

PTC Thermistor Inrush Current Limiter

PTCL

60~1000 Ω R_{25}

500~1000 V_{DC} $V_{linkmax}$

350~700 V_{rms} V_{max}

1.45~2.3 J/K C_{th}



Applications

AC/DC and DC/DC converters / Load dump and DC-Link circuits
OBC / Battery charging equipment / Motor drives

Outstanding High-Voltage Capability, High Stability and Reliability

Wide working temperature range



Introduction

The PTCL series is a high-performance PTC thermistor inrush current limiter introduced by C&B Electronics. This series is specifically designed to handle transient current surges in high-voltage power conversion and new energy systems, serving as a core component for efficient and reliable pre-charge protection.

The PTCL series utilizes the positive temperature coefficient (PTC) characteristics of ceramic materials to limit inrush currents through its initial resistance at the moment of circuit startup. When an abnormal overcurrent causes the component's temperature to reach the Curie temperature ($+140\pm 10^{\circ}\text{C}$), its resistance increases exponentially, thereby restricting the current to an extremely low level and effectively protecting downstream capacitors and power devices from damage.

Outstanding High-Voltage Capability: With $V_{linkmax}$ ranging from $500V_{DC}$ to $1000V_{DC}$, it easily meets the requirements of high-voltage power battery systems and industrial power environments.

Diverse Specification Options: R_{25} values range from 60Ω to 1000Ω , combined with a high heat capacity (C_{th}) of up to 2.3J/K , providing precise matching solutions for circuit designs with various power densities.

If you have any customization needs beyond this document, feel free to contact us at the following email address: resi@cbeureka.com



Electrical Parameters

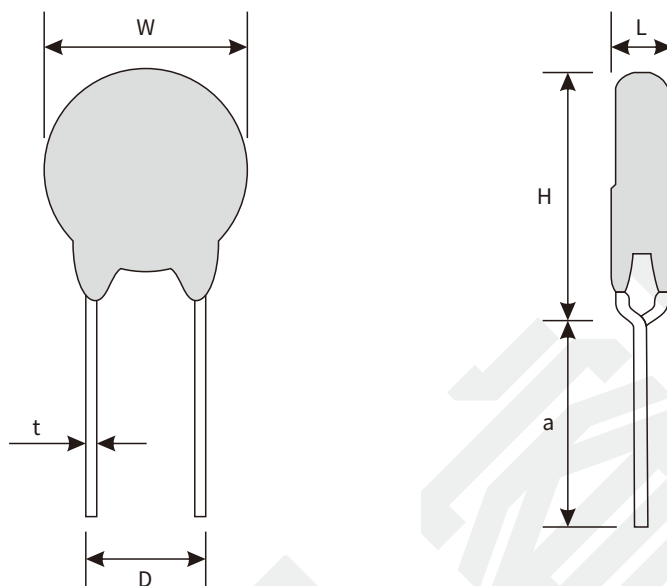
Size	$R_{25}^{[1]}$ (Ω)	$R_{25}\text{TOL.}$ (%)	$TC^{[2]}$ ($^{\circ}\text{C}$)	$V_{max.}$ (V_{rms})	$V_{linkmax.}$ (V_{DC})	C_{th} (J/K)	τ_{th} (s)	Operating Temp. Range ($^{\circ}\text{C}$)
PTCL0850N1K00Y5	1000	30	140 ± 10	$600V_{AC}$	850	≈ 1.45	≈ 130	$-40\sim +105$
PTCL0500N60R0Y5	60	30	140 ± 10	$350V_{AC}$	500	≈ 1.45	≈ 130	$-40\sim +105$
PTCL0625N120RY5	120	30	140 ± 10	$440V_{AC}$	625	≈ 1.45	≈ 130	$-40\sim +105$
PTCL0680N250RY5	250	30	140 ± 10	$480V_{AC}$	680	≈ 1.45	≈ 130	$-40\sim +105$
PTCL0800N500RY5	500	30	140 ± 10	$560V_{AC}$	800	≈ 1.45	≈ 130	$-40\sim +150$
PTCL0625N60R0Y5	60	30	140 ± 10	$440V_{AC}$	625	≈ 2.3	≈ 155	$-40\sim +150$
PTCL0650N120RY5	120	30	140 ± 10	$460V_{AC}$	650	≈ 2.3	≈ 155	$-40\sim +150$
PTCL0850N250RY5	250	30	140 ± 10	$600V_{AC}$	850	≈ 2.3	≈ 155	$-40\sim +150$
PTCL1000N500RY5	500	30	140 ± 10	$700V_{AC}$	1000	≈ 2.3	≈ 155	$-40\sim +150$

[1], Testing voltage: 1.5VDC

[2], Curie Temperature: The resistance at TC is twice of R_{25}

Dimensions

Unit:mm

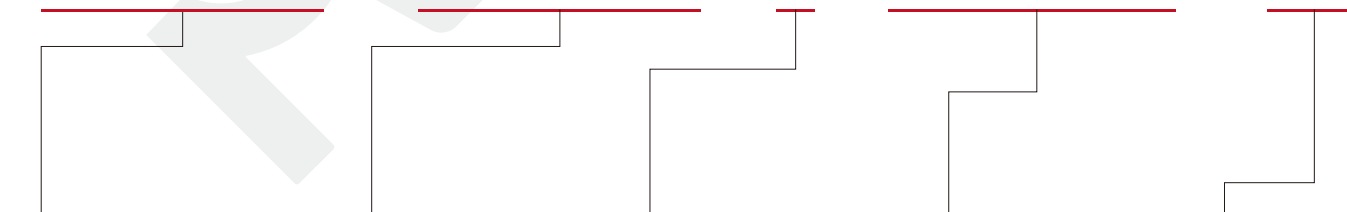


Size	W	L	H	D	a	t
PTCL0850N1K00Y5 PTCL0500N60R0Y5 PTCL0625N120RY5 PTCL0680N250RY5 PTCL0800N500RY5	14.0 Max	8.0 Max	17.0 Max	7.5±1.0	18.0 Min	0.8±0.1
PTCL0625N60R0Y5 PTCL0650N120RY5 PTCL0850N250RY5 PTCL1000N500RY5	17.0 Max	8.0 Max	21.0 Max	7.5±1.0	18.0 Min	0.8±0.1

Selection Table

Selection Example:PTCL0850N250RY5 (PTCL 850V_{DC} ±30% 250Ω Code)

P	T	C	L	0	8	5	0	N	2	5	0	R	Y	5
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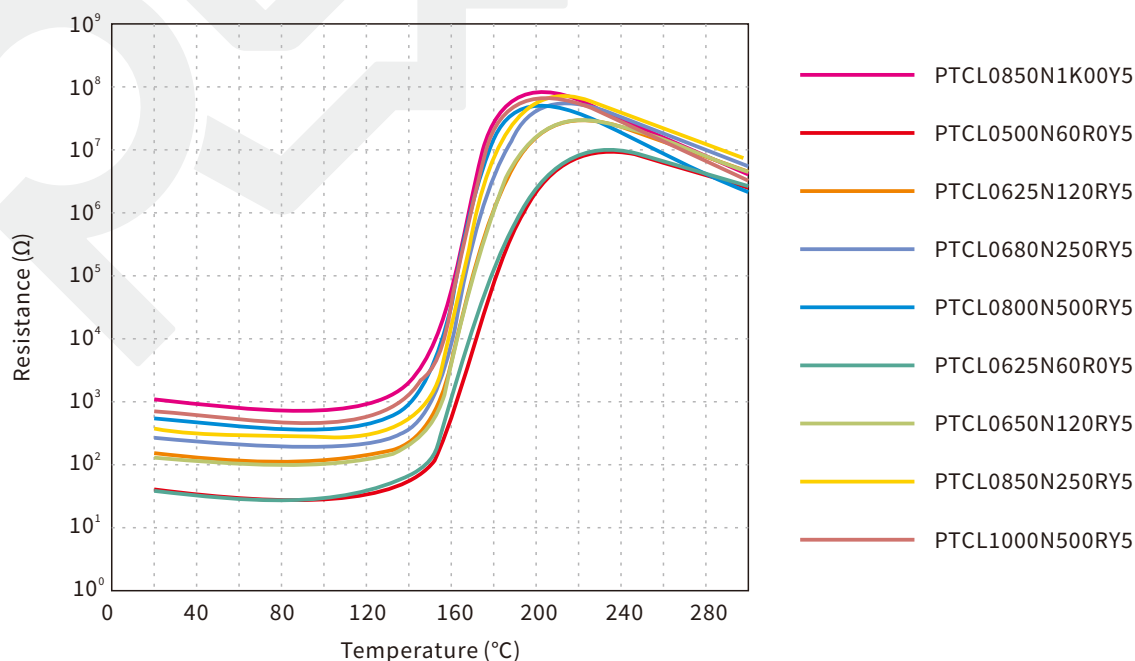


Series	Max. Link voltage	Tolerance	Resistance	Code
PTCL	0500=500V _{DC} 0625=625V _{DC} 0650=650V _{DC} 0680=680V _{DC} 0800=800V _{DC} 0850=850V _{DC} 1000=1000V _{DC}	N=±30%	60R=60Ω 120R=120Ω 250R=250Ω 500R=500Ω 1K00=1000Ω	Y5=Code

Performance

Test	Test Method	Typical
Strength of Terminal	4.9N applied the terminals, 10s	No damage
Terminal Bending strength	Posistor is held so that it is perpendicular to the lead wire with the force of 2.45N in the axial direction of the lead wire. The lead wire is slowly bent 90° and returned. Then it's slowly bent in the opposite direction and returned to original state.	No come off
Solder ability	Dip each lead into 230±5°C solder tub for 3±1second with the 5mm lead length remaining down from the bottom of the body of the sample. Check the surface covered with solder	Min.90% terminal is covered with solder.
Vibration Test	The change rate of vibration frequency shall be so selected that the frequency should increase from 10 to 55 Hz and return again to 10Hz for 1 minute with 3.0mm of vibration width. Such vibration cycle shall be repeated at X、Y and Z directions for each 1 hour	No visible damage; $\Delta R \leq 20\%$
Insulation Resistance	Under normal temperature and humidity conditions, connect the two electrodes of the product as the positive electrode, and wrap the envelope with aluminum foil as the negative electrode. There should be a gap of 2-2.5mm between the edge of the aluminum foil and the lead wire. Measure with a DC500V megger. Under normal temperature and humidity, the insulation resistance is more than 100M Ω .	>100M Ω
Electrical endurance, cycling	Room temperature, Maximum Voltage, applied energy $< C_{th} \times (T_{ref} - T_A)$, 1000cycles	$\Delta R \leq 25\%$
High temperature test	Storage at V_{max} , 105°C, 1000h	$\Delta R \leq 25\%$
Humidity State characteristics	40±2°C, 90~95%RH, 1000h	$\Delta R \leq 25\%$
Climatic sequence	+125°C 16h, -40°C 2h, 5cycles	$\Delta R \leq 25\%$

R-T CURVE



Attention

1. Do not apply abnormal voltage/current exceeding the specified maximum value. Because they may deteriorate or destroy PTC element
2. Use this product within the specified temperature. A higher temperature may deteriorate the characteristic or material
3. When this product is operated, temperature of some area may be over 100°C to 160°C. Please make sure that surrounding parts and inserting material can withstand the temperature. If the surrounding part and material is kept under such condition, they may be deteriorated or may produce harmful gas(Cl₂, H₂S, NH₃, SO_x, NO_x etc.). And, such harmful gas may deteriorate the element
4. The resin coating of this product is not for insulating purpose. Keep an adequate insulating distance to surrounding components
5. "This product does not have waterproof construction. A splashed water may cause failure mode such as decline of characteristic or current leak. So, Do NOT apply cleaning to immerse it into water or any solvent."
6. If you coat this product by resin, please evaluate the quality of this product before you use it. The stress of force which is caused by coating materials or heat cycles may cause failure mode such as deterioration of characteristic or current leak in worst case.
7. This product is using the solder of 220+/-5°C of melting points, in order to connect ceramics with a lead wire. Do not heat up a terminal area of this product over 180°C.
8. The ceramic element of this product is fragile, and care must be taken not to load an excessive press force or not to give a shock at handling. Such forces may cause cracking or chipping.
9. Do not apply an excessive force to the lead. Otherwise, it may cause break off the junction between lead and element, or may crack element. Therefore, hold of element side lead wire is recommended when lead wire is bent or cut.
10. When the lead of this product is soldered, pay attention as follows to avoid the decline of element characteristic or break down the element.
 - 10.1. Use Rosin type flux or non-activated flux(the content of chlorine shall be less than 0.2%)
 - 10.2. Do not dip the body into flux. (Flux shall be coated to lead wire only for soldering.)
 - 10.3. The pre-heat up should be conducted without melting the soldering of this product.
11. Do not apply tensile force or separating force to lead wire at soldering.
12. "Do not touch the resin case by soldering iron. The soldering point shall be min. 5 mm away from the root of lead wire. Please solder the following conditions.
 - Iron Tip Temperature : 360 degree C max.
 - Soldering Time : 4 seconds max. / 1 terminal
 - Number of Soldering : 1"
13. To keep solderability of product from declining, following storage condition is recommended.
 - 13.1. Storage condition Temperature : -10 to 40°C; Humidity : less than 75%RH (not dewing condition)
 - 13.2. Term : Please use this product within 6 months after shipment by first-in and first-out stocking system.
 - 13.3. Handling after unpacking of the minimum package: Reseal it promptly or store it seal open inside a sealed container with a drying agent
 - 13.4. Place: Do not store this product in corrosive gas(SO_x, Cl etc) or under sun-light.
14. Discarded treatment :
 - 14.1. Recycling
 - 14.2. Recovery processing by a professional electronic component recycling company
 - 14.3. Send back to our department

Revision

Version	Revised Content	Date	Approver
V0	Initial Issue	2026.2.4	ZQF

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