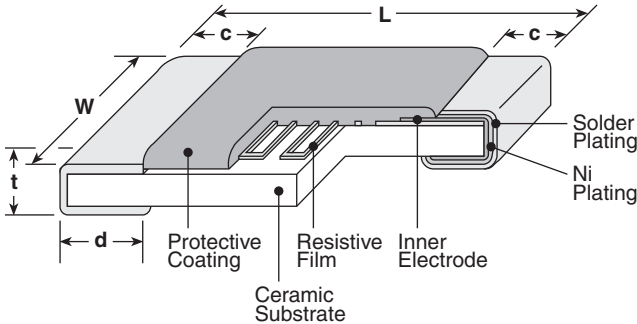


### features

- Thin film thermal sensors of SMD type
- Resistance tolerance  $\pm 1\%$ , a wide range of TCRs  $+3000 \times 10^{-6}/K \sim +5000 \times 10^{-6}/K$  with the standard products
- Suitable for control of temperatures in various industrial equipment
- Suitable for both flow and reflow soldering
- Products with lead-free terminations meet EU RoHS and China RoHS requirements

### dimensions and construction



| Type<br>(Inch Size Code) | Dimensions inches (mm)             |                                     |                                    |                                    |                                    |
|--------------------------|------------------------------------|-------------------------------------|------------------------------------|------------------------------------|------------------------------------|
|                          | L                                  | W                                   | c                                  | d                                  | t                                  |
| <b>1J</b><br>(0603)      | .063 $\pm$ .008<br>(1.6 $\pm$ 0.2) | .031 $\pm$ .008<br>(0.8 $\pm$ 0.2)  | .012 $\pm$ .008<br>(0.3 $\pm$ 0.2) | .012 $\pm$ .008<br>(0.3 $\pm$ 0.2) | .02 $\pm$ .004<br>(0.5 $\pm$ 0.1)  |
| <b>2A</b><br>(0805)      | .079 $\pm$ .008<br>(2.0 $\pm$ 0.2) | .049 $\pm$ .008<br>(1.25 $\pm$ 0.2) | .016 $\pm$ .008<br>(0.4 $\pm$ 0.2) | .016 $\pm$ .008<br>(0.4 $\pm$ 0.2) | .02 $\pm$ .006<br>(0.5 $\pm$ 0.15) |
| <b>2B</b><br>(1206)      | .126 $\pm$ .008<br>(3.2 $\pm$ 0.2) | .063 $\pm$ .008<br>(1.6 $\pm$ 0.2)  | .02 $\pm$ .012<br>(0.5 $\pm$ 0.3)  | .02 $\pm$ .012<br>(0.5 $\pm$ 0.3)  | .02 $\pm$ .006<br>(0.5 $\pm$ 0.15) |

### ordering information

|              |                                  |                      |  |   |  |             |
|--------------|----------------------------------|----------------------|--|---|--|-------------|
| <b>LP73</b>  | <b>2B</b>                        | <b>T</b>             | <b>TE</b>  | <b>103</b>                                    | <b>J</b>                                     | <b>3600</b> |
| Product Code | Size Code                        | Termination Material | Packaging  | Resistance Value                              | Tolerance                                    | T.C.R.      |
|              | 1J: 0603<br>2A: 0805<br>2B: 1206 | T: Sn                | TE: 4mm embossed pitch plastic (5,000 pieces/reel) | 2 significant figures + 1 multiplier 3 digits | F: $\pm 1\%$<br>G: $\pm 2\%$<br>J: $\pm 5\%$ |             |

### applications and ratings

| Part Designation | Power Rating | Thermal Time Constant (sec.)* | Thermal Dissipation Constant (mW/ $^{\circ}$ C)* | Rated Ambient Temp. | Operating Temp. Range                 |
|------------------|--------------|-------------------------------|--|---------------------|---------------------------------------|
| LP731J           | 0.016W       | 2                             | 1.2  | +70 $^{\circ}$ C    | -55 $^{\circ}$ C to +125 $^{\circ}$ C |
| LP732A           | 0.031W       | 4                             | 1.8  |                     |                                       |
| LP732B           | 0.063W       | 6.5                           | 2.4  |                     |                                       |

\* Thermal Time Constant and Dissipation Constant are reference values, which are values of elements and vary with connecting or fixing methods.

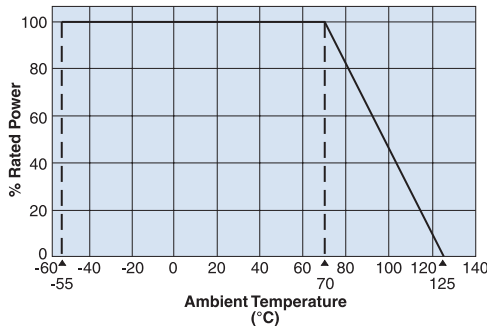
For further information on packaging, please refer to Appendix A.

**applications and ratings (continued)**

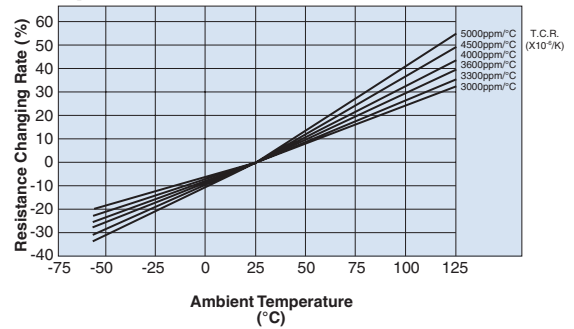
| T.C.R. (ppm/°C) Max. | T.C.R. Tolerance | Resistance Range E-24 |            |             | Resistance Tolerance       |
|----------------------|------------------|-----------------------|------------|-------------|----------------------------|
|                      |                  | 1J                    | 2A         | 2B          |                            |
| 3000                 | ±5%              | 100Ω-1kΩ              | 100Ω - 2kΩ | 100Ω - 10kΩ | F: ±1%, G: ±2%<br>J: ±5%   |
| 3300                 |                  |                       |            |             |                            |
| 3600                 |                  |                       |            |             | 100Ω-300Ω                  |
| 4000                 |                  | 330Ω-1kΩ              |            |             |                            |
| 4500                 |                  | 100Ω - 1kΩ            |            |             | F: ±1%<br>G: ±2%<br>J: ±5% |
| 5000                 |                  |                       |            |             |                            |

**environmental applications**

**Derating Curve**



**Temperature Characteristics**



**Approximate Expression for Resistance-Temperature Characteristics**

| T.C.R. (x10 <sup>-6</sup> /K) | C <sub>0</sub> | C <sub>1</sub> | C <sub>2</sub>             |
|-------------------------------|----------------|----------------|----------------------------|
| 3000                          | 0.931258       | 0.00265213     | 3.90112 x 10 <sup>-6</sup> |
| 3300                          | 0.924355       | 0.00292569     | 4.00516 x 10 <sup>-6</sup> |
| 3600                          | 0.916356       | 0.00323714     | 4.34428 x 10 <sup>-6</sup> |
| 4000                          | 0.907039       | 0.00361006     | 4.33457 x 10 <sup>-6</sup> |
| 4500                          | 0.897412       | 0.00395222     | 6.05201 x 10 <sup>-6</sup> |
| 5000                          | 0.886014       | 0.00437224     | 7.48809 x 10 <sup>-6</sup> |

(Values are not guaranteed but typical)

$$R_T = R_{25} (C_0 + C_1 T + C_2 T^2)$$

R<sub>T</sub>: Resistance value at T°C  
R<sub>25</sub>: Resistance value at 25°C  
T: Ambient temperature (°C)  
C<sub>0</sub>, C<sub>1</sub>, C<sub>2</sub>: Constants

**Performance Characteristics**

| Parameter                   | Requirement Δ R ±(%+0.05Ω) |         | Test Method   |
|-----------------------------|----------------------------|---------|---|
|                             | Limit                      | Typical |   |
| Resistance                  | Within regulated tolerance | —       | 25°C  |
| T.C.R.                      | Within specified T.C.R.    | —       | +25°C/+65°C   |
| Overload                    | ±0.5%                      | ±0.3%   | Rated voltage x 2.5 for 5 seconds   |
| Resistance to Solder Heat   | ±0.5%                      | ±0.3%   | 260°C ± 5°C, 10 seconds + 1 second/- 0 second   |
| Rapid Change of Temperature | ±0.5%                      | ±0.3%   | -55°C (30 minutes), +25°C (2-3 minutes), +125°C (30 minutes), +25°C (2-3 minutes), 5 cycles |
| Moisture Resistance         | ±2.0%                      | ±1.5%   | 40°C ± 2°C, 90 - 95% RH, 1000 hours, 1.5 hours ON, 0.5 hours OFF cycle                      |
| Endurance at 70°C           | ±2.0%                      | ±1.5%   | 70°C ± 2°C, 1000 hours, 1.5 hours ON, 0.5 hours OFF cycle                                   |

Confirming resistance drift is recommended since this product has a tendency to have bigger resistance change than general flat chip over 70°C. Please pay attention not to be applied ESD, it may cause of resistance change.

**Actual Value (Out of Guarantee)**

| Test Items                | Reference | Test Method                |
|---------------------------|-----------|----------------------------|
| High Temperature Exposure | ±8.0%     | 125°C, 1000 hours          |
| ESD                       | 500V      | Human model, 100 pF 1.5 kΩ |

Specifications given herein may be changed at any time without prior notice. Please confirm technical specifications before you order and/or use.

1/02/14