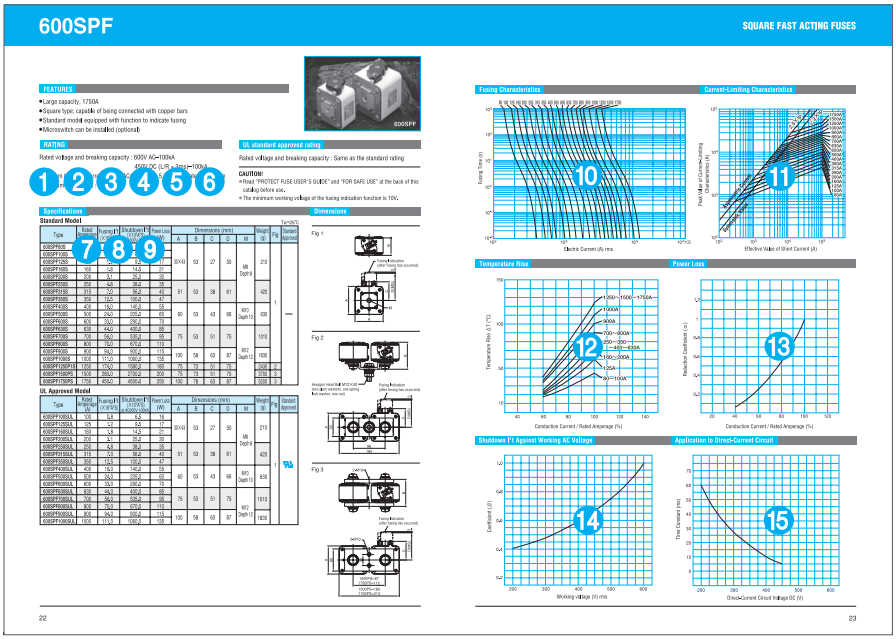

Product name example

350GH-125SUL

- UL: UL-approved product
- TC: CCC-approved product
- S: Fuse with indicator
- None: Fuse without indicator
- Rated amperage
- Series name: 2 letters plus "-" (hyphen) or 3 letters
- Rated voltage

❶ DC rated voltage

The fuse can be used in a direct-current circuit with voltage under this value.

❷ Time constant (L/R)

The fuse for the circuit over this value of the closed path time constant, which is assumed when a short circuit occurs. (Refer to the chart titled "Application to direct-current circuit" for details.)

* Under some conditions, the fuse may not be used even at a value lower than this.

❸ Current-breaking capacity

The fuse can block off a short-circuit current up to this value.

❹ AC rated voltage

The fuse can be used at an AC rated voltage under this value.

❺ Minimum breaking current

The fuse may not be able to block off when it fuses at a value lower than this overcurrent (refer to the fusing characteristics chart); therefore, it is necessary to block off using the current-limiting function of chips. If you choose a fuse with sufficient margin in rated voltage, the minimum breaking current can be reduced.

❻ Maximum arc voltaget

Depending on the situation, there might be a difference of electric potential between both terminals up to this value at the moment of fusing. It is important to pay attention to the arrangement of the peripheral parts.

❼ Rated amperage

The rated amperage value is prescribed in JEM1383. Derating is necessary for normal current. (Refer to PROTECT FUSE USER' S GUIDE.)

❽ Fusing I^2t

The Joule-integral value against the fusing time (refer to Q&A section below). This value is used in case of overcurrent, which is rather short (approximately 1ms or less) and large (tens of times the rated amperage). It is possible to determine the fusing time and fusing current from this value.

❾ Shutdown I^2t

The Joule-integral value against the shutdown time (refer to Q&A section below). This value is used to consider the protection performance in case of overcurrent, which is rather short (approximately 1ms or less) and rather large (tens of times the rated amperage). This value needs to be smaller than the permissible I^2t of the chip for perfect protection of a semiconductor.

❿ Fusing characteristics chart

This chart shows the time (in seconds) the fuse takes for fusing the overcurrent at each level of amperage. This chart shows an average value. This value is used in case of an overcurrent that is long (10ms or more) and small (from several times to tens of times the rated amperage).

Because the arc time is short enough compared to the fusing time for electric current in this area, the fusing time can be regarded as the same as the block-off time.

⓫ Current-limiting characteristics chart

When a short circuit occurs, the peak value of the short-circuit current will be from $\sqrt{2} \times Ip$ to $2.5 \times Ip$ (Ip: effective value of the short-circuit current) for alternating current, but the fuse will restrain the current before reaching this value. This chart shows the peak value of the restrained current. When protecting a semiconductor such as a thyristor completely, it is necessary to choose a fuse with a smaller value than the surge on-state current rating of the chip.

⓬ Temperature-rise chart

The temperature-rise value around the center of the fuse in the test environment prescribed in JEM1383. (Only for board-soldered-type fuses, refer to each product page for testing conditions.)

⓭ Power loss chart

When a working current is below the rated amperage, use both this chart and the specification table to obtain a power loss value.

[Power loss = power loss at the time of rated amperage (refer to the specification table) × coefficient α (refer to this chart)]

⓮ Shutdown I^2t against the working voltage chart

This chart shows that the block-off time can be reduced (the shutdown I^2t can be smaller) by using the voltage that has sufficient margin against the rated voltage of the fuse.

[The shutdown I^2t at the working voltage = the shutdown I^2t (refer to the specification table) × coefficient β]

⓯ Application to direct-current circuit chart

When using the fuse for a direct-current circuit, you must be aware that if the time constant (L/R) on the assumed limiting short-circuit current exceeds the value on this chart, the fuse cannot block off properly.

Q. What is the difference between fusing and blocking off?

A. When an overcurrent flows, the soluble form in the fuse is dissolved by Joule heat (this process is called "fusing"). However, at the moment of fusing, arc discharge occurs around the cut-off area and it remains electrically connected. The electrically disconnected state seen when this discharge ends is called "blocked off" or "shutdown." For our products, values regarding fusing are used mainly to consider the life expectancy, and values regarding blocking off are mainly used to consider the protection performance.