High-Precision Thin Film Chip Resistors - TC

高精密薄膜晶片电阻器-TC系列

www.royalohm.com

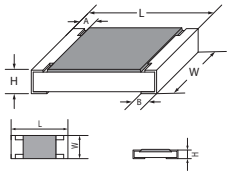
Feature (特性)

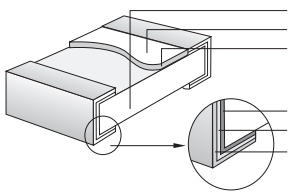
- Thin film NiCr Resistance element
  薄膜镍铬阻抗组件
- Very tight tolerance ±0.1% ~ ±0.5%
  高精密的公差 ±0.1% ~ ±0.5%
- Extremely low TCR ±5ppm~±50ppm
  极低的温度系数 ±5ppm~±50ppm
- Completed Lead-free 完全无铅产品

Application (应用)

- 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

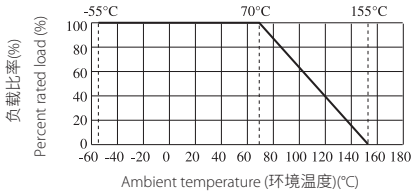
Figures (型状)





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

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	$1.25^{+0.15}_{-0.10}$	0.55±0.10	0.3±0.2	0.40±0.20
TC06	1206 (3216)	3.10±0.15	$1.55^{+0.15}_{-0.10}$	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	ΔR≤±(0.5%+0.05Ω)
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 appiy for 1 min. 2. Through Hole 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)。	ΔR≤±(0.5%+0.05Ω)
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)。	ΔR≤±(0.5%+0.05Ω)
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。	ΔR≤±(0.5%+0.05Ω)
Terminal bending 端子弯曲	(Applicable for CHIP Resisters 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。	ΔR≤±(0.2%+0.05Ω)
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。	0.1%、0.25%: ΔR≤±(0.2%+0.05Ω) 0.5%: ΔR≤±(0.5%+0.05Ω)

Electrical Data (电气参数)

Type 类型	Power Rating 额定功率	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
						±0.1% ±0.25%	±0.5% ±1%	
TC02	1/16W	-55℃~+155℃	25V	50V	100V	100Ω~2KΩ	100Ω~2KΩ	±5PPM/℃
						50Ω~12KΩ	50Ω~12KΩ	±10PPM/℃
						10Ω~332KΩ	10Ω~332KΩ	±25PPM/℃
						10Ω~332KΩ	10Ω~332KΩ	±50PPM/℃
TC03	1/10W	-55℃~+155℃	75V	150V	300V	100Ω~4KΩ	100Ω~4KΩ	±5PPM/℃
						10Ω~50KΩ	10Ω~50KΩ	±10PPM/℃
						4.7Ω~1MΩ	1Ω~1MΩ	±25PPM/℃
						4.7Ω~1MΩ	1Ω~1MΩ	±50PPM/℃
TC05	1/8W	-55℃~+155℃	150V	300V	500V	100Ω~15KΩ	100Ω~15KΩ	±5PPM/℃
						10Ω~100KΩ	10Ω~100KΩ	±10PPM/℃
						4.7Ω~2MΩ	1Ω~2MΩ	±25PPM/℃
						4.7Ω~2MΩ	1Ω~2MΩ	±50PPM/℃
TC06	1/4W	-55℃~+155℃	200V	400V	500V	100Ω~15KΩ	100Ω~15KΩ	±5PPM/℃
						10Ω~200KΩ	10Ω~200KΩ	±10PPM/℃
						4.7Ω~3MΩ	1Ω~3MΩ	±25PPM/℃
						4.7Ω~3MΩ	1Ω~3MΩ	±50PPM/℃
TC07	1/3W	-55℃~+155℃	200V	400V	500V	10Ω~1MΩ	10Ω~1MΩ	±10PPM/℃
						4.7Ω~1.5MΩ	2.49Ω~1.5MΩ	±25PPM/℃
						4.7Ω~1.5MΩ	2.49Ω~1.5MΩ	±50PPM/℃
TC10	1/3W	-55℃~+155℃	200V	400V	500V	100Ω~25KΩ	100Ω~25KΩ	±5PPM/℃
						50Ω~200KΩ	50Ω~200KΩ	±10PPM/℃
	1/2W					4.7Ω~3MΩ	1Ω~3MΩ	±25PPM/℃
						4.7Ω~3MΩ	1Ω~3MΩ	±50PPM/℃
TC12	3/4W	-55℃~+155℃	200V	400V	500V	100Ω~25KΩ	100Ω~25KΩ	±5PPM/℃
						50Ω~200KΩ	50Ω~200KΩ	±10PPM/℃
						4.7Ω~3MΩ	1Ω~3MΩ	±25PPM/℃
						4.7Ω~3MΩ	1Ω~3MΩ	±50PPM/℃

Ordering Procedure (Example:Thin Film TC06 1/4W 0.1% 25PPM 1KΩ T/R-5000)

订购方式(例如: 薄膜TC06 1/4W 0.1% 25PPM 1KΩ T/R-5000)

T C 0 6 2 5 B 1 0 0 1 T 5 J

Product Type (产品类型):
Fill-in 4 digits with the Chip resistor type as follow (填四位数表示产品类型):
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%

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 number 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 following numbers and the letter 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=10^0 1=10^1 2=10^2 3=10^3 4=10^4 5=10^5 6=10^6
J=10^{-1} K=10^{-2} L=10^{-3} M=10^{-4} N=10^{-5} P=10^{-6}

Packing Type (包装类型):
T = T/R (编带 / 卷带)
B = Bulk in Poly bag (散装 / 袋装)

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):
C=1/16W F=1/10W G=1/8W
M=1/2W J=1/4W K=1/3W
S=Special N=3/4W

Remark: For more details, please check page 152, Part No. System. 注：更多细节详见 P152 标准料号系统。