

# PTR016V

## 16 Volt DC radial leaded, PolyTron™ PTC devices



### Product features

- PolyTron™ radial leaded thru-hole PTC device
- Maximum 16 V
- Current ratings from 0.9 A to 15 A
- Fast time-to-trip
- Low resistance
- Halogen free, lead free, RoHS compliant

### Applications

- Medical equipment
- Telecommunications
- White goods
- Computers and peripherals

### Agency information

- cURus: Recognized Card: File E343021 (Ihold 3A-15 A)
- TUV File: J 50194729

### Ordering information/ part number system



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

#### TR & TR1 On Reels

- 0.9-1.85 A - 3000 devices
- 2.5-4 A - 2500 devices
- 5-7 A - 1500 devices
- 8-15 A - 1000 devices

#### BK & BK1 In Poly Bags

- 0.9-1.60 A - 1000 devices
- 1.85-9.00 A - 500 devices
- 10.00-15.00 A - 250 devices

### Specifications

| Catalog Number | V <sub>max</sub> (Vdc) | I <sub>max</sub> (A) | I <sub>hold</sub> @ +23 °C (A) | I <sub>trip</sub> @ +23 °C (A) | Pd Typ. (W) | Time to Trip (Max.) |       | Resistance (Ω)            |       |                             | Agency Information |     |
|----------------|------------------------|----------------------|--------------------------------|--------------------------------|-------------|---------------------|-------|---------------------------|-------|-----------------------------|--------------------|-----|
|                |                        |                      |                                |                                |             | (A)                 | (sec) | Initial (R <sub>i</sub> ) |       | Post Trip (R <sub>t</sub> ) | cURus              | TUV |
|                |                        |                      |                                |                                |             |                     |       | Min.                      | Max.  |                             |                    |     |
| PTR016V0090    | 16                     | 40                   | 0.90                           | 1.80                           | 0.60        | 8.00                | 1.20  | 0.070                     | 0.120 | 0.180                       |                    | X   |
| PTR016V0110    | 16                     | 40                   | 1.10                           | 2.20                           | 0.70        | 8.00                | 2.30  | 0.050                     | 0.095 | 0.140                       |                    | X   |
| PTR016V0135    | 16                     | 40                   | 1.35                           | 2.70                           | 0.80        | 8.00                | 4.50  | 0.040                     | 0.074 | 0.120                       |                    | X   |
| PTR016V0160    | 16                     | 40                   | 1.60                           | 3.20                           | 0.90        | 8.00                | 9.00  | 0.030                     | 0.061 | 0.110                       |                    | X   |
| PTR016V0185    | 16                     | 40                   | 1.85                           | 3.70                           | 1.00        | 8.00                | 10.00 | 0.030                     | 0.051 | 0.090                       |                    | X   |
| PTR016V0250    | 16                     | 40                   | 2.50                           | 5.00                           | 1.20        | 8.00                | 40.00 | 0.020                     | 0.036 | 0.070                       |                    | X   |
| PTR016V0300    | 16                     | 100                  | 3.00                           | 5.10                           | 2.30        | 15.00               | 1.00  | 0.038                     | 0.065 | 0.098                       | X                  | X   |
| PTR016V0400    | 16                     | 100                  | 4.00                           | 6.80                           | 2.40        | 20.00               | 1.70  | 0.021                     | 0.038 | 0.060                       | X                  | X   |
| PTR016V0500    | 16                     | 100                  | 5.00                           | 8.50                           | 2.60        | 25.00               | 2.00  | 0.010                     | 0.023 | 0.034                       | X                  | X   |
| PTR016V0600    | 16                     | 100                  | 6.00                           | 10.20                          | 2.80        | 30.00               | 3.30  | 0.006                     | 0.018 | 0.028                       | X                  | X   |
| PTR016V0700    | 16                     | 100                  | 7.00                           | 11.90                          | 3.00        | 35.00               | 3.50  | 0.006                     | 0.013 | 0.020                       | X                  | X   |
| PTR016V0800    | 16                     | 100                  | 8.00                           | 13.60                          | 3.00        | 40.00               | 5.00  | 0.005                     | 0.011 | 0.018                       | X                  | X   |
| PTR016V0900    | 16                     | 100                  | 9.00                           | 15.30                          | 3.30        | 45.00               | 5.50  | 0.005                     | 0.009 | 0.014                       | X                  | X   |
| PTR016V1000    | 16                     | 100                  | 10.00                          | 17.00                          | 3.60        | 50.00               | 6.00  | 0.004                     | 0.007 | 0.010                       | X                  | X   |
| PTR016V1100    | 16                     | 100                  | 11.00                          | 18.70                          | 3.70        | 55.00               | 7.00  | 0.003                     | 0.006 | 0.009                       | X                  | X   |
| PTR016V1200    | 16                     | 100                  | 12.00                          | 20.40                          | 4.20        | 60.00               | 7.50  | 0.003                     | 0.006 | 0.009                       | X                  | X   |
| PTR016V1300    | 16                     | 100                  | 13.00                          | 22.10                          | 4.60        | 65.00               | 8.50  | 0.002                     | 0.006 | 0.008                       | X                  | X   |
| PTR016V1400    | 16                     | 100                  | 14.00                          | 23.80                          | 4.60        | 70.00               | 9.00  | 0.002                     | 0.005 | 0.007                       | X                  | X   |
| PTR016V1500    | 16                     | 100                  | 15.00                          | 25.50                          | 4.60        | 75.00               | 10.00 | 0.002                     | 0.005 | 0.007                       | 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.
  - Pd: 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>t</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.



Powering Business Worldwide

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 |
| PTR016V0090 | 7.4    | 12.2            | 12.2        | 5.0±0.8  | 7.6    | 3.5    | 0.5±0.02 | 2                 | 1        |
| PTR016V0110 | 7.4    | 14.2            | 14.2        | 5.0±0.8  | 7.6    | 3.5    | 0.5±0.02 | 2                 | 1        |
| PTR016V0135 | 8.9    | 13.5            | 13.5        | 5.0±0.8  | 7.6    | 3.5    | 0.5±0.02 | 2                 | 1        |
| PTR016V0160 | 8.9    | 15.2            | 15.2        | 5.0±0.8  | 7.6    | 3.5    | 0.5±0.02 | 2                 | 1        |
| PTR016V0185 | 10.2   | 15.7            | 15.7        | 5.0±0.8  | 7.6    | 3.5    | 0.5±0.02 | 2                 | 1        |
| PTR016V0250 | 11.4   | 18.3            | 20.5        | 5.0±0.8  | 7.6    | 3.5    | 0.5±0.02 | 2                 | 1        |
| PTR016V0300 | 7.1    | 11.0            | 14.0        | 5.0±0.8  | 7.6    | 3.5    | 0.8±0.02 | 2                 | 1        |
| PTR016V0400 | 8.9    | 12.8            | 14.8        | 5.0±0.8  | 7.6    | 3.5    | 0.8±0.02 | 2                 | 1        |
| PTR016V0500 | 10.4   | 14.3            | 16.0        | 5.0±0.8  | 7.6    | 3.5    | 0.8±0.02 | 2                 | 1        |
| PTR016V0600 | 10.7   | 17.1            | 19.0        | 5.0±0.8  | 7.6    | 3.5    | 0.8±0.02 | 2                 | 1        |
| PTR016V0700 | 11.2   | 19.7            | 22.0        | 5.0±0.8  | 7.6    | 3.5    | 0.8±0.02 | 2                 | 1        |
| PTR016V0800 | 12.7   | 20.9            | 23.0        | 5.0±0.8  | 7.6    | 3.5    | 0.8±0.02 | 2                 | 1        |
| PTR016V0900 | 14.0   | 21.9            | 24.0        | 5.0±0.8  | 7.6    | 3.5    | 0.8±0.02 | 2                 | 1        |
| PTR016V1000 | 16.5   | 25.2            | 28.0        | 5.0±0.8  | 7.6    | 3.5    | 0.8±0.02 | 2                 | 1        |
| PTR016V1100 | 17.5   | 26.0            | 29.0        | 5.0±0.8  | 7.6    | 3.5    | 0.8±0.02 | 2                 | 1        |
| PTR016V1200 | 17.5   | 28.0            | 31.0        | 10.0±0.8 | 7.6    | 3.5    | 1.0±0.02 | 2                 | 1        |
| PTR016V1300 | 21.6   | 29.2            | 32.0        | 10.0±0.8 | 7.6    | 3.5    | 1.0±0.02 | 2                 | 1        |
| PTR016V1400 | 23.5   | 27.9            | 30.0        | 10.0±0.8 | 7.6    | 3.5    | 1.0±0.02 | 2                 | 1        |
| PTR016V1500 | 25.1   | 29.0            | 32.0        | 10.0±0.8 | 7.6    | 3.5    | 1.0±0.02 | 2                 | 1        |



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: |                |                |                |
| PTR016V0090~PTR016V0250              | P <sub>1</sub> | 3.6            | ±1.0           |
| PTR016V0300~PTR016V1100              | P <sub>1</sub> | 4.5            | ±1.0           |
| PTR016V1200~PTR016V1500              | P <sub>1</sub> | 7.2            | ±1.0           |
| Device pitch:                        |                |                |                |
| PTR016V0090~PTR016V0600              | P              | 12.7           | ±1.0           |
| PTR016V0700~PTR016V1400              | P              | 25.4           | ±1.0           |
| PTR016V1500                          | 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:                     |                |                |                |
| PTR016V0090~PTR016V0600              | H <sub>1</sub> | 32.2           | Max.           |
| PTR016V0700~PTR016V1500              | H <sub>1</sub> | 47.5           | Max.           |
| Abscissa to plane                    |                |                |                |
| (straight lead)                      | H              | 18.0           | +2/-0          |
| (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              | ±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.

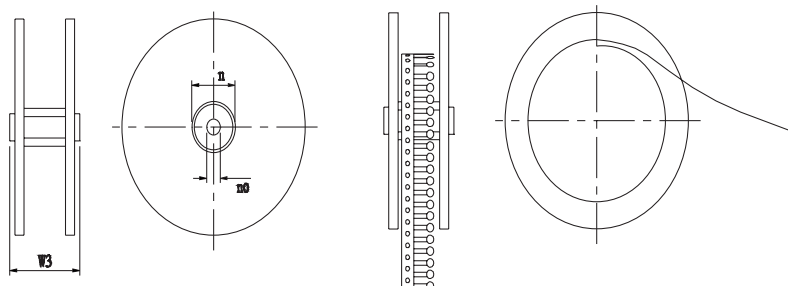
Style 1 - PTR016V0090, PTR016V0110, PTR016V0135, PTR016V0160-PTR016V1000



Style 2 - PTR016V1200-PTR016V1500



Reel Specifications



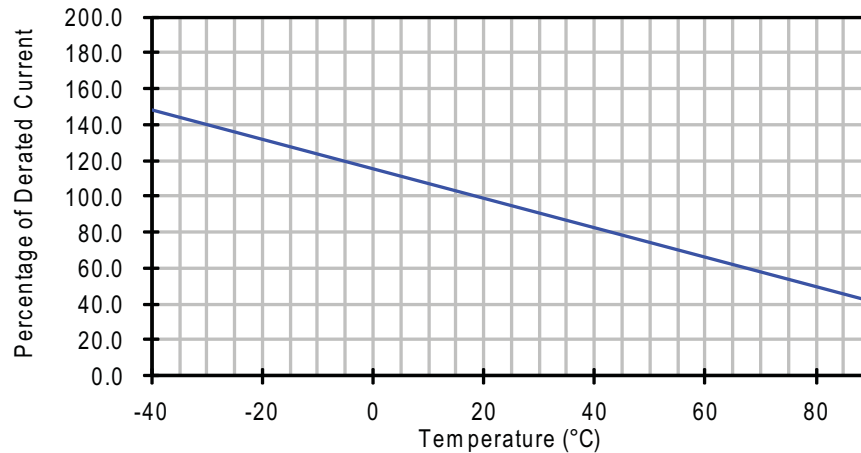
Time-to-Trip Curves at +23 °C - 0.9-2.5 A



Time-to-Trip Curves at +23 °C - 3.0-15 A



**Thermal Derating Curve**



**Recommended Wave Solder Profile**



**Notes:**

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

**Recommended Reworking Conditions with Soldering Iron**

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

| 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,<br>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  |

**Material Composition**

- Lead material:
  - PTR016V0090-PTR016V0250 Tin-plated copper clad steel
  - PTR016V0300-PTR016V1500 Tin-plated copper
- Insulating material: Cured epoxy resin meeting UL 94V0 requirements

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 Printed in USA  
 Publication No. 4399 BU-SB111164  
 October 2017