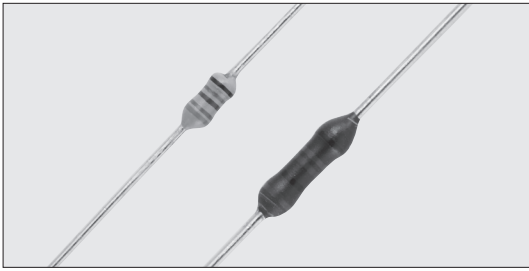
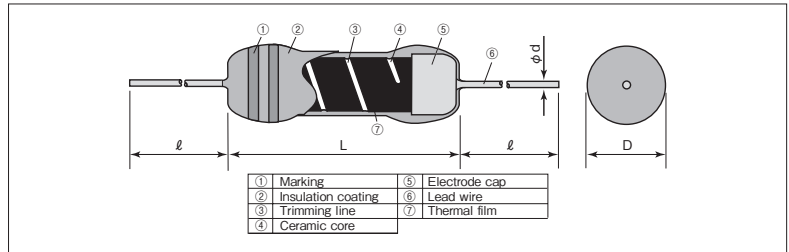


## LP Thin Film Resistance Thermal Sensors



Coating color : Ivory (LP1/16), Brown (LP1/8)  
 Marking : Color code

### Construction



### Features

- LP series is thin-film thermal sensors and accommodates resistance tolerance  $\pm 1\%$  and high T.C.R.  $+5000 \times 10^{-6}/K$  with the standard products.
- Suitable for control of temperatures for various industrial equipment.
- Products meet EU-RoHS requirements.

### Applications

- Temperature compensation for Load Cells in a Electronic Weighing Instruments.
- Overheat prevention for Printer Heads.
- Temperature compensation for Home Electrical Appliances, Measuring Instruments and Communications Equipment.
- Overheat prevention for various PCBs.

### Dimensions

Type	Dimensions (mm)				Weight (g) (1000pcs)
	L	D $\pm 0.2$	d $\pm 0.05$	l $\pm 3$	
LP 1/16	3.5 $^{+0.2}_{-0.4}$	1.7	0.5	30	150
LP 1/8	6.35 $\pm 0.8$	2.3	0.65	38	250

### Type Designation

Example

LP	1/8	C	T26	A	103	J	362
Product Code	Power Rating	Termination Surface Material	Taping	Packaging	Nominal Resistance	Resistance Tolerance	Symbol of T.C.R.
	1/16: 0.063W 1/8 : 0.125W	C:SnCu	Nil: Bulk T26: 26mm Taping T52: 52mm Taping	Nil : Bulk A : AMMO	3digits	F : $\pm 1\%$ G : $\pm 2\%$ J : $\pm 5\%$	3digits 151 : 150 362 : 3600

Contact us when you have control request for environmental hazardous material other than the substance specified by EU-RoHS.  
 For further information on taping, please refer to APPENDIX C on the back pages.

### Ratings

Type	Power Rating (W)	Thermal Time Constant <sup>*1</sup> (s)	Thermal Dissipation Constant <sup>*1</sup> (mW/°C)	Rated Ambient Temperature (°C)	Operating Temperature Range (°C)	Taping & Qty/AMMO (pcs)	
						T26A	T52A
LP1/16C	0.063	8	2.5	+70	-55~+150	4,000	4,000
LP1/8C	0.125	14	4.5			2,000	2,000

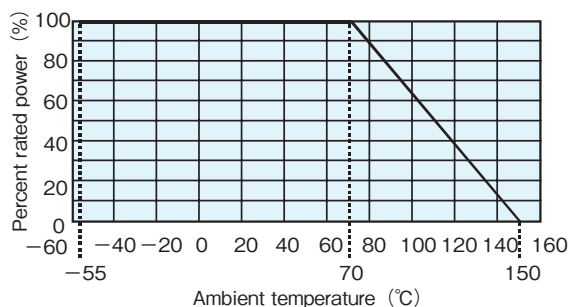
\*1 Thermal time constant and dissipation constant are reference values, which are values of elements and vary with connecting or fixing methods.

### T.C.R. and Resistance Range

T.C.R. ( $\times 10^{-6}/K$ ) <sup>*2</sup>	T.C.R. Tolerance	Resistance Range ( $\Omega$ ) (E24 & 2.5, $5.0 \times 10^3$ )					
		LP1/16			LP1/8		
		F : $\pm 1\%$	G : $\pm 2\%$	J : $\pm 5\%$	F : $\pm 1\%$	G : $\pm 2\%$	J : $\pm 5\%$
150 · 250 · 350 450	$\pm 50 \times 10^{-6}/K$	-	150~10k	150~10k	-	150~51k	150~51k
550 · 650 · 750 · 850 950 · 1000 · 1200 1400 · 1600 · 1800 2000 · 2200 · 2400			150~30k	150~30k		150~100k	150~100k
2500 3000 3300 3600 4000 · 4500 · 5000	$\pm 5\%$	100~30k	10~30k	1~30k	100~100k	10~100k	1~100k
		100~10k	10~10k	1~10k	100~51k 100~20k	10~51k 10~20k	1~51k 1~20k

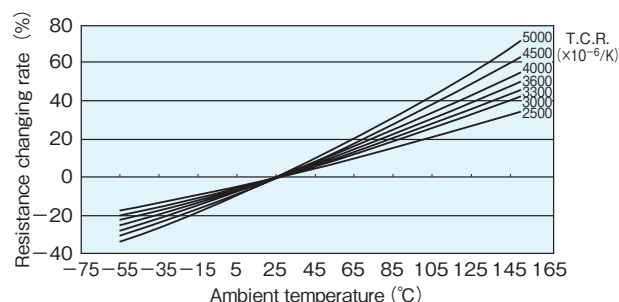
\*2 T.C.R. Measuring Temperature :  $+25^\circ C / +65^\circ C$ . T.C.R. is guaranteed by random inspections.

## Derating Curve



For sensors operated at an ambient temperature of 70°C or higher, the power shall be derated in accordance with the above derating curve.

## Example of Temperature Characteristics of Resistance



## Approximate Expression for Resistance-Temperature Characteristics

(Values are not guaranteed but typical.)

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

$R_t$  : Resistance value at  $T$ °C

$R_{25}$  : Resistance value at 25°C

$T$  : Ambient temperature (°C)

$C_0, C_1, C_2$  : Constants

T.C.R.	$C_0$	$C_1$	$C_2$
3000	0.931258	0.00265213	$3.90112 \times 10^{-6}$
3300	0.924355	0.00292569	$4.00516 \times 10^{-6}$
3600	0.916356	0.00323714	$4.34428 \times 10^{-6}$
4000	0.907039	0.00361006	$4.33457 \times 10^{-6}$
4500	0.897412	0.00395222	$6.05201 \times 10^{-6}$
5000	0.886014	0.00437224	$7.48809 \times 10^{-6}$

## Performance

Test Items	Performance Requirements $\Delta R \pm$ (%+0.05 $\Omega$ )		Test Methods
	Limit	Typical	
Resistance	Within specified tolerance	—	25°C
T.C.R.	Within specified T.C.R.	—	+25°C/+65°C
Overload (Short time)	0.5	0.2	Rated voltage $\times 2.5$ for 5s.
Resistance to soldering heat	0.5	0.2	350°C $\pm$ 10°C, 1s
Rapid change of temperature	0.5	0.2	-55°C (30min.) / +25°C (10min.) / +150°C (30min.) / +25°C (10min.)、5 cycles
Moisture resistance	2	0.3	40°C $\pm$ 2°C, 90%~95%RH, 1000h 1.5h ON/0.5h OFF cycle
Endurance at 70°C	2	0.5	70°C $\pm$ 3°C, 1000h 1.5h ON/0.5h OFF cycle

## Precautions for Use

- The resistance of the part changes by its self heat-generation, so use it in consideration of this. The sensor operated at rated power causes a temperature error of 10°C or more.
- Some areas of  $+3000 \times 10^{-6}/K$  to  $+5000 \times 10^{-6}/K$  use a special temperature sensing film (patented). Consult with us if the sensor will be always operated in a high temperature region.
- Ionic impurities such as flux etc. that are attached to these products or those mounted onto a PCB, negatively affect their moisture resistance, corrosion resistance, etc. The flux may contain ionic substances like chlorine, acid, etc. Please wash them to get rid of these ionic substances especially when using lead-free solder that may contain much of the said substances for improving a wetting characteristic. Using RMA solder or RMA flux, or well-washing is needed. Also, attaching ionic substances such as perspiration, salt etc. by storage environments or mounting conditions/environments negatively affects their moisture resistance, corrosion resistance etc. Please wash them to remove the ionic substances when they are polluted.
- When the components are polluted by ionic impurities like sodium ( $Na^+$ ), chlorine ( $Cl^-$ ) etc. included in perspiration and saliva, it leads to electric erosion. Avoid the pollution when storage, mounting and using. Consider not to remain ionic substances on the components. Wash by pure water etc. and dry them when you find pollution.