

## 30 Volt DC Radial Leaded, PolyTron™ PTC Devices

### PolyTron™ PTR030V Series



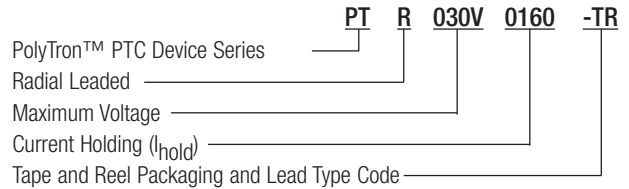
#### Description

- PolyTron™ radial leaded thru-hole PTC device
- Maximum 30 volts
- Current ratings from 0.90 to 9.00 amps
- Fast time-to-trip
- Low resistance
- Halogen free
- Lead free
- RoHS compliant

#### Agency Information

- cURus: Recognized Card: File E343021 (I<sub>hold</sub> 0.9-9A)
- TUV File: J 50194729

#### Part Number System/Ordering



**Lead Codes:** TR & BK - Straight Leads, TR1 & BK1 - Kinked Leads

#### TR & TR1 On Reels

- 0.90-1.60A - 3000 devices
- 1.85-3.00A - 2000 devices
- 4.00-9.00A - 1000 devices

#### BK & BK1 In Poly Bags

- 0.90-1.35A - 1,000 devices
- 1.60-6.00A - 500 devices
- 7.00-9.00A - 250 devices

#### Applications

- Medical equipment
- White goods
- Industrial power transmission
- Telecommunications
- Computers and peripherals
- Consumer and automotive electronics
- Rechargeable battery packs

### Specifications

| Catalog Number | V <sub>max</sub> (Vdc) | I <sub>max</sub> (Amps) | I <sub>hold</sub> @23°C (Amps) | I <sub>trip</sub> @23°C (Amps) | P <sub>d</sub> Typ. (W) | Time to Trip (Max.) |       | Resistance (Ω)            |       |                             | Agency Information |     |
|----------------|------------------------|-------------------------|--------------------------------|--------------------------------|-------------------------|---------------------|-------|---------------------------|-------|-----------------------------|--------------------|-----|
|                |                        |                         |                                |                                |                         |                     |       | Initial (R <sub>i</sub> ) |       | Post Trip (R <sub>1</sub> ) |                    |     |
|                |                        |                         |                                |                                |                         | (Amps)              | (Sec) | Min.                      | Max.  | Max.                        | cURus              | TUV |
| PTR030V0090    | 30                     | 40                      | 0.90                           | 1.80                           | 0.6                     | 4.50                | 5.90  | 0.070                     | 0.120 | 0.22                        | X                  | X   |
| PTR030V0110    | 30                     | 40                      | 1.10                           | 2.20                           | 0.7                     | 5.50                | 6.60  | 0.050                     | 0.100 | 0.17                        | X                  | X   |
| PTR030V0135    | 30                     | 40                      | 1.35                           | 2.70                           | 0.8                     | 6.75                | 7.30  | 0.040                     | 0.080 | 0.13                        | X                  | X   |
| PTR030V0160    | 30                     | 40                      | 1.60                           | 3.20                           | 0.9                     | 8.00                | 8.00  | 0.030                     | 0.070 | 0.11                        | X                  | X   |
| PTR030V0185    | 30                     | 40                      | 1.85                           | 3.70                           | 1.0                     | 9.25                | 8.70  | 0.030                     | 0.060 | 0.09                        | X                  | X   |
| PTR030V0250    | 30                     | 40                      | 2.50                           | 5.00                           | 1.2                     | 12.50               | 10.30 | 0.020                     | 0.040 | 0.07                        | X                  | X   |
| PTR030V0300    | 30                     | 40                      | 3.00                           | 6.00                           | 2.0                     | 15.00               | 10.80 | 0.020                     | 0.050 | 0.08                        | X                  | X   |
| PTR030V0400    | 30                     | 40                      | 4.00                           | 8.00                           | 2.5                     | 20.00               | 12.70 | 0.010                     | 0.030 | 0.05                        | X                  | X   |
| PTR030V0500    | 30                     | 40                      | 5.00                           | 10.00                          | 3.0                     | 25.00               | 14.50 | 0.010                     | 0.030 | 0.05                        | X                  | X   |
| PTR030V0600    | 30                     | 100                     | 6.00                           | 12.00                          | 3.5                     | 30.00               | 16.00 | 0.005                     | 0.020 | 0.04                        | X                  | X   |
| PTR030V0700    | 30                     | 100                     | 7.00                           | 14.00                          | 3.8                     | 35.00               | 17.50 | 0.005                     | 0.020 | 0.03                        | X                  | X   |
| PTR030V0800    | 30                     | 100                     | 8.00                           | 16.00                          | 4.0                     | 40.00               | 18.80 | 0.005                     | 0.013 | 0.02                        | X                  | X   |
| PTR030V0900    | 30                     | 100                     | 9.00                           | 18.00                          | 4.2                     | 45.00               | 20.00 | 0.005                     | 0.010 | 0.02                        | X                  | X   |

Notes:

I<sub>hold</sub> – Hold current: Maximum current device will pass without interruption in 23°C still air.

I<sub>trip</sub> – Trip current: Minimum current that will switch the device from low resistance to high resistance in 23°C still air.

V<sub>max</sub>: Maximum continuous voltage device can withstand without damage at rated current.

I<sub>max</sub>: Maximum fault current device can withstand without damage at rated voltage.

P<sub>d</sub>: Power dissipated from device when in the tripped state in 23°C still air.

R<sub>i</sub> (min.): Minimum resistance of device as supplied at 23°C unless otherwise specified.

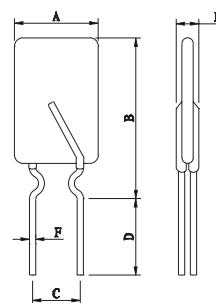
R<sub>i</sub> (max.): Maximum resistance of device as supplied at 23°C unless otherwise specified.

R<sub>1</sub> (max.): Maximum resistance of device when measured one hour post reflow (SMD) or one hour post trip (radial-leaded device) at 23°C unless otherwise specified.

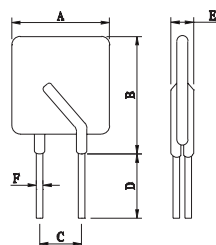
## Dimensions - mm

| Part Number | A Max. | B Max Lead Type |             | C        | D Min. | E Max. | F        | Figure/Lead Style |          |
|-------------|--------|-----------------|-------------|----------|--------|--------|----------|-------------------|----------|
|             |        | Straight (-TR)  | Kink (-TR1) |          |        |        |          | Straight TR       | Kink TR1 |
| PTR030V0090 | 7.4    | 12.2            | 12.2        | 5.0±0.8  | 7.6    | 3.0    | 0.5±0.02 | 2                 | 1        |
| PTR030V0110 | 7.4    | 14.2            | 14.2        | 5.0±0.8  | 7.6    | 3.0    | 0.5±0.02 | 2                 | 1        |
| PTR030V0135 | 8.9    | 13.5            | 13.5        | 5.0±0.8  | 7.6    | 3.0    | 0.5±0.02 | 2                 | 1        |
| PTR030V0160 | 8.9    | 15.2            | 15.2        | 5.0±0.8  | 7.6    | 3.0    | 0.5±0.02 | 2                 | 1        |
| PTR030V0185 | 10.2   | 15.7            | 15.7        | 5.0±0.8  | 7.6    | 3.0    | 0.5±0.02 | 2                 | 1        |
| PTR030V0250 | 11.4   | 18.3            | 20.5        | 5.0±0.8  | 7.6    | 3.0    | 0.5±0.02 | 2                 | 1        |
| PTR030V0300 | 11.4   | 17.3            | 21.8        | 5.0±0.8  | 7.6    | 3.0    | 0.8±0.02 | 2                 | 1        |
| PTR030V0400 | 14.0   | 20.1            | 24.6        | 5.0±0.8  | 7.6    | 3.0    | 0.8±0.02 | 2                 | 1        |
| PTR030V0500 | 14.0   | 24.9            | 26.6        | 10.0±0.8 | 7.6    | 3.0    | 0.8±0.02 | 2                 | 1        |
| PTR030V0600 | 16.5   | 24.9            | 29.4        | 10.0±0.8 | 7.6    | 3.0    | 0.8±0.02 | 2                 | 1        |
| PTR030V0700 | 19.1   | 26.7            | 31.2        | 10.0±0.8 | 7.6    | 3.0    | 0.8±0.02 | 2                 | 1        |
| PTR030V0800 | 21.6   | 29.2            | 33.7        | 10.0±0.8 | 7.6    | 3.0    | 0.8±0.02 | 2                 | 1        |
| PTR030V0900 | 24.1   | 29.7            | 34.2        | 10.0±0.8 | 7.6    | 3.0    | 0.8±0.02 | 2                 | 1        |

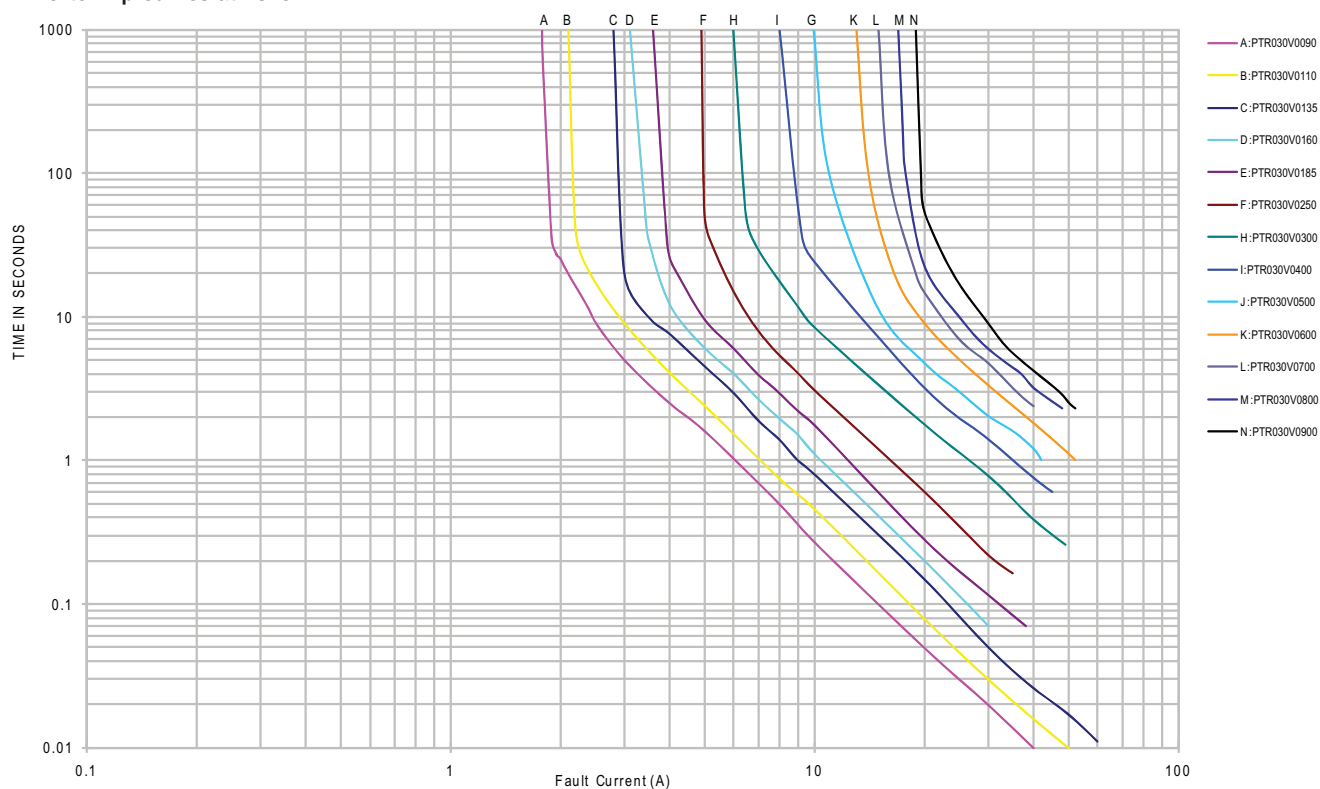
Style 1



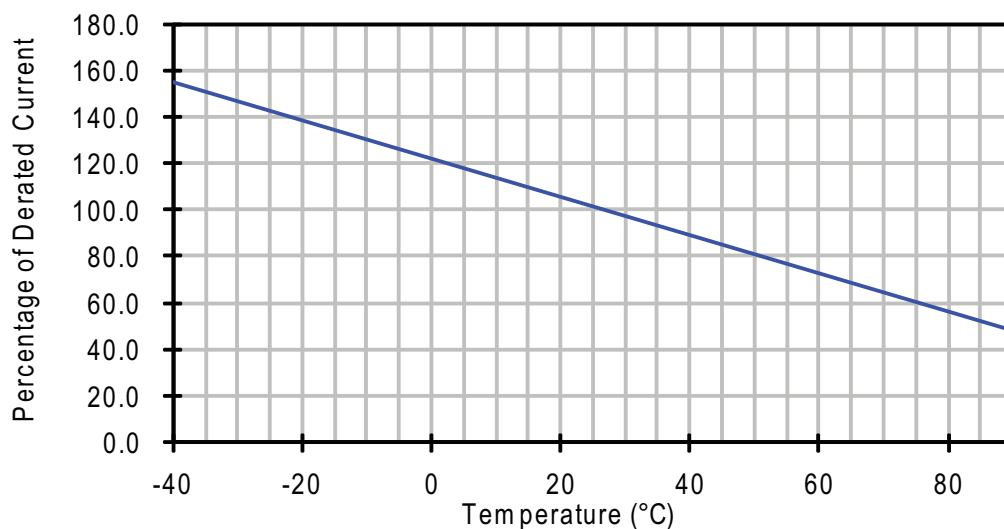
Style 2



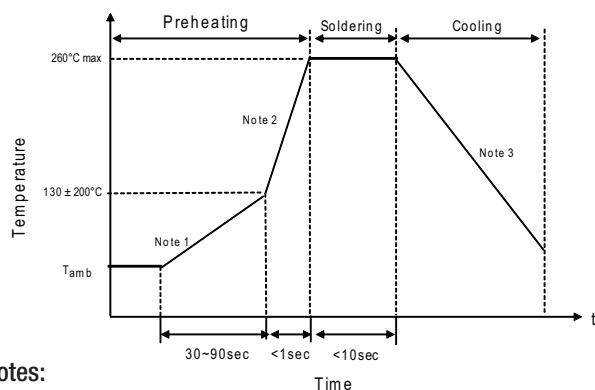
## Time-to-Trip Curves at 23°C



## Thermal Derating Curve



## Recommended Wave Solder Profile.



### Notes:

1. (1-3)°C/sec
2. Approximately 200°C/sec
3. 5°C/sec Maximum

| Environmental Specifications   |                                                                                                     |
|--------------------------------|-----------------------------------------------------------------------------------------------------|
| Characteristic                 | Value                                                                                               |
| Operating Temperature Range    | -40°C to +85°C                                                                                      |
| Surface Temperature Trip State | 125°C max.                                                                                          |
| Thermal Shock                  | +85°C to -40°C, 10 cycles, 5% typical resistance change                                             |
| Solvent Resistance             | MIL-STD-202 Method 215, no change                                                                   |
| Humidity Age Test              | +85°C, 85% R.H., 1000 hours<br>±5% typical resistance change.<br>Specified temperature (23°C ± 3°C) |
| Storage Temperature Range      | -10°C to +40°C                                                                                      |
| Storage Duration               | One year                                                                                            |
| Storage Relative Humidity      | ≤75%                                                                                                |
| Storage Conditions             | Keep away from corrosive atmosphere and sunlight                                                    |

## Recommended Reworking Conditions with Soldering Iron

- Soldering Iron Tip Temperature: 360°C max.
- Solder Time: 3 seconds max.
- Distance from Thermistor: 2mm min.

## Material Composition

- Lead material:
  - PTR030V0090-PTR030V0250 Tin-plated copper clad steel
  - PTR030V0300-PTR030V0900 Tin-plated copper
- Insulating material: Cured epoxy resin meeting UL 94V0 requirements

## Packaging/Taping Specifications

| Description                                                    | IEC Mark       | Dimension (mm) | Tolerance (mm) |
|----------------------------------------------------------------|----------------|----------------|----------------|
| Sprocket hole pitch                                            | P <sub>0</sub> | 12.7           | 0.3            |
| Ordinate to adjacent component lead<br>PTR030V0090~PTR030V0300 | P <sub>1</sub> | 3.6            | 1.0            |
| Ordinate to adjacent component lead<br>PTR030V0400             | P <sub>1</sub> | 3.45           | 1.0            |
| Ordinate to adjacent component lead<br>PTR030V0500~PTR030V0900 | P <sub>1</sub> | 7.3            | 1.0            |
| Device pitch PTR030V0090~PTR030V0300                           | P              | 12.7           | 1.0            |
| Device pitch PTR030V0400~PTR030V0900                           | P              | 25.4           | 1.0            |
| Lead spacing                                                   | C              | *              | --             |
| Carrier tape width                                             | W              | 18             | 1.0            |
| Top distance between tape edges                                | W <sub>0</sub> | 3.0            | Max.           |
| Hold-down tape width                                           | W <sub>1</sub> | 12             | 1.0            |
| Sprocket hole position                                         | W <sub>2</sub> | 9.0            | +0.75/-0.5     |
| Abscissa to top PTR030V0090~PTR030V0300                        | H <sub>1</sub> | 32.2           | Max.           |
| Abscissa to top PTR030V0400~PTR030V0900                        | H <sub>1</sub> | 47.5           | Max.           |
| Abscissa to plane (straight lead)                              | H              | 18.0           | +2/-0          |
| Abscissa to plane (kinked lead)                                | H <sub>0</sub> | 16.0           | ±0.5           |
| Sprocket hole diameter                                         | D <sub>0</sub> | 4              | ±0.2           |
| Lead protrusion                                                | L <sub>1</sub> | 1              | Max.           |
| Tape thickness                                                 | t              | 0.9            | Max.           |
| Body lateral deviation                                         | Δ <sub>h</sub> | 0              | ±1.0           |
| Body tape plane deviation                                      | Δ <sub>p</sub> | 0              | ±0.1.3         |
| Reel width                                                     | W <sub>3</sub> | 56             | Max.           |
| Reel diameter                                                  |                | 340            | ±10            |
| Arbor hole diameter                                            | n <sub>0</sub> | 31             | ±1             |
| Core diameter                                                  | n              | 80             | Min.           |

\* See Dimensions table.

Figure 1 - PTR030V0090-PTR030V0400

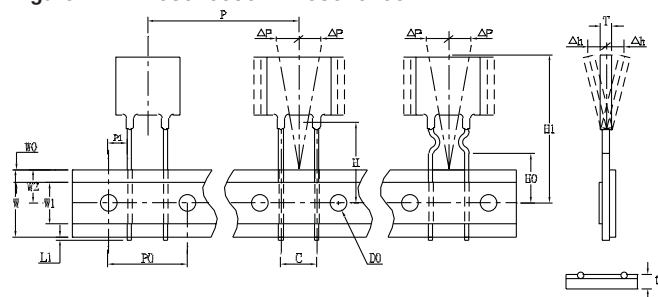
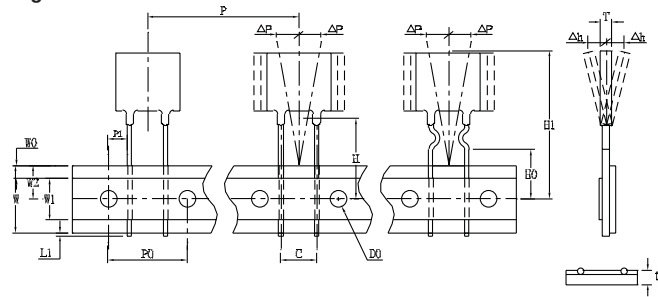
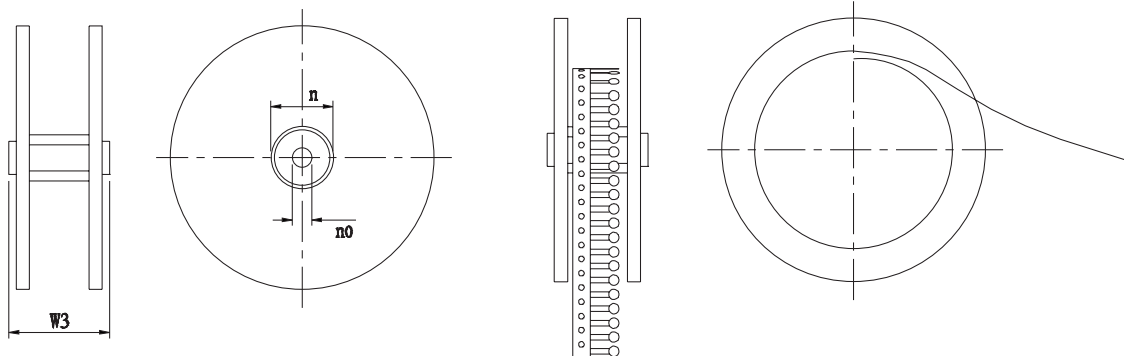


Figure 2 - PTR030V0500-PTR030V0900



## Reel Specifications



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