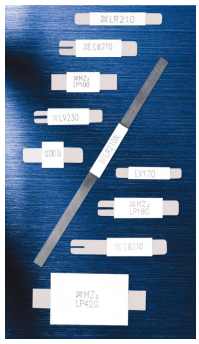
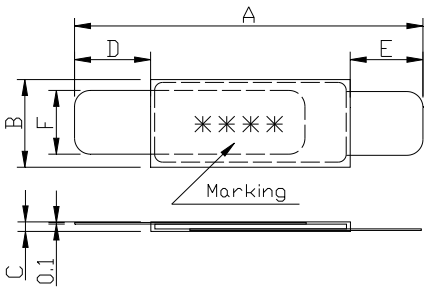
# Polymer PTC Resettable Fuse For Battery Protection LP Series

## Features

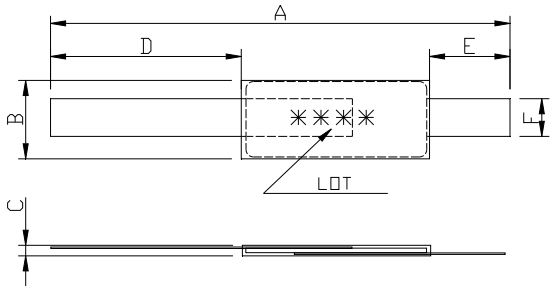


- Strap devices, Axial leaded
- Protection for NiCd/NiMH rechargeable battery packs, Li-ion /Polymer Li-ion battery
- Available in lead-free version
- Agency recognition: UL、CSA、TUV

## Product Dimensions




Standard style




Special-style

Unit: mm

**LP Series (1)**

| Part number | A | | B | | C | | D | | E | | F | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max |
| LP120 | 17.0 | 20.1 | 4.9 | 5.5 | 0.5 | 1.0 | 3.5 | 6.2 | 3.5 | 6.2 | 3.8 | 4.2 |
| LP175 | 20.9 | 23.1 | 4.9 | 5.5 | 0.5 | 1.0 | 3.0 | 6.0 | 3.0 | 6.0 | 3.8 | 4.2 |
| LP200 | 20.9 | 23.4 | 7.9 | 8.4 | 0.5 | 1.0 | 4.0 | 7.6 | 4.0 | 7.6 | 4.8 | 5.4 |
| LP260 | 20.9 | 23.1 | 7.9 | 8.4 | 0.5 | 1.0 | 4.0 | 7.6 | 4.0 | 7.6 | 4.8 | 5.4 |
| LP350 | 25.0 | 28.4 | 12.8 | 13.5 | 0.5 | 1.0 | 4.0 | 8.0 | 4.0 | 8.0 | 4.9 | 5.1 |
| LP380 | 24.0 | 26.0 | 7.1 | 7.6 | 0.5 | 1.0 | 4.1 | 5.5 | 4.1 | 6.0 | 4.9 | 5.1 |
| LP420 | 29.6 | 32.4 | 12.9 | 13.6 | 0.5 | 1.0 | 5.0 | 7.5 | 5.0 | 7.5 | 4.9 | 5.1 |
| LP450 | 24.0 | 26.0 | 9.9 | 10.5 | 0.5 | 1.0 | 5.0 | 6.7 | 5.0 | 6.7 | 5.9 | 6.1 |
| LP550 | 35.0 | 37.0 | 7.1 | 7.6 | 0.5 | 1.0 | 5.0 | 6.9 | 5.0 | 6.9 | 4.9 | 5.1 |
| LP600 | 24.0 | 26.0 | 13.4 | 14.0 | 0.5 | 1.0 | 5.0 | 6.9 | 5.0 | 6.9 | 5.9 | 6.1 |
| LP730 | 26.0 | 29.1 | 13.9 | 14.5 | 0.5 | 1.0 | 4.0 | 6.0 | 4.0 | 6.0 | 5.9 | 6.1 |
| LP900 | 45.0 | 48.0 | 7.9 | 8.5 | 0.5 | 1.0 | 4.0 | 7.0 | 4.0 | 7.0 | 5.9 | 6.1 |
| LP1410 | 58.0 | 60.0 | 13.4 | 14.0 | 0.5 | 1.0 | 5.0 | 7.0 | 5.0 | 7.0 | 5.9 | 6.1 |

**LP Series (2)**

| Part number | A | | B | | C | | D | | E | | F | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max | Min | Max |
| LP070 | 17.0 | 20.1 | 4.9 | 5.5 | 0.5 | 1.0 | 3.5 | 6.2 | 3.5 | 6.2 | 3.8 | 4.2 |
| LP100 | 17.0 | 20.1 | 4.9 | 5.5 | 0.5 | 1.0 | 3.5 | 6.2 | 3.5 | 6.2 | 3.8 | 4.2 |
| LP180 | 20.9 | 23.1 | 4.9 | 5.5 | 0.5 | 1.0 | 3.0 | 6.0 | 3.0 | 6.0 | 3.8 | 4.2 |
| LP190 | 20.9 | 23.4 | 7.9 | 8.4 | 0.5 | 1.0 | 4.0 | 7.6 | 4.0 | 7.6 | 4.8 | 5.4 |
| LP260 | 20.9 | 23.1 | 7.9 | 8.4 | 0.5 | 1.0 | 4.0 | 7.6 | 4.0 | 7.6 | 4.8 | 5.4 |
| LP300 | 25.4 | 28.5 | 13.0 | 13.7 | 0.5 | 1.0 | 4.0 | 7.3 | 4.0 | 7.3 | 4.8 | 5.4 |
| LP340 | 25.4 | 28.5 | 13.0 | 13.7 | 0.5 | 1.0 | 4.0 | 7.3 | 4.0 | 7.3 | 4.8 | 5.4 |

## Thermal Derating Chart-IH(A)

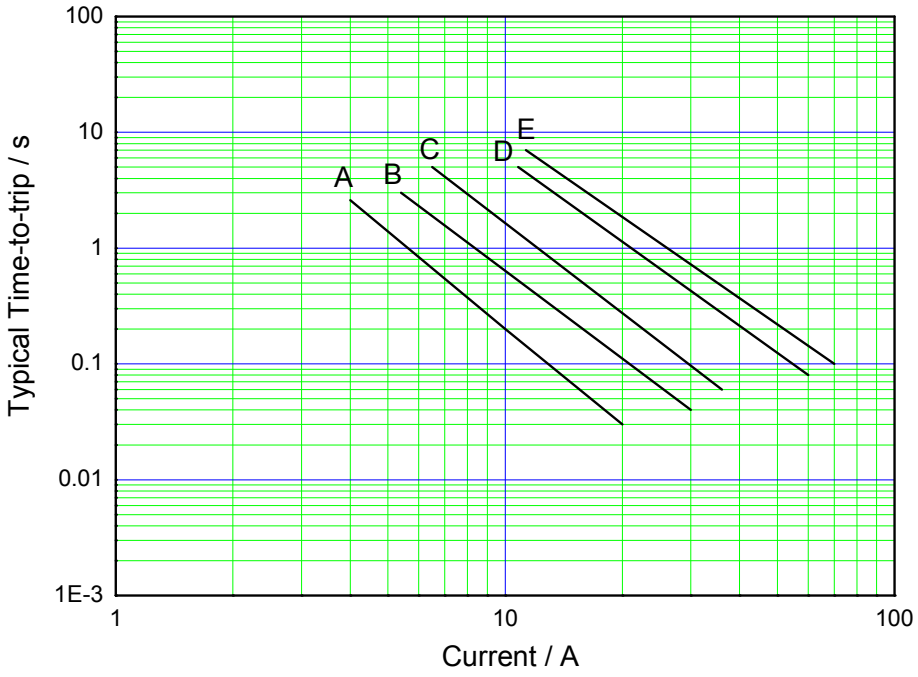
**LP Series (1)**

| Part number | Maximum ambient operating temperatures(℃) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | -40 | -20 | 0 | 20 | 25 | 40 | 50 | 60 | 70 | 80 | 85 |
| LP120 | 1.9 | 1.7 | 1.5 | 1.2 | 1.17 | 1.0 | 0.9 | 0.8 | 0.6 | 0.5 | 0.4 |
| LP175 | 2.5 | 2.2 | 2.0 | 1.75 | 1.68 | 1.4 | 1.3 | 1.2 | 1.0 | 0.9 | 0.8 |
| LP200 | 3.1 | 2.8 | 2.5 | 2.0 | 1.97 | 1.7 | 1.5 | 1.4 | 1.2 | 1.0 | 0.9 |
| LP260 | 3.8 | 3.4 | 3.1 | 2.6 | 2.54 | 2.2 | 2.0 | 1.9 | 1.7 | 1.4 | 1.3 |
| LP350 | 5.3 | 4.8 | 4.3 | 3.5 | 3.44 | 3.0 | 2.7 | 2.5 | 2.1 | 1.8 | 1.7 |
| LP380 | 5.4 | 4.9 | 4.4 | 3.8 | 3.64 | 3.3 | 3.0 | 2.8 | 2.5 | 2.3 | 2.1 |
| LP420 | 6.3 | 5.7 | 5.1 | 4.2 | 4.11 | 3.6 | 3.3 | 3.0 | 2.6 | 2.2 | 2.1 |
| LP450 | 6.5 | 5.8 | 5.3 | 4.5 | 4.38 | 3.9 | 3.6 | 3.3 | 2.9 | 2.6 | 2.4 |
| LP550 | 7.6 | 6.9 | 6.2 | 5.5 | 5.32 | 4.7 | 4.3 | 4.0 | 3.6 | 3.2 | 3.0 |
| LP600 | 8.7 | 7.8 | 7.1 | 6.0 | 5.86 | 5.2 | 4.7 | 4.4 | 3.9 | 3.4 | 3.2 |
| LP730 | 10.5 | 9.5 | 8.6 | 7.3 | 7.13 | 6.3 | 5.7 | 5.4 | 4.7 | 4.2 | 4.0 |
| LP900 | 12.7 | 11.4 | 10 | 9.0 | 8.5 | 7.5 | 6.8 | 6.2 | 5.5 | 4.9 | 4.5 |
| LP1410 | 19.9 | 17.8 | 15.7 | 14.1 | 13.3 | 11.8 | 10.8 | 9.7 | 8.7 | 7.7 | 7.2 |

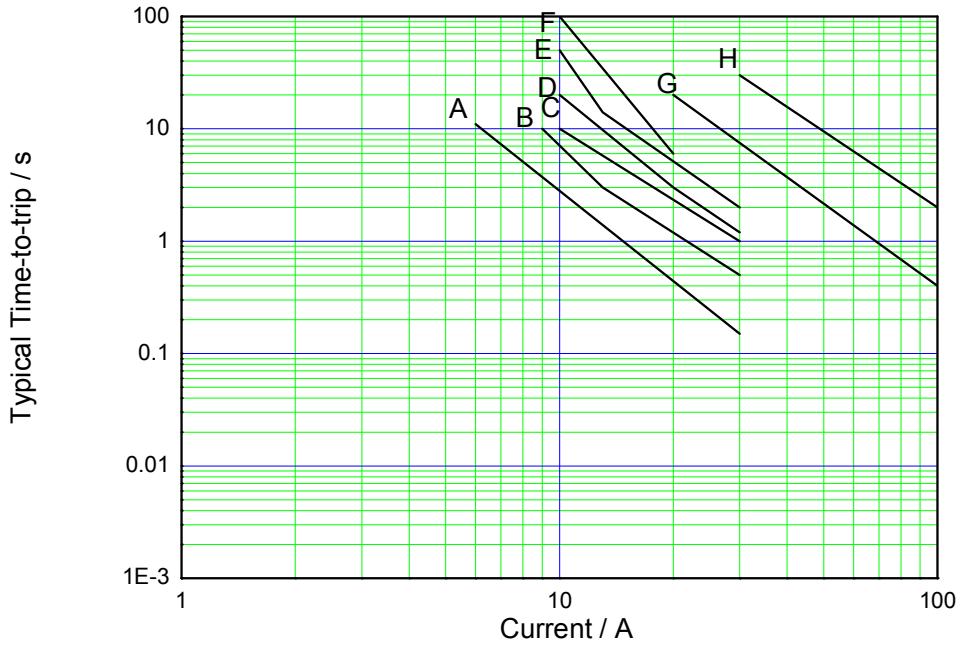
**LP Series (2)**

| Part number | Maximum ambient operating temperatures(℃) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | -40 | -20 | 0 | 20 | 25 | 40 | 50 | 60 | 70 | 80 | 85 |
| LP070 | 1.1 | 1.0 | 0.8 | 0.7 | 0.65 | 0.5 | 0.4 | 0.3 | 0.2 | 0.2 | 0.1 |
| LP100 | 1.8 | 1.6 | 1.4 | 1.0 | 0.99 | 0.8 | 0.7 | 0.6 | 0.4 | 0.3 | 0.2 |
| LP180 | 3.1 | 2.6 | 2.2 | 1.8 | 1.67 | 1.3 | 1.1 | 0.9 | 0.6 | 0.4 | 0.3 |
| LP190 | 3.3 | 2.8 | 2.4 | 1.9 | 1.79 | 1.4 | 1.2 | 1.1 | 0.7 | 0.5 | 0.4 |
| LP260 | 4.3 | 3.7 | 3.1 | 2.6 | 2.42 | 1.9 | 1.6 | 1.4 | 1.1 | 0.8 | 0.6 |
| LP300 | 5.1 | 4.4 | 3.7 | 3.0 | 2.82 | 2.3 | 1.9 | 1.6 | 1.2 | 0.9 | 0.7 |
| LP340 | 5.5 | 4.7 | 4.0 | 3.4 | 3.17 | 2.6 | 2.2 | 1.9 | 1.5 | 1.1 | 0.9 |

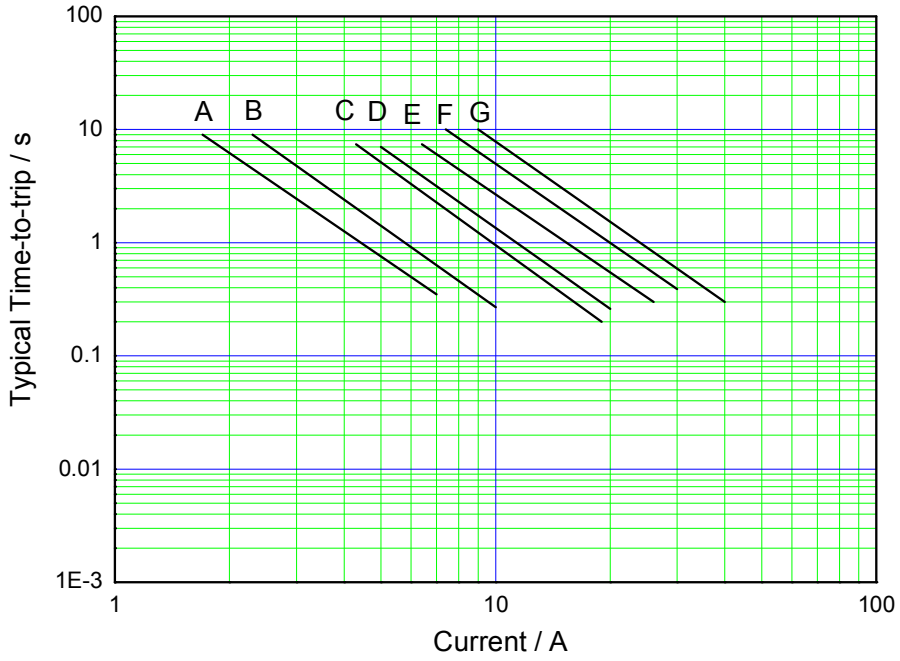
## Typical Time-to-Trip Charts at 25℃




A---LP120
B---LP175
C---LP200
D---LP350
E---LP420




A---LP260
B---LP380
C---LP450
D---LP550
E---LP600
F---LP730
G----LP900
H---LP1410




A---LP070
B---LP100
C---LP180
D---LP190
E---LP260
F---LP300
G---LP340

## Electrical Characteristic

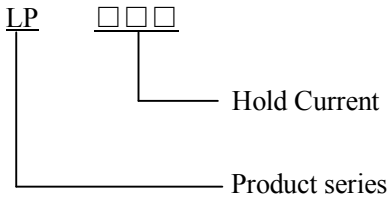
**LP Series (1)**

| Part number | $I_H$ | $I_T$ | $V_{max}$ | $I_{max}$ | $P_d$ | $I_{trip}$ | $T_{trip}$ | $R_{min}$ | $R_{max}$ | $R_{1max}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| | (A) | (A) | (V) | (A) | (W) | Current (A) | Time (S) | (Ω) | (Ω) | (Ω) |
| LP120 | 1.2 | 2.7 | 15 | 100 | 0.8 | 6.0 | 5.0 | 0.085 | 0.160 | 0.220 |
| LP175 | 1.75 | 3.8 | 15 | 100 | 0.9 | 8.75 | 5.0 | 0.050 | 0.090 | 0.120 |
| LP200 | 2.0 | 4.4 | 30 | 100 | 1.6 | 10.0 | 4.0 | 0.030 | 0.060 | 0.100 |
| LP260 | 2.6 | 5.8 | 15 | 100 | 1.0 | 13.0 | 5.0 | 0.020 | 0.042 | 0.063 |
| LP350 | 3.5 | 6.3 | 30 | 100 | 1.9 | 20.0 | 3.0 | 0.017 | 0.031 | 0.050 |
| LP380 | 3.8 | 8.3 | 15 | 100 | 1.2 | 19.0 | 5.0 | 0.013 | 0.026 | 0.037 |
| LP420 | 4.2 | 7.6 | 30 | 100 | 2.2 | 20.0 | 6.0 | 0.012 | 0.024 | 0.040 |
| LP450 | 4.5 | 8.9 | 20 | 100 | 1.4 | 22.5 | 5.0 | 0.011 | 0.020 | 0.028 |
| LP550 | 5.5 | 10.5 | 20 | 100 | 2.0 | 27.5 | 5.0 | 0.009 | 0.016 | 0.022 |
| LP600 | 6.0 | 11.7 | 20 | 100 | 1.7 | 30.0 | 5.0 | 0.007 | 0.014 | 0.019 |
| LP730 | 7.3 | 14.1 | 20 | 100 | 1.9 | 30.0 | 5.0 | 0.006 | 0.012 | 0.015 |
| LP900 | 9.0 | 16.7 | 20 | 100 | 3.0 | 45.0 | 5.0 | 0.006 | 0.010 | 0.014 |
| LP1410 | 14.1 | 26.2 | 20 | 100 | 2.2 | 70.0 | 5.0 | 0.003 | 0.005 | 0.007 |

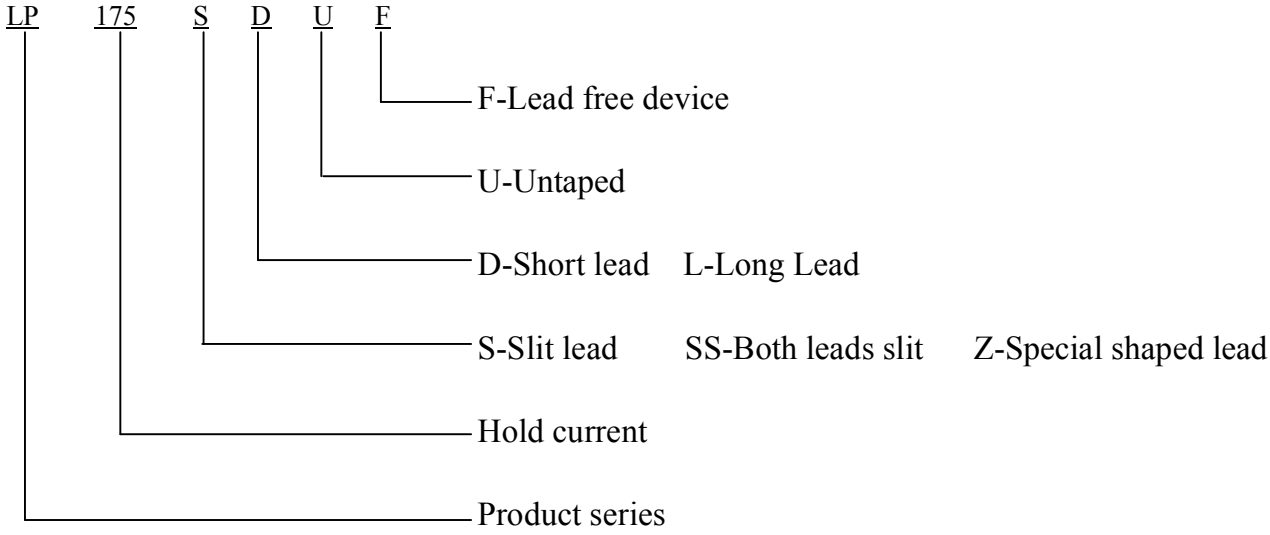
**LP Series (2)**

| Part number | $I_H$ | $I_T$ | $V_{max}$ | $I_{max}$ | $P_d$ | $T_{trip}$ | | $R_{min}$ | $R_{max}$ | $R_{1max}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| | (A) | (A) | (V) | (A) | (W) | Current (A) | Time (S) | (Ω) | (Ω) | (Ω) |
| LP070 | 0.7 | 1.45 | 15 | 100 | 0.7 | 3.5 | 5.0 | 0.100 | 0.200 | 0.340 |
| LP100 | 1.0 | 2.50 | 24 | 100 | 0.9 | 5.0 | 7.0 | 0.070 | 0.130 | 0.260 |
| LP180 | 1.8 | 3.80 | 24 | 100 | 1.0 | 9.0 | 2.9 | 0.040 | 0.068 | 0.120 |
| LP190 | 1.9 | 4.20 | 24 | 100 | 1.9 | 10.0 | 3.0 | 0.030 | 0.057 | 0.100 |
| LP260 | 2.6 | 5.20 | 24 | 100 | 1.3 | 13.0 | 5.0 | 0.025 | 0.042 | 0.076 |
| LP300 | 3.0 | 6.30 | 24 | 100 | 1.7 | 15.0 | 4.0 | 0.015 | 0.031 | 0.055 |
| LP340 | 3.4 | 6.80 | 24 | 100 | 1.6 | 17.0 | 5.0 | 0.016 | 0.027 | 0.050 |

## Marking System




## Part Numbering System




## Test Procedures And Requirements

| Test | Test Conditions | Accept/Reject Criteria |
|---|---|---|
| Resistance | In still air @ 25℃ | $R_{min} \leqslant R \leqslant R_{max}$ |
| Time to Trip | Specified current, $V_{max}$, 25℃ | T≤maximum Time to Trip |
| Hold Current | 30min, at $I_H$ | No trip |
| Trip Cycle Life | $V_{max}$, $I_{max}$, 100cycles | No arcing or burning |
| Trip Endurance | $V_{max}$, 24hours | No arcing or burning |

## Physical Characteristics and Environmental Specifications

**Physical Characteristics**

| | |
|---|---|
| Lead material | 0.125mm nominal thickness,quarter-hard nickel |
| Tape material | Polyester |

**Environmental Specifications**

| Test | Conditions | Resistance Change |
|---|---|---|
| Passive aging | 70℃,1000hours | ±10% |
| Humidity aging | 85℃/85% RH,7days | ±5% |
| Vibration | MIL-STD-883C,Test Condition A | No change |

## Electrical Specifications:

$I_H$=Hold current: maximum current at which the device will not trip at 25℃ still air.

$I_T$=Trip current: minimum current at which the device will always trip at 25℃ 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.

$T_{trip}$=Maximum time to trip(s) at assigned current.

**Pd**=Typical power dissipation: typical amount of power dissipated by the device when in state air environment.

$R_{min}$=Minimum device resistance at 25℃ prior to tripping.

$R_{max}$=Maximum device resistance at 25℃ prior to tripping.

## Packaging and Storage

### Packaging

Bulk, 500/1000pcs per bag

### Storage

The maximum ambient temperature shall not exceed 40℃. Storage temperatures higher than 40℃ could result in the deformation of packaging materials. The maximum relative humidity recommended for storage is 70%. High humidity with high temperature can accelerate the oxidation of the solder plating on the termination and reduce the solderability of the components. Sealed plastic bags with desiccant shall be used to reduce the oxidation of the termination and shall only be opened prior to use. The products shall not be stored in areas where harmful gases containing sulfur or chlorine are present.

**Warning:**
PPTC devices are intended for protection against occasional over-current or over-temperature fault conditions, and should not be used when repeated fault conditions are anticipated. Operation beyond maximum ratings or improper use may result in device damage and possible electrical arcing and flame.

**Notes:**
The specification is intended to present application, product and technical data to assist the user in selecting PPTC circuit production devices. However, users should independently evaluate and test the suitability of each product. Wayon makes no warranties as to the accuracy or completeness of the information and disclaims any liability resulting from its use. Wayon's only obligations are those in the Wayon Standard Terms and Conditions of Sale and in no case will Wayon be liable for any incidental, indirect, or consequential damages arising from the sale, resale, or misuse of its products. Wayon reserves the right to change or update, without notice, any information contained in this specification.