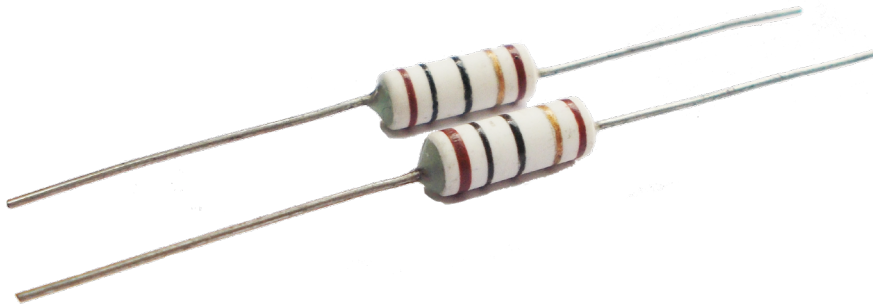


THE WORLD'S FIRST CUSTOMIZED ONE PIECE HYBRID COMPONENT

OVER TEMPERATURE PROTECTION



CRT Series

APPLICATION NOTE

Over Temperature Protector Resistor

INTRODUCTION

Security in electronic equipments and/or electronic parts is a very important concern nowadays. In traditional applications, the design engineers used a thermal fuse attached to inrush resistor body, in series connection, the inrush resistor for inrush current fusing under abnormal conditions coming from main source (typically) and the thermal fuse to fuse under high temperature to avoid overheating in the PCB, special in the resistor area.

The new CRT series is a fusible electronic component, which gives not only inrush current fuse characteristic but also thermal fuse characteristic, all combined in just one component.

CRT series is an hybrid electronic component. In just one piece/ component, Vitrohm offer an inrush current and a thermal fuse.

It's a compact component, easy to handle and to assembly in a PCB, saving assembling costs, and avoid using more than one component for above mentioned characteristics.

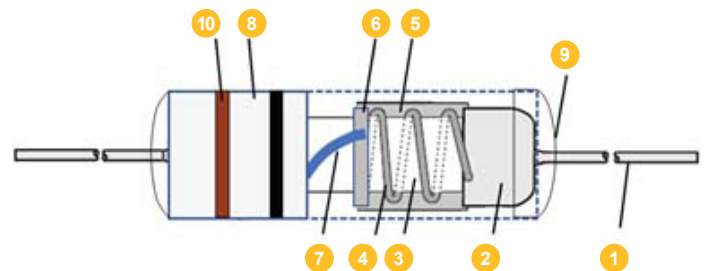


Fig. 1 - Detailed component construction

- | | |
|-------------------------------|---------------------|
| 1 Thermal wire | 6 Separator |
| 2 Tinned cap | 7 Thermal fuse wire |
| 3 Ceramic rod | 8 Ceramic case |
| 4 Resistive wire | 9 Sealing compound |
| 5 Silicone protecting coating | 10 Color code rings |

APPLICATIONS



Power Supplies



Battery Chargers



Home Appliances and Office Equipments



Alternative Energy

- Power inverters
- Solar energy



Industrial

- Electronic adaptors
- Industrial equipment
- Power tools
- Intelligent fuse boxes

FEATURES

One piece hybrid component

The world's first customized hybrid component in just one compact piece for thermal and inrush current fuse.

Over temperature protection

Over temperature protection for small overload current conditions.

Save PCB space

Save PCB space using just one compact component instead of two like other suppliers.

Customizable

Fusing current and fusing temperature can be customize according customer requirements.

Automated production

Automated production, with excellent productivity and quality.

Certification

UL recognition, RoHS compliance.

Withstand up to 2[KV] surge voltage

Withstand up to 2[KV] surge voltage, power supply board performance is not affected.

Fast acting fuse

Half short-circuited fast acting.

Wide ohmic value range
Excellent anti-surge protection
Assembling cost saving

APPLICATION NOTE



MAIN CHARACTERISTICS

Type	Power Rating P_{25} [W]	Ohmic value range	Pulse surge [kV]	Dimensions [mm]	
				Ø Diameter	Body length
CRT100	1,0	1R0 - 100R	Up to 2	4,0	11,0
CRT200	2,0	1R0 - 200R		4,8	12,0

Fusing protector marking	Fuse standard current [A]	Fusing temperature [°C]	Extra colour code ring
K	3	221	Black
-	2	221	Brown
L		187	Red
M	3	187	Orange

Beside standard characteristics, it is possible to develop a custom made component, in terms of maximum fuse temperature and maximum fuse voltage.

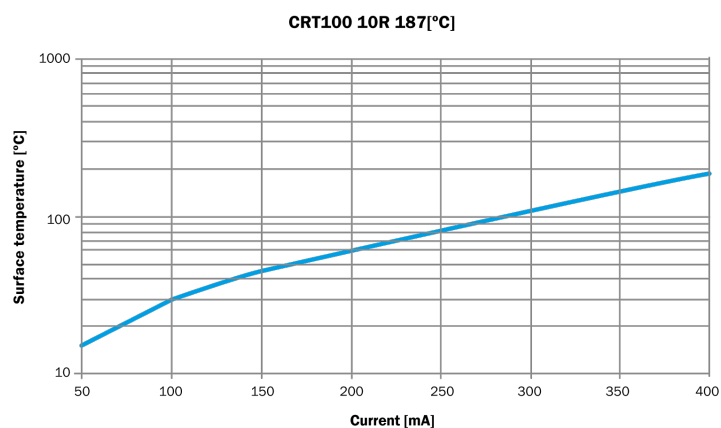


Fig. 2 - Surface temperature for CRT100 10R 187[°C]

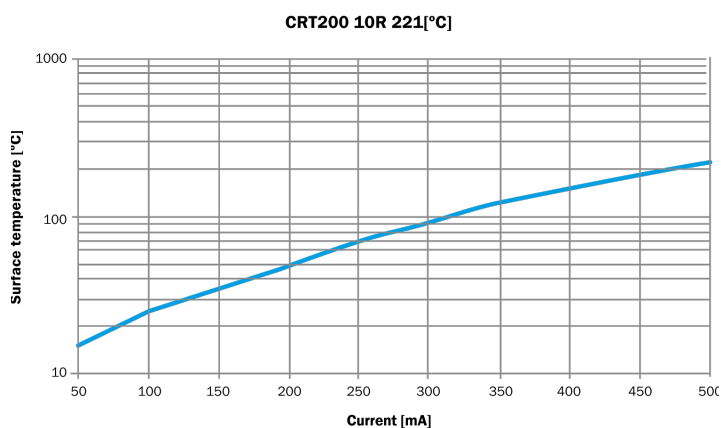


Fig. 3 - Surface temperature for CRT200 10R 221[°C]

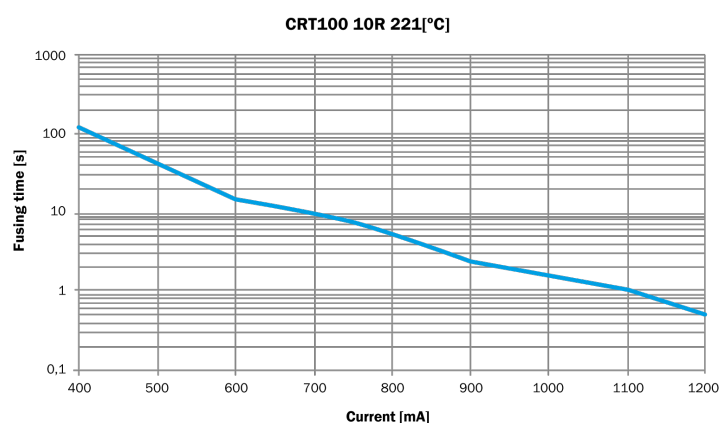
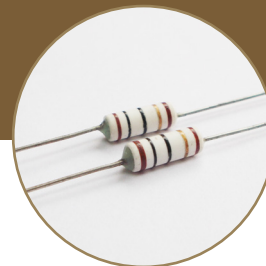

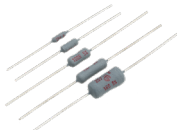
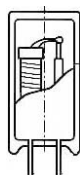



Fig. 4 - Fusing curve for CRT100 10R 221[°C]

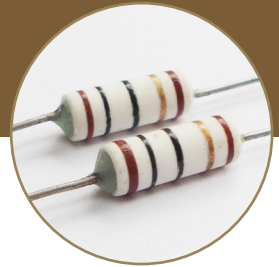
APPLICATION NOTE



TECHNOLOGY COMPARISON

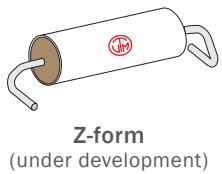
	TECHNOLOGY			
	Standalone Fusible	Fusible Resistor	Fusible Resistor + Thermal Fuse	Hybrid Compact Resistor
				
SERIES		CRF	RXF	CRT
FLAME OR EXPLOSION PROTECTION	Fairly	Excellent	Fairly	Excellent
INRUSH CURRENT PROTECTION	●	●	●	●
TEMPERATURE PROTECTION				●
TEMPERATURE + FUSIBLE PROTECTION				●
ADVANTAGES	<ul style="list-style-type: none"> ● Low-cost component 	<ul style="list-style-type: none"> ● UL qualified ● Inrush current fuse at 240[V] ● Works as resistor and inrush current fusible 	<ul style="list-style-type: none"> ● One component, two functions 	<ul style="list-style-type: none"> ● Hybrid resistor ● One component, two functions ● Compact resistor ● Lower price ● Easy to assembling ● Bending options available ● Custom made option available ● Lighter comparing with ceramic case ● Best option for new developments ● Best option for to replace ceramic case fusible resistor + thermal fusible
DISADVANTAGES	<ul style="list-style-type: none"> ● Only works as inrush current fuse 	<ul style="list-style-type: none"> ● Only works as inrush current fuse 	<ul style="list-style-type: none"> ● Cost ● Not compact size ● Standard characteristics 	

APPLICATION NOTE

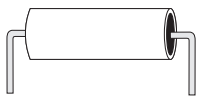


LEAD CONFIGURATIONS

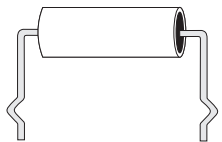
The CRT is also available in a different pre-forming, as shown below. Others available upon request.



Z-form
(under development)



Axial



Axial Kink



Radial



Radial Kink