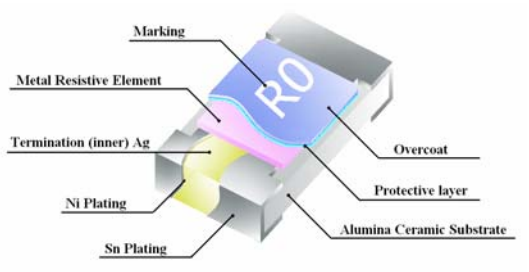
# THIN FILM CHIP RESISTORS

## Features

- Thin film NiCr resistance element
- Very tight tolerance from ± 0.01%, ± 0.05%, ± 0.10%, ± 0.25%
- Extremely low TCR from ± 5 ~ ± 50 PPM/°C




## Application

- Medical equipment
- Testing / Measurement equipment
- Communication device, cell phone, GPS, PDA
- Automatic equipment controller
- Printer equipment
- Converters

## Ordering Procedure: (Ex.: 1/16W, +/- 0.1%, 1.2KΩ, 10ppm, T/R-5000)

| E | 6 | 0 | 3 | W | G | B | 1 | 2 | 0 | 1 | T | 5 | B |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

**Resistor Type:**
Chip Resistor types as follows:
E402 = 0402, E603 = 0603,
E805 = 0805, E206 = 1206,
E210 = 1210, E010 = 2010,
E512 = 2512

**Wattage:**
Normal size: WG=1/16W, WA=1/10W, W8=1/8W, W4=1/4W, W2=1/2W, 1W=1W

Small size: SA=1/10W-S, S8=1/8W-S, S4=1/4W-S, S3=1/3W-S, 07=3/4W-S

Special: WH=1/32W

**Tolerance:**
B = ±0.1%
C = ±0.25%
D = ±0.5%

**Resistance Value:**
- E-96 series: the 1st to 3rd digits are for the significant figures of the resistance and the 4th digit indicate the number of zeros. "J" ~ 0.1, "K" ~ 0.01, "L" ~ 0.001
  **Ex.** 012J ~ 1Ω2, 226K ~ 2Ω26
- **Jumper :** use "0"

**Packing Type:**
T = Paper Tape / Reel
E = Plastic Tape / Reel
B = Bulk in Cassette

**Packing Qty:**
1 = 1,000 pcs, 2 = 2,000 pcs, 3 = 3,000 pcs,
4 = 4,000 pcs, 5 = 5,000 pcs,
C = 10,000 pcs, D = 20,000 pcs, G = 25,000 pcs

**Special Feature:**

| | |
|---|---|
| A : 5ppm | G : 150ppm |
| B : 10ppm | H : 200ppm |
| C : 15ppm | I : 300ppm |
| D : 25ppm | J : 400ppm |
| E : 50ppm | K : 500ppm |
| F : 100ppm | L : 600ppm |

** More explanation on part no, please see details on pages 79-80.*

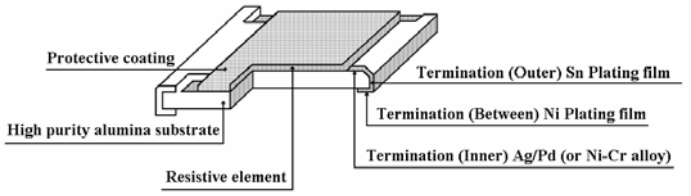
## Performance Specifications

| | |
|---|---|
| **Short-time overload** | ± 0.25%, ± 0.5%: ΔR/R ≤ ± 0.5% |
| **Insulation Resistance** | Min. 1,000 Mega Ohm |
| **Load Life** | ± 0.25%, ± 0.10%: ΔR/R ≤ ± 0.2%; > 7KΩ ΔR ≤ ± 0.5% |
| **Humidity (Steady State)** | ± 0.25%, ± 0.10%: ΔR/R ≤ ± 0.3% |
| **Bending Strength** | ± 0.25%, ± 0.10%: ΔR/R ≤ ± 0.2% |
| **Solderability** | Min. 95% coverage |
| **Resistance to Soldering Heat** | ± 0.25%, ± 0.10%: ΔR/R ≤ ± 0.2% |

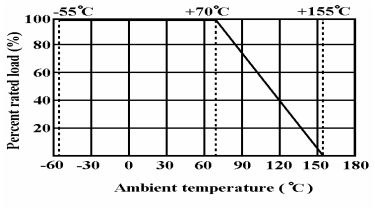
** More details, please see pages 77-78.*

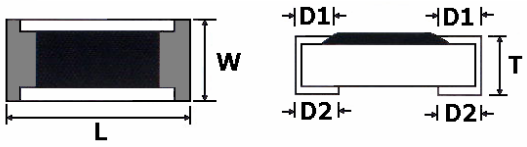
# THIN FILM CHIP RESISTORS

## Construction




### Derating Curve




## Dimension (mm)

| Type | L | W | T | $D_1$ | $D_2$ |
|---|---|---|---|---|---|
| E402 | 1.00 ± 0.10 | 0.50 ± 0.05 | 0.35 ± 0.05 | 0.20 ± 0.10 | 0.25 ± 0.10 |
| E603 | 1.60 ± 0.10 | 0.80 $^{+0.15}_{-0.10}$ | 0.45 ± 0.10 | 0.30 ± 0.20 | 0.30 ± 0.20 |
| E805 | 2.00 ± 0.15 | 1.25 $^{+0.15}_{-0.10}$ | 0.55 ± 0.10 | 0.40 ± 0.20 | 0.40 ± 0.20 |
| E206 | 3.10 ± 0.15 | 1.55 $^{+0.15}_{-0.10}$ | 0.55 ± 0.10 | 0.45 ± 0.20 | 0.45 ± 0.20 |
| E010 | 5.00 ± 0.10 | 2.50 $^{+0.15}_{-0.10}$ | 0.55 ± 0.10 | 0.60 ± 0.25 | 0.50 ± 0.20 |
| E512 | 6.35 ± 0.10 | 3.20 $^{+0.15}_{-0.10}$ | 0.55 ± 0.10 | 0.60 ± 0.25 | 0.50 ± 0.20 |

## Power Rating

| Type | Power Rating at 70°C | Operating Temp. Range | Max. Working Voltage | Max. Overload Voltage | Resistance Tolerance | Resistance Range | TCR (PPM/°C) |
|---|---|---|---|---|---|---|---|
| E402 | 1/16W | -55°C~+155°C | 25V | 50V | ±0.10%<br>±0.25%<br>±0.50% | 50Ω ~ 2KΩ | ± 5ppm |
| | | | | | | 50Ω ~ 15KΩ | ± 10ppm |
| | | | | | | 10Ω ~ 100KΩ | ± 25ppm |
| | | | | | | 10Ω ~ 100KΩ | ± 50ppm |
| E603 | 1/16W | -55°C~+155°C | 50V | 100V | ±0.10% | 50Ω ~ 4KΩ | ± 5ppm |
| | | | | | | 25Ω ~ 100KΩ | ± 10ppm |
| | | | | | | 10Ω ~ 332KΩ | ± 25ppm |
| | | | | | | 10Ω ~ 332KΩ | ± 50ppm |
| | | | | | ±0.25%<br>±0.50% | 50Ω ~ 4KΩ | ± 5ppm |
| | | | | | | 25Ω ~ 100KΩ | ± 10ppm |
| | | | | | | 4.7Ω ~ 332KΩ | ± 25ppm |
| | | | | | | 4.7Ω ~ 332KΩ | ± 50ppm |
| E805 | 1/10W | -55°C~+155°C | 100V | 200V | ±0.10%<br>±0.25%<br>±0.50% | 50Ω ~ 10KΩ | ± 5ppm |
| | | | | | | 25Ω ~ 100KΩ | ± 10ppm |
| | | | | | | 4.7Ω ~ 1MΩ | ± 25ppm |
| | | | | | | 4.7Ω ~ 1MΩ | ± 50ppm |
| E206 | 1/8W | -55°C~+155°C | 150V | 300V | ±0.10%<br>±0.25%<br>±0.50% | 50Ω ~ 15KΩ | ± 5ppm |
| | | | | | | 25Ω ~ 400KΩ | ± 10ppm |
| | | | | | | 4.7Ω ~ 1MΩ | ± 25ppm |
| | | | | | | 4.7Ω ~ 1MΩ | ± 50ppm |
| E010 | 1/4W | -55°C~+155°C | 150V | 300V | ±0.10%<br>±0.25%<br>±0.50% | 50Ω ~ 25KΩ | ± 5ppm |
| | | | | | | 25Ω ~ 500KΩ | ± 10ppm |
| | | | | | | 4.7Ω ~ 1MΩ | ± 25ppm |
| | | | | | | 4.7Ω ~ 1MΩ | ± 50ppm |
| E512 | 1/2W | -55°C~+155°C | 150V | 300V | ±0.10%<br>±0.25%<br>±0.50% | 50Ω ~ 25KΩ | ± 5ppm |
| | | | | | | 25Ω ~ 500KΩ | ± 10ppm |
| | | | | | | 4.7Ω ~ 1MΩ | ± 25ppm |
| | | | | | | 4.7Ω ~ 1MΩ | ± 50ppm |