

# HCRTP-mini-D

## Reflowable Thermal Protectors



### Description

High Current Reflowable Thermal Protection Mini (HCRTP-MINI-D) Device is low-resistance, robust surface mountable thermal protector for high voltage application. It has a set open temperature and can be installed using reliable, lead-free, Surface Mount Device (SMD) assembly and reflow processes.

The new HCRTP-MINI-D device, recently added to the RTP family, it's a high voltage version device with up rated voltage from 16V to 60V application, can help withstand the demanding environmental, life and reliability requirements of automotive and industrial applications with 48V or 60V rated voltage. In the field, the HCRTP-MINI-D device opens if its internal junction exceeds the device's specified open temperature. Temperature increases can have multiple sources, one of which is component failure (e.g., when using power components such as a powerFET, capacitor, resistor, triac, etc.) The HCRTP-MINI-D device open temperature is selected so that the device does not open within normal component operating windows, but it does open in a thermal runaway event and before the melt temperature of typical lead-free solders.

### Applications

- Hybrid and EV cars with high voltage with 48V or 60V application
- Automotive HVAC, ABS, power steering, DC/DC converters, diesel heaters, engine cooling fans, body control modules, PTC heaters, etc.
- IT servers, telecom power converters, etc.
- Other industrial applications with high demanding environmental, life and reliability requirements
- Other DC thermal protection

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### Features & Benefits

- Capable of high hold current
- Capable of high voltage to 48V and 60V application
- Low profile, compact footprint
- Low series resistance; DC interrupt voltage capable
- AEC-Q200 qualified
- Compatible with SMD solder reflow process up to 260°C
- Helps prevent failed components from causing damage in case of a thermal event
- Up to 48V and 60VDC product will be required by Hybrid and EV cars' customers to solve the potential thermal runaway issue during the electrification
- Allows the use of standard surface-mount production methods so that no special assembly costs are required
- Low power dissipation and voltage drop
- Supports DC electronic circuits
- Enables green design

### Additional Information



Resources



Samples

### Specifications

<b>Voltage Rating:</b>	500A @ 24 VDC, 300A @48V, 200A@60V
<b>Interrupting Rating:</b>	60 VDC
<b>Operating Temperature Range:</b>	-55°C to + 150°C
<b>Initial Resistance:</b>	50μΩ Min, 85μΩ Max

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## Reflowable Thermal Protectors

### Ordering Information

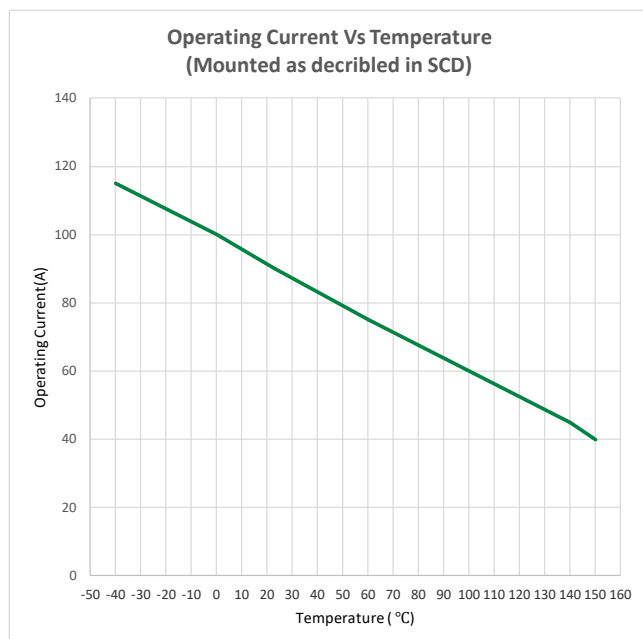
Part Number	Part Description	Package Size
RF5142-000	HCRTP-MINI-D	4000

### Referenced Performance

Results obtained on 44.4mm x 57.2 mm x1.6mm of 2-sided FR4 board T4485 with 4.0 oz. Copper Trace. HCRTP-mini-D device surface-mounted on test board T4485 using solder paste SAC 305 with recommended pad layout and solder stencil opening and thickness. Post reflow resistance based on SMT 1x reflow as outlined in solder reflow recommendation. Results are highly installation-dependent. Users should confirm for their own application.

Performance		Min	Typ.	Max	Units
<b>Post Reflow Resistance*</b>	@ 23+/-3°C	50	100	150	μΩ
	@ 150+/-3°C	110	155	200	
<b>Hold Current</b>	@ 23+/-3°C			90	A
	@ 140+/-3°C			45	
<b>Max Interrupt Current</b>	60 VDC			200A@60V 300A@48V 500A@24V	A
<b>Open Temperature</b>	Zero Bias	212	220	228	°C

\*Post reflow Resistance should be measured by a 4 wired method



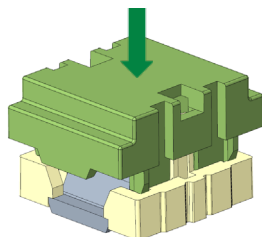
\* Halogen Free refers to: Br≤900ppm, Cl≤900ppm, Br+C≤1500ppm.

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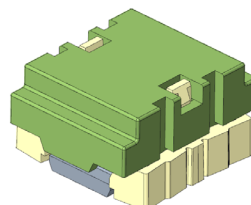
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### Arming method

Arming is to occur after surface mount installation. **Method:** Cap depressed manually or by mechanical plunger.



Downward force required for mechanical arming



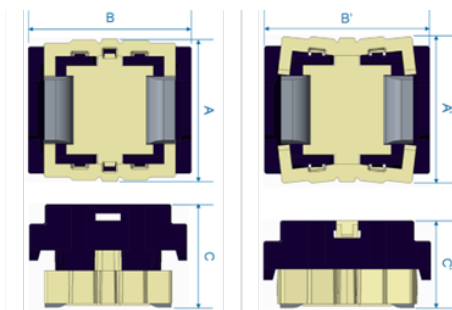
Device after mechanical arming completed

**Warning:** The device will not function without proper arming. If the device will be depressed by mechanical plunger, the plunger speed should be verified in the user's process.

Description	Min.	Typ.	Max.	Units
Arming Force (Normal to PCB surface)	35	40	45	N
Distance of travel	0.94	1.00	1.06	mm

### Dimensions

Dimensions in mm.



#### Before Mechanical Arming

	A		B		C	
	Min	Max	Min	Max	Min	Max
mm	6.14	7.14	7.00	8.00	4.80	5.20
in	0.242	0.281	0.276	0.315	0.189	0.205

#### After Mechanical Arming

	A'		B'		C'	
	Min	Max	Min	Max	Min	Max
mm	6.83	7.83	7.00	8.00	3.80	4.20
in	0.269	0.308	0.276	0.315	0.150	0.165

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