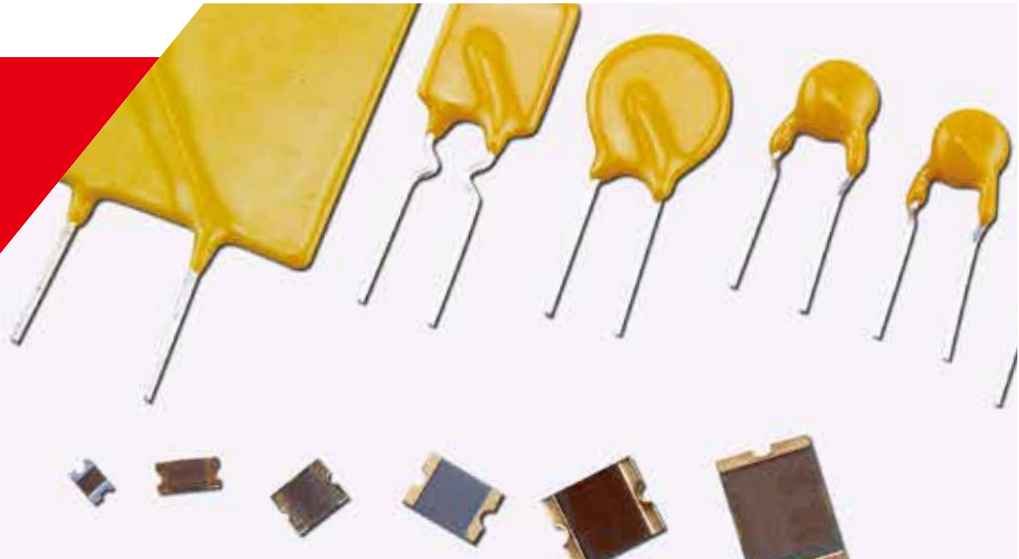


**RUILON**

瑞隆源电子



# Positive Thermal Coefficient

**RL30 Series**

**361°** Circuit Protection  
System

Revision:MAR-17

Please refer to <http://www.ruilon.com.cn> for current information.

## Positive Thermal Coefficient - RL30 Series

Positive Thermal Coefficient devices(PTC),provide over-current protection for electrical and electronic devices.They function using conducting strips of metal imbedded inside polymers.Under normal conditions,the devices resistance is near zero,but over-current conditions will heat the PTC and expand the polymer,increasing the impedance.When current returns to normal,the components cool down,returning to their original shape and very low levels of resistance.



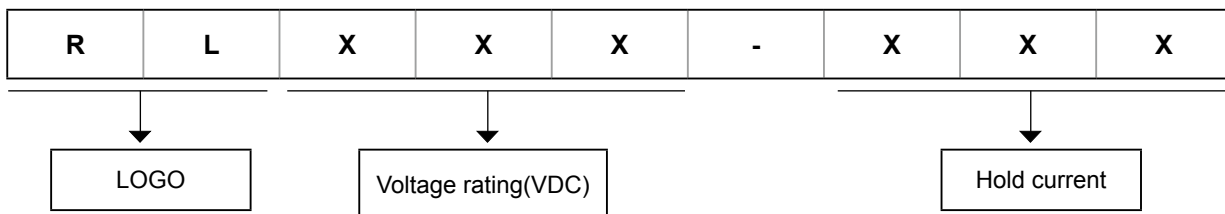
### Features

- I(hold): 0.5~9.0A
- 30V Operating voltages
- Radial leaded devices
- Over-current protection
- Very high voltage surge capabilities.
- Available in lead-free version.
- Fast time-to-trip
- RoHS compliant, Lead- Free and Halogen-Free

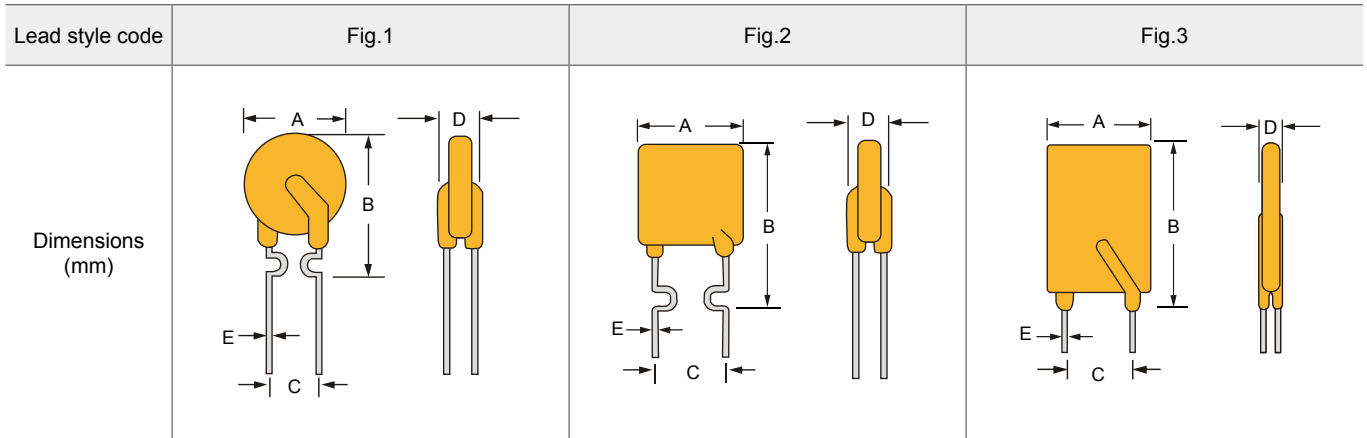
### Applications

- Overcurrent and overtemperature protection of automotive electronics
- Hard disk drives
- Point-of-sale (POS) equipment
- PCMCIA cards
- Power over Ethernet (POE)
- HDMI 1.4 Source protection
- Computers & peripherals
- Industrial control
- Security systems

### Product Name



## Positive Thermal Coefficient - RL30 Series



| Type Number | $I_{hold}$ | $I_T$ | $V_{max}$ | Time-to-Trip |             | $I_{max}$ | $R_{max}$ | $R_{min}$ | Package Dimensions (mm) |         |         |         |         | Circuit Figure |
|-------------|------------|-------|-----------|--------------|-------------|-----------|-----------|-----------|-------------------------|---------|---------|---------|---------|----------------|
|             | A          | A     | V         | $I_{trip} A$ | $T_{max} S$ | A         | $\Omega$  | $\Omega$  | A (max)                 | B (max) | C (typ) | D (max) | E (typ) |                |
| RL30-050    | 0.5        | 1     | 30        | 1.5          | 15          | 40        | 0.8       | 0.2       | 8                       | 14      | 5.1     | 3       | 0.5     | Fig.1          |
| RL30-070    | 0.7        | 1.4   | 30        | 2.1          | 15          | 40        | 0.45      | 0.12      | 7.4                     | 13      | 5.1     | 3       | 0.5     | Fig.1          |
| RL30-075    | 0.75       | 1.5   | 30        | 2.25         | 15          | 40        | 0.35      | 0.12      | 7.4                     | 13      | 5.1     | 3       | 0.5     | Fig.2          |
| RL30-090    | 0.9        | 1.8   | 30        | 2.7          | 15          | 40        | 0.22      | 0.07      | 7.4                     | 13      | 5.1     | 3       | 0.5     | Fig.2          |
| RL30-110    | 1.1        | 2.2   | 30        | 3.3          | 15          | 40        | 0.2       | 0.05      | 7.4                     | 14.5    | 5.1     | 3       | 0.5     | Fig.2          |
| RL30-135    | 1.35       | 2.7   | 30        | 4.05         | 15          | 40        | 0.16      | 0.04      | 9.2                     | 14.5    | 5.1     | 3       | 0.6     | Fig.2          |
| RL30-160    | 1.6        | 3.2   | 30        | 4.8          | 20          | 40        | 0.14      | 0.03      | 10                      | 17      | 5.1     | 3       | 0.6     | Fig.2          |
| RL30-185    | 1.85       | 3.7   | 30        | 5.55         | 20          | 40        | 0.12      | 0.03      | 11                      | 17.5    | 5.1     | 3       | 0.6     | Fig.2          |
| RL30-200    | 2          | 4     | 30        | 6            | 20          | 40        | 0.1       | 0.02      | 12                      | 19.5    | 5.1     | 3       | 0.6     | Fig.2          |
| RL30-250    | 2.5        | 5     | 30        | 7.5          | 20          | 40        | 0.08      | 0.02      | 12.4                    | 20      | 5.1     | 3       | 0.6     | Fig.2          |
| RL30-300    | 3          | 6     | 30        | 9            | 20          | 40        | 0.07      | 0.02      | 13                      | 20      | 5.1     | 3       | 0.8     | Fig.3          |
| RL30-400    | 4          | 8     | 30        | 12           | 20          | 40        | 0.07      | 0.01      | 14                      | 20.1    | 5.1     | 3       | 0.8     | Fig.3          |
| RL30-500    | 5          | 10    | 30        | 15           | 20          | 40        | 0.07      | 0.01      | 17.7                    | 21.5    | 10.5    | 3       | 0.8     | Fig.3          |
| RL30-600    | 6          | 12    | 30        | 18           | 25          | 40        | 0.04      | 0.005     | 18                      | 26      | 10.5    | 3       | 0.8     | Fig.3          |
| RL30-700    | 7          | 14    | 30        | 21           | 25          | 40        | 0.03      | 0.005     | 20                      | 27      | 10.5    | 3       | 0.8     | Fig.3          |
| RL30-800    | 8          | 16    | 30        | 24           | 25          | 40        | 0.03      | 0.005     | 23.5                    | 29.2    | 10.5    | 3       | 0.8     | Fig.3          |
| RL30-900    | 9          | 18    | 30        | 27           | 25          | 40        | 0.02      | 0.005     | 24.3                    | 30      | 10.5    | 3       | 0.8     | Fig.3          |

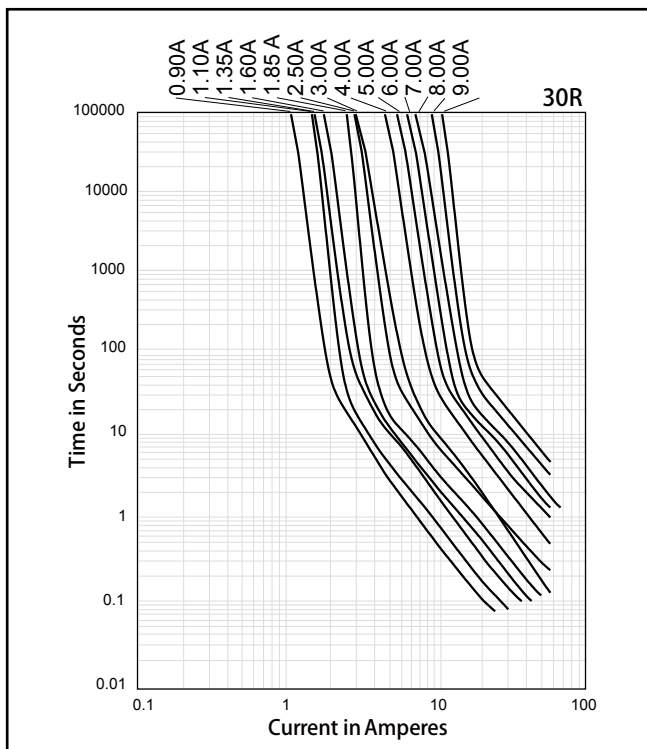
- $I_H$  = Hold current: maximum current device will pass without tripping in 25°C still air.
- $I_T$  = Trip current: minimum current at which the device will trip in 25°C still air.
- $V_{MAX}$  = Maximum voltage device can withstand without damage at rated current.
- $I_{MAX}$  = Maximum fault current device can withstand without damage at rated voltage.
- $R_{MAX}$  = Maximum resistance of device in initial (un-soldered) state.
- $R_{MIN}$  = Minimum resistance of device in initial (un-soldered) state.
- Pd typ. = Typical power dissipation from device when in the tripped state at 25°C still air

## Positive Thermal Coefficient - RL30 Series

### Ihold Versus Temperature

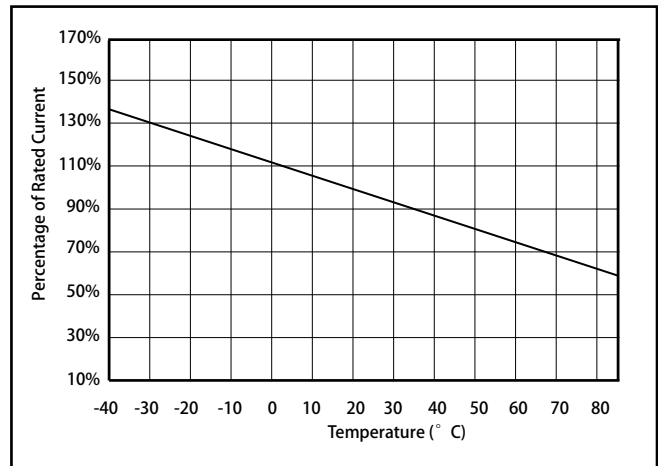
| Type Number | -40°C | -20°C | 0°C   | 25°C | 40°C | 50°C | 60°C | 70°C | 85°C |
|-------------|-------|-------|-------|------|------|------|------|------|------|
| RL30-050    | 0.78  | 0.68  | 0.60  | 0.50 | 0.41 | 0.36 | 0.32 | 0.27 | 0.20 |
| RL30-075    | 1.16  | 1.02  | 0.89  | 0.75 | 0.61 | 0.54 | 0.47 | 0.41 | 0.30 |
| RL30-090    | 1.31  | 1.17  | 1.04  | 0.90 | 0.75 | 0.69 | 0.61 | 0.55 | 0.47 |
| RL30-110    | 1.60  | 1.43  | 1.27  | 1.10 | 0.91 | 0.85 | 0.75 | 0.67 | 0.57 |
| RL30-135    | 1.96  | 1.76  | 1.55  | 1.35 | 1.12 | 1.04 | 0.92 | 0.82 | 0.70 |
| RL30-160    | 2.32  | 2.08  | 1.84  | 1.60 | 1.33 | 1.23 | 1.09 | 0.98 | 0.83 |
| RL30-185    | 2.68  | 2.41  | 2.13  | 1.85 | 1.54 | 1.42 | 1.26 | 1.13 | 0.96 |
| RL30-250    | 3.63  | 3.25  | 2.88  | 2.50 | 2.08 | 1.93 | 1.70 | 1.53 | 1.30 |
| RL30-300    | 4.35  | 3.90  | 3.45  | 3.00 | 2.49 | 2.31 | 2.04 | 1.83 | 1.56 |
| RL30-400    | 5.80  | 5.20  | 4.60  | 4.00 | 3.32 | 3.08 | 2.72 | 2.44 | 2.08 |
| RL30-500    | 7.25  | 6.50  | 5.75  | 5.00 | 4.15 | 3.85 | 3.10 | 3.05 | 2.60 |
| RL30-600    | 8.70  | 7.80  | 6.90  | 6.00 | 4.98 | 4.62 | 4.08 | 3.66 | 3.12 |
| RL30-700    | 10.15 | 9.10  | 8.05  | 7.00 | 4.81 | 5.39 | 4.76 | 4.27 | 3.64 |
| RL30-800    | 11.60 | 10.40 | 9.20  | 8.00 | 6.64 | 6.16 | 5.44 | 4.88 | 4.16 |
| RL30-900    | 13.05 | 11.70 | 10.35 | 9.00 | 7.47 | 6.93 | 6.12 | 5.49 | 4.68 |

### Average Time Current Curves



The average time current curves and Temperature Rerating curve performance is affected by a number of variables, and these curves provided as guidance only. Customer must verify the performance in their application.

### Temperature Rerating Curve



## Positive Thermal Coefficient - RL30 Series

### Manual Soldering Recommendation Parameters

| Items               | Conditions                                                                                                                                                                                                   |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Soldering condition | The highest power of the manual soldering iron should be 30W or less, soldering temperature should not be higher than 280℃ .                                                                                 |
| Soldering time      | The soldering time should be kept within 3 seconds, otherwise it might cause insulation layer cracking, and increased part resistance.                                                                       |
| Soldering position  | The distance on the leads between the soldering point and bottom of the PPTC body should be equal or greater than 4mm.                                                                                       |
| Other               | The soldering iron should not contact the PPTC body except the leads. If the soldering conditions are kept to lower temperature, less time and larger distance, the outcome of the soldering will be better. |

Notes: 1. Before using the device must be stored in the original bags, if the storage conditions do not guarantee, the device may not be able to meet the given value.  
 2. The devices can't used for reflow soldering.

### Mechanical Characteristics

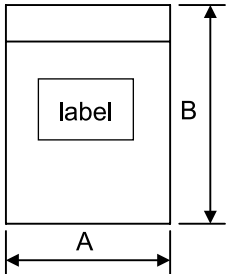
| Items            | Specifications    | Test Conditions/Methods          |
|------------------|-------------------|----------------------------------|
| Tensile strength | No visible damage | 1.0Kgf, 10 seconds               |
| Bending strength | No visible damage | 0.5Kgf, 90°, 3 times             |
| Vibration        | No visible damage | Freq: 10-55Hz, Amp: 0.75mm, 1min |

### Mechanical Characteristics

| Items                        | Specifications                                                  | Test Conditions/Methods                                                                  |
|------------------------------|-----------------------------------------------------------------|------------------------------------------------------------------------------------------|
| Solder ability               | No visible damage, Solder OK, Solder area $\geq 95\%$           | 245±5℃ , 2±1s, dipping depth=0.5inch max from the body                                   |
| Resistance to soldering heat | No visible damage, Electrical OK,   $\Delta R/R0$   $\leq 50\%$ | 260±5℃ , 10+2/-0s                                                                        |
| Damp heat, steady state      | No visible damage, Electrical OK,   $\Delta R/R0$   $\leq 20\%$ | 40±2℃ , 90~95 % RH, total 48Hrs, after 4Hrs test electrical parameter                    |
| Temperature cycling          | No visible damage, Electrical OK,   $\Delta R/R0$   $\leq 20\%$ | Ta = -10+0/-1℃ 30min, Ta = 70+1/- 0℃ 30min, 5cycles, after 1hr test electrical parameter |

## Positive Thermal Coefficient - RL30 Series

### Packaging

| Bag                                                                               | Part Number               | Dimension A×B (mm) | Quantity   |
|-----------------------------------------------------------------------------------|---------------------------|--------------------|------------|
|  | RL30-050<br>~<br>RL30-700 | 150×200            | 500pcs/bag |
|                                                                                   | RL30-800<br>~<br>RL30-900 | 150×200            | 200pcs/bag |