

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

### PolyTron™ PTR060V Series



Radial Leaded Device

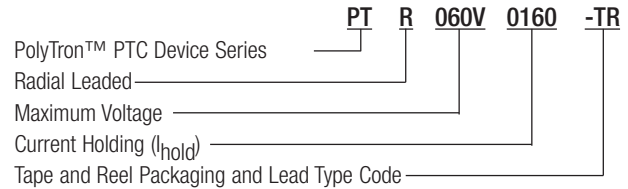
#### Description

- PolyTron™ radial leaded thru-hole PTC device
- Maximum 60 volts
- Current ratings from 0.10 to 3.75 amps
- Fast time-to-trip
- Low resistance
- Halogen free
- Lead free
- RoHS compliant

#### Agency Information

- cURus: Recognized Card: File E343021 (I<sub>hold</sub> 0.1-3.75A)
- TUV File: J 50194729

#### Part Number System/Ordering



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

#### TR & TR1 On Reels

- 0.10, 0.20-0.40A - 3000 devices
- 0.17 - 2,500A devices
- 0.50-0.90A - 2000 devices
- 1.10-1.85A - 1500 devices
- 2.50-3.75A - 1000 devices

#### BK & BK1 In Poly Bags

- 0.10-0.25A - 1000 devices
- 0.30-1.85A - 500 devices
- 2.50-3.75A - 250 devices

#### Applications

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

### Specifications

| 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 |
| PTR060V0010    | 60                     | 40                      | 0.10                           | 0.20                           | 0.38                    | 0.50                | 4.0   | 2.500                     | 4.500 | 7.50                        | X                  | X     |
| PTR060V0017    | 60                     | 40                      | 0.17                           | 0.34                           | 0.48                    | 0.85                | 3.0   | 3.300                     | 5.210 | 8.00                        | X                  | X     |
| PTR060V0020    | 60                     | 40                      | 0.20                           | 0.40                           | 0.41                    | 1.00                | 2.2   | 1.830                     | 2.750 | 4.40                        | X                  | X     |
| PTR060V0025    | 60                     | 40                      | 0.25                           | 0.50                           | 0.45                    | 1.25                | 2.5   | 1.250                     | 1.950 | 3.00                        | X                  | X     |
| PTR060V0030    | 60                     | 40                      | 0.30                           | 0.60                           | 0.49                    | 1.50                | 3.0   | 0.880                     | 1.330 | 2.10                        | X                  | X     |
| PTR060V0040    | 60                     | 40                      | 0.40                           | 0.80                           | 0.56                    | 2.00                | 3.8   | 0.550                     | 0.860 | 1.29                        | X                  | X     |
| PTR060V0050    | 60                     | 40                      | 0.50                           | 1.00                           | 0.77                    | 2.50                | 4.0   | 0.500                     | 0.770 | 1.17                        | X                  | X     |
| PTR060V0065    | 60                     | 40                      | 0.65                           | 1.30                           | 0.88                    | 3.25                | 5.3   | 0.310                     | 0.480 | 0.72                        | X                  | X     |
| PTR060V0075    | 60                     | 40                      | 0.75                           | 1.50                           | 0.92                    | 3.75                | 6.3   | 0.250                     | 0.400 | 0.60                        | X                  | X     |
| PTR060V0090    | 60                     | 40                      | 0.90                           | 1.80                           | 0.99                    | 4.50                | 7.2   | 0.200                     | 0.310 | 0.47                        | X                  | X     |
| PTR060V0110    | 60                     | 40                      | 1.10                           | 2.20                           | 1.50                    | 5.50                | 8.2   | 0.150                     | 0.250 | 0.38                        | X                  | X     |
| PTR060V0135    | 60                     | 40                      | 1.35                           | 2.70                           | 1.70                    | 6.75                | 9.6   | 0.120                     | 0.190 | 0.30                        | X                  | X     |
| PTR060V0160    | 60                     | 40                      | 1.60                           | 3.20                           | 1.90                    | 8.00                | 11.4  | 0.090                     | 0.140 | 0.22                        | X                  | X     |
| PTR060V0185    | 60                     | 40                      | 1.85                           | 3.70                           | 2.10                    | 9.25                | 12.6  | 0.080                     | 0.120 | 0.19                        | X                  | X     |
| PTR060V0250    | 60                     | 40                      | 2.50                           | 5.00                           | 2.50                    | 12.50               | 15.6  | 0.050                     | 0.080 | 0.13                        | X                  | X     |
| PTR060V0300    | 60                     | 40                      | 3.00                           | 6.00                           | 2.80                    | 15.00               | 19.8  | 0.040                     | 0.060 | 0.10                        | X                  | X     |
| PTR060V0375    | 60                     | 40                      | 3.75                           | 7.50                           | 3.20                    | 18.75               | 24.0  | 0.030                     | 0.050 | 0.08                        | 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.

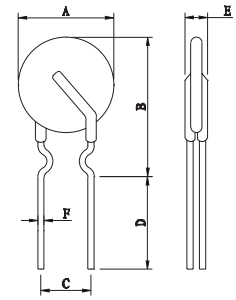
R<sub>i</sub> (max.): Maximum resistance of device as supplied at 23°C unless otherwise specified.

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.

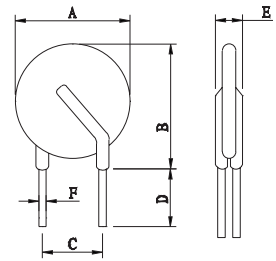
## Dimensions - mm

| 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 |
| PTR060V0010 | 7.4    | 12.7            | 12.7        | 5.0±0.8  | 7.6    | 3.0    | 0.5±0.02 | 2                 | 1        |
| PTR060V0017 | 7.4    | 12.7            | 12.7        | 5.0±0.8  | 7.6    | 3.0    | 0.5±0.02 | 2                 | 1        |
| PTR060V0020 | 7.4    | 12.2            | 12.2        | 5.0±0.8  | 7.6    | 3.0    | 0.5±0.02 | 2                 | 1        |
| PTR060V0025 | 7.4    | 12.7            | 12.7        | 5.0±0.8  | 7.6    | 3.0    | 0.5±0.02 | 2                 | 1        |
| PTR060V0030 | 7.4    | 13.0            | 13.0        | 5.0±0.8  | 7.6    | 3.0    | 0.5±0.02 | 2                 | 1        |
| PTR060V0040 | 7.6    | 13.5            | 13.5        | 5.0±0.8  | 7.6    | 3.0    | 0.5±0.02 | 2                 | 1        |
| PTR060V0050 | 7.6    | 13.7            | 13.7        | 5.0±0.8  | 7.6    | 3.0    | 0.5±0.02 | 2                 | 1        |
| PTR060V0065 | 9.7    | 14.5            | 14.5        | 5.0±0.8  | 7.6    | 3.0    | 0.5±0.02 | 2                 | 1        |
| PTR060V0075 | 10.4   | 15.2            | 15.2        | 5.0±0.8  | 7.6    | 3.0    | 0.5±0.02 | 2                 | 1        |
| PTR060V0090 | 11.7   | 15.7            | 15.7        | 5.0±0.8  | 7.6    | 3.0    | 0.5±0.02 | 2                 | 1        |
| PTR060V0110 | 13.0   | 18.0            | 18.0        | 5.0±0.8  | 7.6    | 3.0    | 0.8±0.02 | 2                 | 1        |
| PTR060V0135 | 14.5   | 19.6            | 19.6        | 5.0±0.8  | 7.6    | 3.0    | 0.8±0.02 | 2                 | 1        |
| PTR060V0160 | 16.3   | 21.3            | 21.3        | 5.0±0.8  | 7.6    | 3.0    | 0.8±0.02 | 2                 | 1        |
| PTR060V0185 | 17.8   | 22.9            | 22.9        | 5.0±0.8  | 7.6    | 3.0    | 0.8±0.02 | 2                 | 1        |
| PTR060V0250 | 21.3   | 26.4            | 26.4        | 10.0±0.8 | 7.6    | 3.0    | 0.8±0.02 | 2                 | 1        |
| PTR060V0300 | 24.9   | 30.0            | 30.0        | 10.0±0.8 | 7.6    | 3.0    | 0.8±0.02 | 2                 | 1        |
| PTR060V0375 | 28.4   | 33.5            | 33.5        | 10.0±0.8 | 7.6    | 3.0    | 0.8±0.02 | 2                 | 1        |

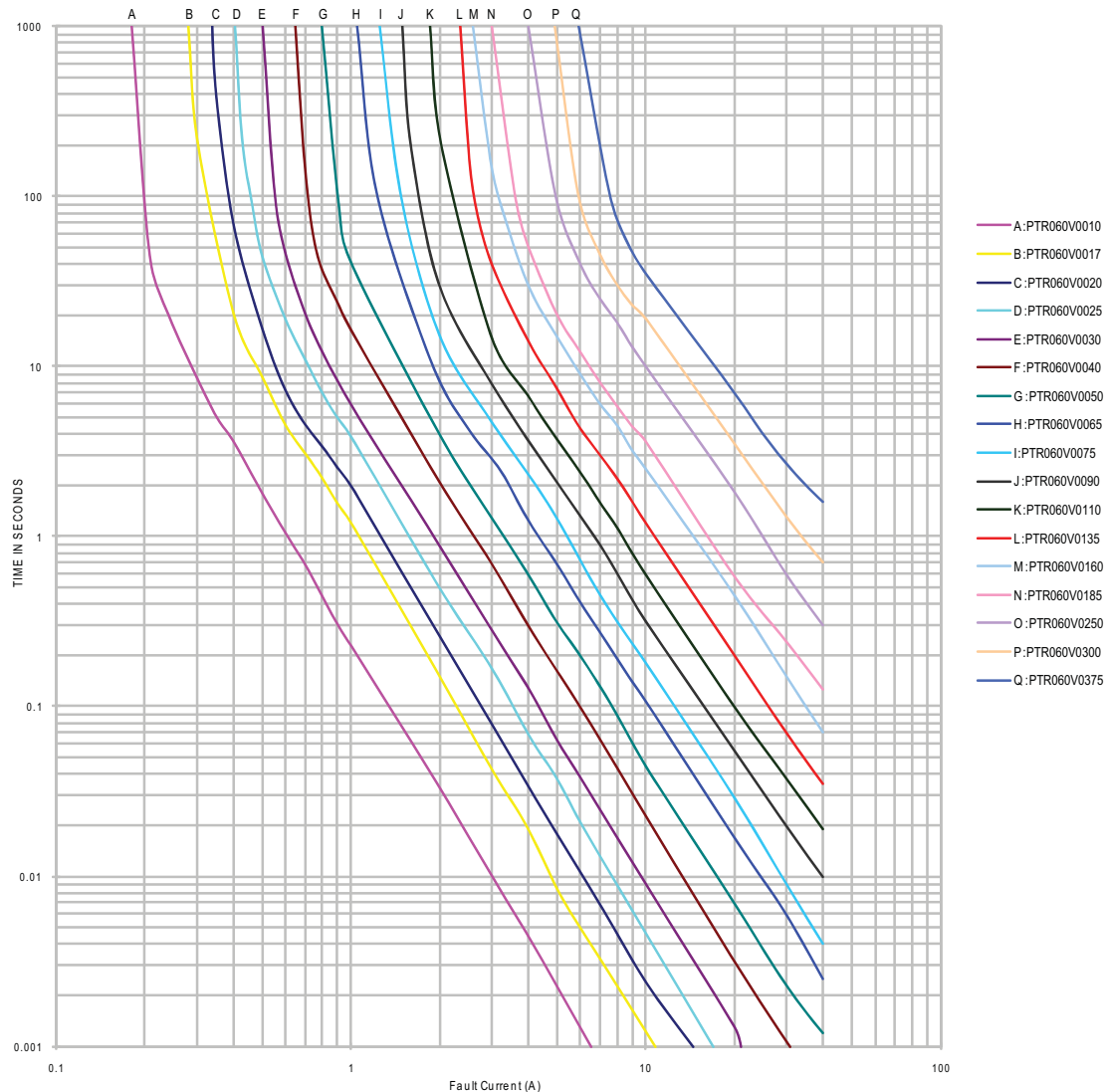
Style 1



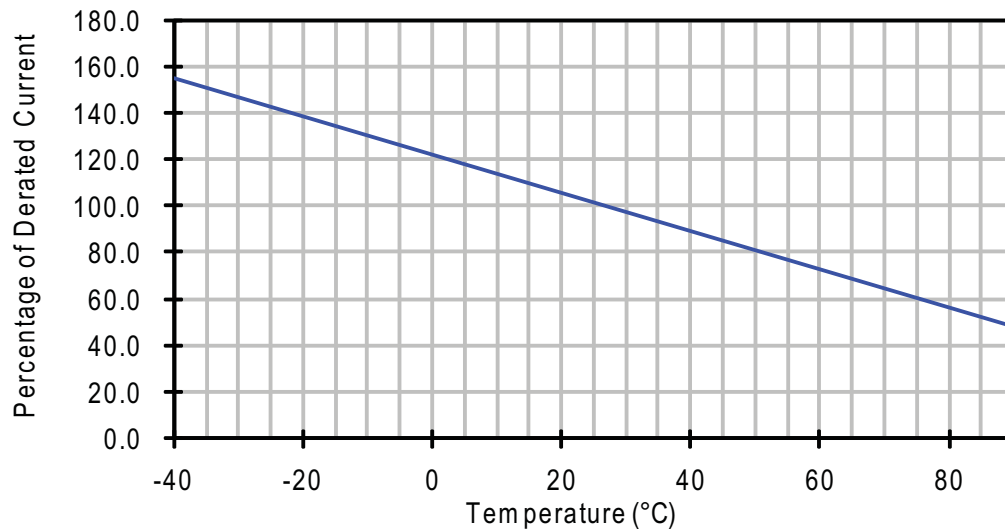
Style 2



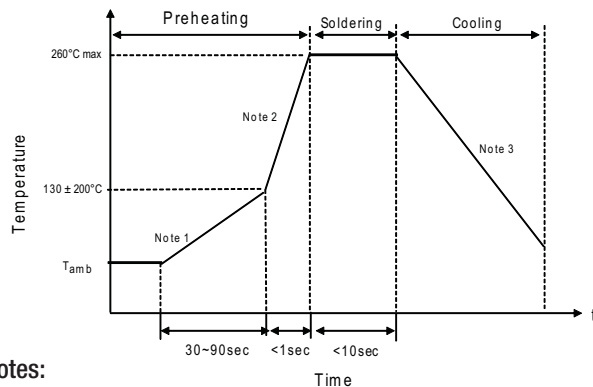
## Time-to-Trip Curves at 23°C



## 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:
  - PTR060V0010-PTR060V0040 Tin-plated copper clad steel
  - PTR060V0050-PTR060V0375 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 P0 12.7 0.3                                |                |                |                |
| Ordinate to adjacent component lead<br>PTR060V0010~PTR060V0090 | P <sub>1</sub> | 3.6            | ±1.0           |
| Ordinate to adjacent component lead<br>PTR060V0110~PTR060V0185 | P <sub>1</sub> | 3.45           | ±1.0           |
| Ordinate to adjacent component lead<br>PTR060V0250~PTR060V0300 | P <sub>1</sub> | 7.3            | ±1.0           |
| Device pitch PTR060V0010~PTR060V0090                           | P              | 12.7           | ±1.0           |
| Device pitch PTR060V0110~PTR060V0300                           | P              | 25.4           | ±1.0           |
| Device pitch PTR060V0375                                       | P              | 38.1           | ±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 PTR060V0010~PTR060V0090                        | H <sub>1</sub> | 32.2           | Max.           |
| Abscissa to top PTR060V0110~PTR060V0300                        | 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                                         | Δh             | 0              | ±1.0           |
| Body tape plane deviation                                      | Δp             | 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 - PTR060V0010-PTR060V0185

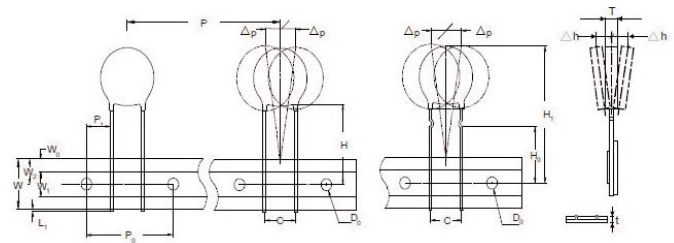
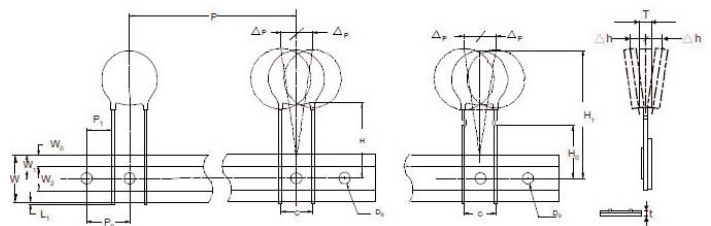
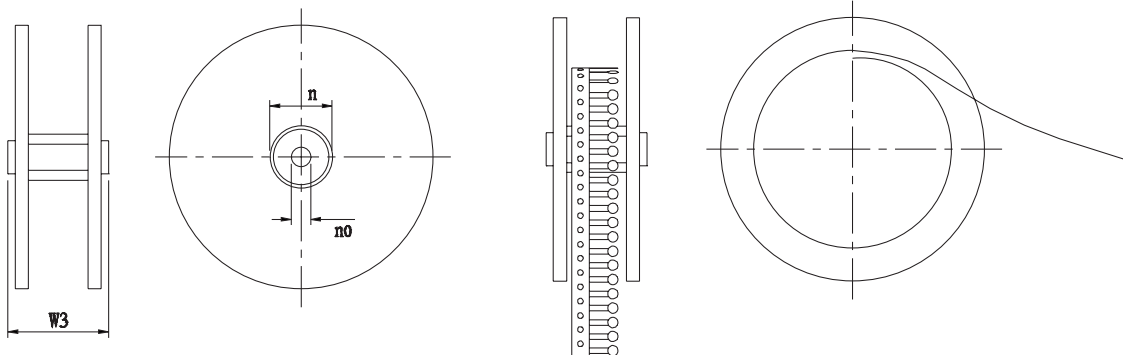


Figure 2 - PTR060V0250-PTR060V0375



## Reel Specifications



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