

# 11CT

## Small, Inrush-withstanding & Surface-mount Fuses

Despite its small size, the 11CT fuse series has inrush-withstanding characteristics and long-term reliability. It is a long-selling fuse recognized by circuit designers and engineers worldwide. This fuse is suitable for a variety of sectors, including the automotive sector, supported by excellent track record.

This application note describes the excellent features of 11CT and its main areas of application.

1. Specifications
2. Features
3. Construction
4. Applications



SOC Group: SOC Corporation  
SOC America Inc.  
SOC Asia Pte. Ltd.  
SOC Europe B.V.

## Specifications

(1) Rated voltage	DC72V
(2) Rated current	100mA – 10A
(3) Rated breaking capacity	50A
(4) Certifications	UL Recognized: UL248-1, UL248-14 CSA Certified: CSA C22.2 No. 248.1, CSA C22.2 No.248.14

## Features

### 1. Excellent breaking performance

The miniaturization of circuit boards along with the down-sizing of equipment is an ongoing trend, while battery performance continues to improve. Therefore, the risk of accidental over-current leading to smoke or fire is increasing. Thanks to the innovative design of the inner structure despite its small size, 11CT is capable of interrupting the over-current up to 50 A at DC72V.

\* We also have a DC86V11CT series operable at DC86V. Please contact our sales offices for any enquiries.

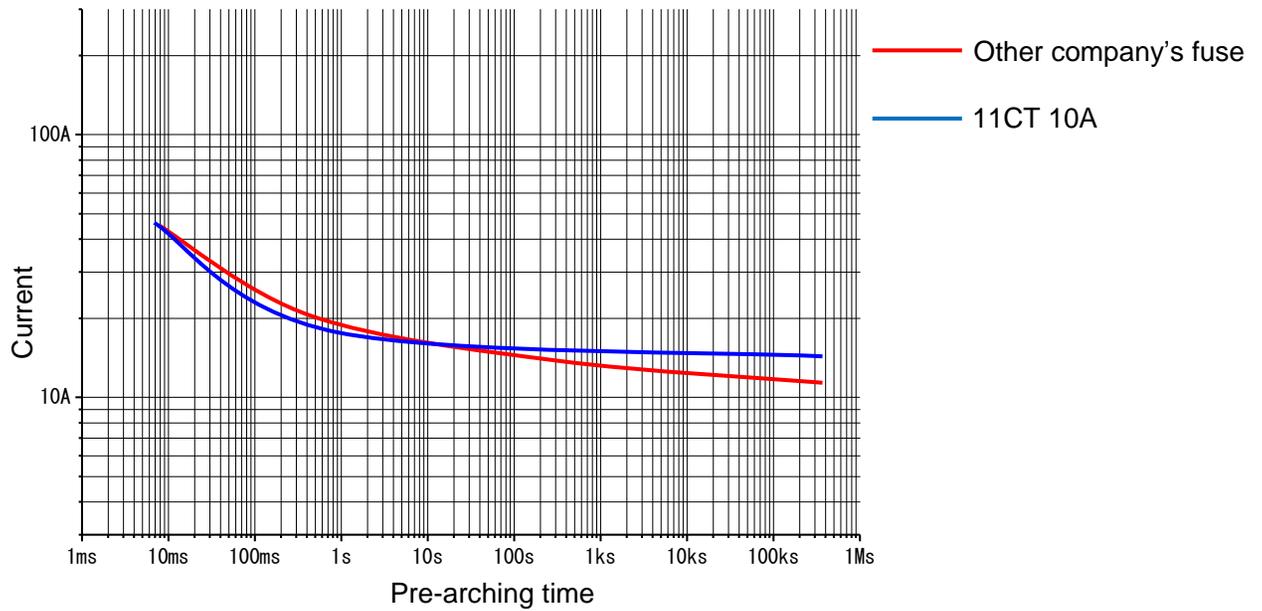
### 2. Inrush-withstanding capability to backup switching devices

In an electronic circuit, switching devices such as FET control the flow of current. If a switching device malfunctions, wires and critical components such as IC could be damaged due to the relatively large current lasting for a prolonged time. Therefore, as a backup to the failure of switching devices, fuses should have inrush-withstanding capability. A conventional method of giving inrush-withstanding capability has been to use low-melting-point alloy. However, in this case, the depletion of durability for prolonged use was a major challenge.

As explained in the I-t curves (below), the drop of current in the area of longer pre-arching time shows the decline of current for a prolonged period. SOC's specific structure of fuse element made both inrush-withstanding capability and long-term reliability possible, which are critical to backup switching devices.

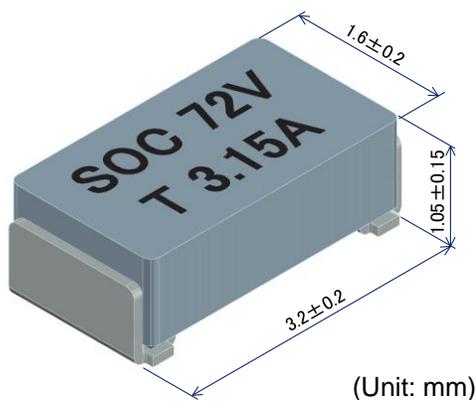
\*We also have an 11CF series with quick-acting capability. Please contact our sales offices for any enquiries.

I-t curves (example)

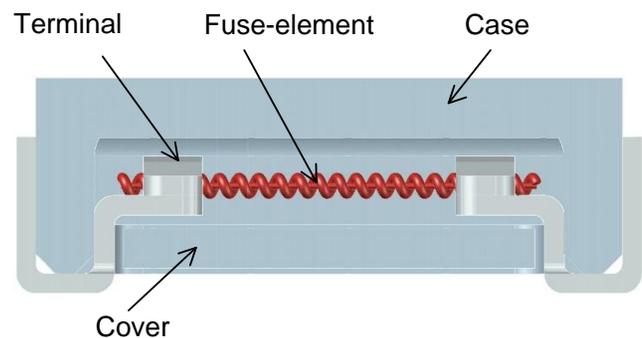


## Construction

Appearance and dimensions



Interior



1. A space is secured inside of the fuse where the element is suspended in the air between the terminals.
2. This unique configuration can restrict the dispersion of Joule heat from the fuse-element and the influence of heat conduction to the minimum, since the fuse-element does not contact anything except the air and the terminals.
3. In other words, Joule heat can be spent to melt the fuse-element during overload conditions, and the fuse can operate with less Joule heat. Accordingly, the following can be achieved: (a) a stable pre-arching time/current characteristics, (b) lower voltage drop in overcurrent conditions, and (c) proper operation at relatively low voltage.  
\* As the performance of the fuse may vary depending on the characteristic of the circuit, please test it using the actual equipment before its application.
4. The high performance is achieved by the designing of secured inner space which effectively alleviates the interior pressure increase caused by the vaporization of the element material.
5. The element is joined to the terminals by welding which can tolerate higher temperatures than soldering, so that the fuse is not affected by the heat when soldering the fuse on the circuit board.
6. The body, made up of a ceramic case and a cover, realizes high insulation performance after the breaking of current.
7. A stable inrush-withstanding capability is achieved by the helically wound element along the wire element.

## Applications

1. The protection of batteries for portable equipment
  - The protection coordination with switching devices
2. The protection of automotive equipment
  - Monitoring circuit for high voltage batteries
  - Automotive monitor and USB charger module
3. The circuit protection of a variety of equipment
  - Semiconductor manufacturing equipment
  - Measuring equipment
  - Video display for airplanes