mm)	W (mm)	H (mm)	A (mm)	B (mm)
TC02	0402 (1005)	1.00±0.10	0.50±0.05	0.35±0.05	0.2±0.1	0.25±0.10
TC03	0603 (1608)	1.60±0.10	0.80±0.10	0.45±0.10	0.3±0.2	0.30±0.20
TC05	0805 (2012)	2.00±0.15	1.25 <sup>+0.15</sup> <sub>-0.10</sub>	0.55±0.10	0.3±0.2	0.40±0.20
TC06	1206 (3216)	3.10±0.15	1.55 <sup>+0.15</sup> <sub>-0.10</sub>	0.55±0.10	0.4±0.2	0.45±0.20
TC07	1210 (3225)	3.10±0.10	2.60±0.20	0.55±0.10	0.4±0.2	0.45±0.20
TC10	2010 (5025)	5.00±0.10	2.50±0.20	0.55±0.10	0.5±0.25	0.50±0.20
TC12	2512 (6432)	6.35±0.10	3.20±0.20	0.55±0.10	0.5±0.25	0.50±0.20

### Performance Specifications (性能)

Test Item 试验项目	Test Methods 试验方法	Evaluation Criteria 判定标准
Short-time overload 短时间过负荷	2.5x Rated voltage or Max. Overload Voltage whichever is lower for 5 seconds, then check the resistance. 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	$\Delta R \leq \pm 0.5\%$
Insulation resistance 绝缘电阻	1. Chip Resistor: the measuring voltage shall be, measured with a direct voltage of (100±15)V or a voltage equal to the dielectric withstanding voltage, and apply for 1 min. 2. TH Resistor: the measuring voltage shall be equal to the dielectric withstanding voltage for resistor with an isolation voltage < 500V or (500±50)V DC, for resistors with an isolation voltage ≥ 500V. 1. 贴片电阻: 绝缘耐压 < 100V, 测试电压取绝缘耐压的电压; 绝缘耐压 ≥ 100V, 测试电压为 100±15VDC, 1 分钟后量测阻值。 2. 插件电阻: 绝缘耐压 < 500V, 测试电压取绝缘耐压的电压; 绝缘耐压 ≥ 500V, 测试电压为 500±50VDC, 1 分钟后量测阻值。	≥ 1,000MΩ
Load life in humidity 湿度寿命	Resistance change after 1000 hours (1.5hours "ON", 0.5hours "OFF") at RCWV or Max.Working Voltage whichever less in a humidity test chamber controlled at 40±2°C and 90~95% RH. 持续时间: 1000h (1.5h "通", 0.5h "断"); 试验温度: 40±2°C; 相对湿度: 90~95% RH; 试验电压: 额定工作电压或最大工作电压 (取其低者)。	$\Delta R \leq \pm 0.5\%$
Load life 负载寿命	Permanent Resistance change after 1000 hours operating at RCWV or Max.Working Voltage whichever less with duty cycle of 1.5 hours "ON", 0.5 hour "OFF" at 70±2°C ambient. 持续时间: 1000h (1.5h "通", 0.5h "断"); 试验温度: 70±2°C; 试验电压: 额定工作电压或最大工作电压 (取其低者)。	$\Delta R \leq \pm 0.2\%$ > 7KΩ: $\Delta R \leq \pm 0.5\%$
Humidity (Steady State) 恒定湿热	Temporary resistance change after 240 hours exposure in a humidity test chamber controlled at 40±2°C and 90~95% RH. 在 40±2°C 和 90~95% RH 相对湿度条件下, 存放 240h 后阻值变化率。	$\Delta R \leq \pm 0.3\%$
Terminal bending 端子弯曲	(Applicable for CHIP Resistors 适用晶片电阻) Twist of Test Board: Y/X=3/90mm 60 seconds. 测试板弯曲: Y/X=3/90mm 60 秒。	$\Delta R \leq \pm 0.2\%$
Solderability 可焊性	The area covered with a new, smooth, clean, shiny and continuous surface free from concentrated pinholes. Temperature of solder: 245±3°C; Dwell time in solder: 2~3 seconds. 表面光滑、清洁、均匀、有光泽, 锡炉温度: 245±3°C; 浸入时间: 2~3 秒。	Coverage must be over 95%.
Soldering heat 耐焊接热	Dip the resistor into a temperature of 260±5°C and hold it for a 10±1 seconds. 将电阻浸入到 260±5°C 的锡炉中并保持 10 秒时间。	$\Delta R \leq \pm 0.2\%$

### Electrical Data (电气参数)

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	Dielectric With-standing Voltage 绝缘耐压	Resistance Range 阻值范围			TCR 温度系数
						±0.01% ±0.05%	±0.1% ±0.25%	±0.5%	
TC02	1/16W	-55°C~+155°C	25V	50V	100V	/	100Ω~2KΩ	100Ω~2KΩ	±5PPM/°C
						/	50Ω~12KΩ	50Ω~12KΩ	±10PPM/°C
						/	10Ω~332KΩ	10Ω~332KΩ	±25PPM/°C
						/	10Ω~332KΩ	10Ω~332KΩ	±50PPM/°C
TC03	1/10W	-55°C~+155°C	75V	150V	300V	/	100Ω~4KΩ	100Ω~4KΩ	±5PPM/°C
						/	10Ω~50KΩ	10Ω~50KΩ	±10PPM/°C
						4.7Ω~332K	4.7Ω~1MΩ	1Ω~1MΩ	±25PPM/°C
						4.7Ω~332K	4.7Ω~1MΩ	1Ω~1MΩ	±50PPM/°C
TC05	1/8W	-55°C~+155°C	150V	300V	500V	/	100Ω~15KΩ	100Ω~15KΩ	±5PPM/°C
						/	10Ω~100KΩ	10Ω~100KΩ	±10PPM/°C
						4.7Ω~511K	4.7Ω~2MΩ	1Ω~2MΩ	±25PPM/°C
						4.7Ω~511K	4.7Ω~2MΩ	1Ω~2MΩ	±50PPM/°C
TC06	1/4W	-55°C~+155°C	200V	400V	500V	/	100Ω~15KΩ	100Ω~15KΩ	±5PPM/°C
						/	10Ω~200KΩ	10Ω~200KΩ	±10PPM/°C
						4.7Ω~1M	4.7Ω~3MΩ	1Ω~3MΩ	±25PPM/°C
						4.7Ω~1M	4.7Ω~3MΩ	1Ω~3MΩ	±50PPM/°C
TC07	1/3W	-55°C~+155°C	200V	400V	500V	/	100Ω~15KΩ	100Ω~15KΩ	±5PPM/°C
						/	10Ω~200KΩ	10Ω~200KΩ	±10PPM/°C
						4.7Ω~1M	4.7Ω~3MΩ	1Ω~3MΩ	±25PPM/°C
						4.7Ω~1M	4.7Ω~3MΩ	1Ω~3MΩ	±50PPM/°C
TC10	1/3W	-55°C~+155°C	200V	400V	500V	/	100Ω~25KΩ	100Ω~25KΩ	±5PPM/°C
	1/2W					/	50Ω~200KΩ	50Ω~200KΩ	±10PPM/°C
						4.7Ω~1M	4.7Ω~3MΩ	1Ω~3MΩ	±25PPM/°C
						4.7Ω~1M	4.7Ω~3MΩ	1Ω~3MΩ	±50PPM/°C
TC12	3/4W	-55°C~+155°C	200V	400V	500V	/	100Ω~25KΩ	100Ω~25KΩ	±5PPM/°C
						/	50Ω~200KΩ	50Ω~200KΩ	±10PPM/°C
						10Ω~1M	4.7Ω~3MΩ	1Ω~3MΩ	±25PPM/°C
						10Ω~1M	4.7Ω~3MΩ	1Ω~3MΩ	±50PPM/°C

### Ordering Procedure (Example:Thin Film TC06 1/3W 0.1% 25PPM 1KΩ T/R-5000)

订购方式(例如: 薄膜TC06 1/3W 0.1% 25PPM 1KΩ T/R-5000)

**T C 0 6 2 5 B 1 0 0 1 T 5 K**

**Product Type (产品类型):**

Fill-in 4 digits with the Chip resistor type as follow (填四位数字表示产品类型):  
TC02, TC03, TC05, TC06, TC07, TC10, TC12

**Temperature coefficient (温度系数):**

Fill-in 2 digits with the codes as following (用下列代码填二位数):  
05 = 5PPM 10 = 10PPM  
15 = 15PPM 25 = 25PPM  
50 = 50PPM

**Tolerance (公差):**

B = ±0.1%  
C = ±0.25%  
D = ±0.5%  
F = ±1%

**Packing Type (包装类型):**

T = T/R (编带 / 卷带)  
B = Bulk in Poly bag (散装 / 袋装)  
C = Bulk in cassette (散装 / 盒装)

**Resistance Value (阻值):**

≤1%(E-24 & E-96 series)  
the 1st to 3rd digits are for the significant figures of the resistance and the 4th indicate the numbers of zeros following.  
≤1% 产品 (E-24, E-96 系列阻值):  
第 1-3 位数表示阻值的有效数, 第4位数表示有几个0  
The flowing numbers and the ltter codes is to be used to indicate the number of zeros in the 11th digit:  
以下数字及字母用来表示第11位数有几个0:  
0=10<sup>0</sup> 1=10<sup>1</sup> 2=10<sup>2</sup> 3=10<sup>3</sup> 4=10<sup>4</sup> 5=10<sup>5</sup> 6=10<sup>6</sup>  
J=10<sup>1</sup> K=10<sup>2</sup> L=10<sup>3</sup> M=10<sup>4</sup> N=10<sup>5</sup> P=10<sup>6</sup>

**Packing Qty. (包装数量):**

4=4,000pcs  
5=5,000pcs  
C=10,000pcs  
D=20,000pcs  
E=15,000pcs

**Special Feature (特征):**

B=1/32W C=1/16W F=1/10W  
G=1/8W H=1/6W J=1/4W  
K=1/3W M=1/2W N=3/4W  
P=1W S=Special

Remark: For more details, please check page 139, Part No. System. 注: 更多细节详见 P139 标准料号系统。

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