HINODE
PROTECT FUSE

Product Catalog

Catalog'23-04E

Today's power devices are generally equipped with various security features, and their safety has improved greatly.

However, extraordinary, unexpected "accidents" do happen from time to time.

All means of protection adopted on design may become futile in cases such as:

- Errors in assembly work
- Contamination with a foreign substance
- Damage to semiconductors by disturbances such as heat or shock

Before such accidents affect other chips or equipment, HINODE PROTECT FUSE will safely block off equipment as the last line of protection.

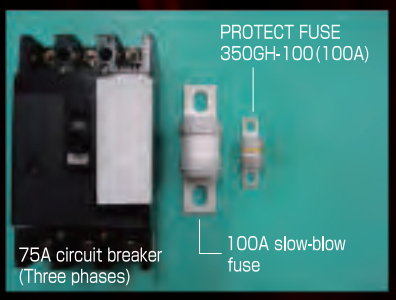
What is the HINODE PROTECT FUSE?

HINODE PROTECT FUSE is a fast-acting fuse that blocks off equipment in a few microseconds even in cases of short-circuit accidents that ordinary fuses (slow-blow fuses) and circuit breakers cannot protect against.

FEATURES OF HINODE PROTECT FUSE

- Safe and reliable: Fast-acting fuse that can block off even direct-current
- Small and compact: Compared with a slow-blow fuse and a circuit breaker (see photo)
- Applicable to high voltage: Up to 1500V*
- Large capacity: Current blocking capacity of up to 100kA*

* Specifications vary depending on the product; refer to the specifications of each product for details.



Applications of HINODE PROTECT FUSE

HINODE PROTECT FUSE is widely used for general power electric products (approximately 1kW), including:

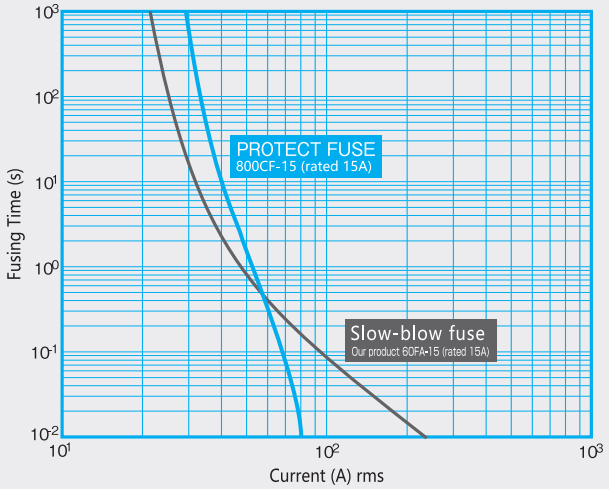
- Inverter motor drivers
- Servo drivers
- Direct-Current power sources
- Alternating-Current variable power sources
- Uninterruptible power supplies (UPSs)
- Energy Strage System (home and industrial)

Q : Is HINODE PROTECT FUSE easy to break if it is so quick to cut off?

A : No, it's not. Conversely, around the rated amperage, our fuse is less likely to break than a slow-blow fuse (refer to chart below).

Comparison between PROTECT FUSE and a slow-blow fuse

Curve of Fusing Time vs. Current



PURPOSE AND APPLICATIONS

When a short circuit occurs, an overcurrent*1 greatly exceeding the rated amperage flows in a circuit. This causes abnormal heat generation on the wiring pattern and parts and may lead to an accident such as ignition, fumes, or explosion. When a short-circuit current damages a component, it is generally not easy to locate, so restoration of functionality tends to take a long time. Our fuses will help minimize such accidents and, in the case of an accident, will help you work efficiently for restoring the functionality*2. The following are applications of our fuses:

Protecting semiconductors (diodes, thyristors, etc.)

- Purpose : To protect semiconductors from the overcurrent when a load circuit shorts out or to prevent secondary damage when a semiconductor itself is broken down.*3
- Applications : Thyristor stacks, electric power regulators, electric furnaces (equipment with heater controls by SSR, etc.), DC stabilized power supplies, and, generally, modules with a power device.

Protection from a short circuit caused by deterioration of components

- Purpose : To prevent secondary damage from an internal short circuit caused by a decrease of insulation resistance that is the result of deterioration of a condenser.
- Applications : Capacitors and circuits using smoothing condensers (such as power supply circuits).

Protection from a short-circuit mode (arm short circuit) in an inverter circuit

- Purpose : To prevent secondary damage of an arm short circuit caused by destruction of a transistor or a diode, a breakdown of a control circuit and/or a drive circuit, or a malfunction by noise.
- Applications : Bridge circuits in equipment (motor drives, air conditioners, UPSs, etc.) with an insulated gate bipolar transistor (IGBT) or other related semiconductors.

Protection from any other short circuits such as output short circuits, earth short circuits, and battery short circuits

- Purpose : To prevent secondary damage of an output short circuit or an earth short circuit caused by miswiring, an insulation defect of a load, etc. To protect between devices or between units. To prevent secondary damage caused by a two-polar-plate short circuit of a battery.
- Applications: All industrial equipment such as battery-powered machinery (forklifts, golf carts, UPSs, etc.), control boards, instruments to manufacture semiconductors, and so on.

*1 Short current depends on the capacity of the circuit, but it could be a large current above a few thousand amperes. Most of our products have a current-blocking capacity of over 10kA at the maximum and are able safely to block off such current.

*2 Because of cut-off by a fuse, it is easy to locate the troubled circuit and also to minimize damage to other devices.

*3 The breakdown of semiconductors is caused by diode destruction, gate destruction, temperature destruction, avalanche destruction, oscillation destruction, and so on.

CONTENTS

*4 It does not mean that the standard approved applies to every rated voltage. Refer to the product information page of each fuse for details.

*5 Not conforming to Chinese RoHS.

*6 250SF : 250SFK :

The information for products not listed in this catalog can be found on our website.

* If you would use fuses in this situation that the short-circuit current di / dt = 50 [A / μs] or more, please contact us.

QUESTIONS AND ANSWERS

I'd like to know which fuse to use.

Refer to page 50 of PROTECT FUSE USER'S GUIDE.
Fuses need to have two opposing functions: blocking performance (the lower the rated amperage against conduction current, the better) and durability (the higher the rated amperage against conduction current, the better). Select a fuse that strikes a good balance between those two according to your needs.

What should I do when all fuses seem to be unsuitable?

Do not hesitate to contact our office. The data of each fuse and the guidelines on how to choose them listed in this catalog have margins for simplification. We are ready to provide you with more detailed information. Also, if you could provide us with details of your situation, we would be delighted to help you determine the best product for your needs.

I'd like to know the withstand voltage performance.

Refer to each rated voltage shown on the product pages. Select a fuse with a larger rated frequency than the circuit voltage (for DC, voltage after rectification) on the short circuit expected in case of an accident. Take the following points into consideration:

- Keep in mind that rated voltage of a fuse differs between AC and DC.
- For DC, available voltage changes according to the time constant (L/R) on the short circuit. Refer to the chart titled "Application to direct-current circuit" on each product page.
- Depending on the standard observed (UL standard, CCC standard, etc.), the rated voltage may change. Be aware that the fuse may not be regarded as an approved fuse when used in a circuit exceeding the rated voltage.
- Block-off can be achieved with a fuse that you select by following the above instructions. However, adopting a fuse with more voltage as leeway will enable you to;
  - Cope with voltage fluctuation.
  - Shorten the block-off time (mentioned below).
  - Decrease the minimum block-off current.

I' d like to know the blocking performance.

- I'd like to know if the fuse can block off before the object under protection is damaged.

a) If overcurrent time is approximately over 10ms

(A) Refer to the fusing characteristics curve. If the current (A) vs. time (s) curve of the fracture characteristics of the target object is positioned to the right of the fusing characteristics curve of the product, it means the fuse can block off before the object is damaged.

b) If overcurrent time is approximately under 1ms

(A) Compensate the shutdown I^2t value of each fuse using "shutdown I^2t against the working voltage" chart.

(B) If the permissible I^2t value for the target object is available, compare the shutdown I^2t with it, and if the shutdown I2t is smaller than the permissible I^2t value, it means the fuse can block off before the object is damaged.

(C) If only the damaging current vs. time curve of the target object is available, calculate its permissible I^2t value [= (damaging current)^2 × time] and compare in the same way as in (B).

For the area of (A), it appears to be protected by other protection equipment and/or current-limiting functions, and our fuses are often selected emphasizing protecting the area of (B). Also, even in cases that the shutdown I^2t is larger than permissible I^2t, our fuses are often used to prevent explosions, ignitions, and secondary damage.

- I'd like to know the current value that the fuse cannot block off.
  - Refer to the blocking capacity of each fuse. Electric current exceeding the value cannot be blocked off.
  - Refer to the minimum block-off current of each fuse. Electric current below this value cannot be blocked off. Despite fusing, block-off may not take place, possibly causing an accident. Therefore, take the following measures:
    - ◆Using the current control function of the circuits of other protection devices, ensure that current does not flow in that area.
    - ◆Use a fuse with a rated voltage above the circuit voltage to reduce the minimum block-off current.

I'd like to know the electric durability performance.

- I'd like to know the maximum magnitude (amperes) and the maximum rate of increase of overcurrent that a fuse can endure.
  - Read the value from the fusing characteristics curve of each fuse.
  - When an electric current larger than current range of a fusing characteristics curve flows, the value is calculated from the fusing I^2t value of each fuse.
    [Fusing time = fusing I^2t value ÷ (short-circuit current value) ^{2}]
    (The fusing time and electric current are effective for overcurrent only once. Once such an overcurrent flows, the fuse becomes easy to cut off. For more details, refer to the material about life expectancy).
- I'd like to know the life expectancy of the fuse against constant electric current and repetitive overcurrent.
  →Refer to separate materials for details.

I'd like to know an environmental resistance performance.

- Heat generation: Refer to the temperature characteristics chart of each fuse.
- Temperature characteristics: Refer to the chart titled "Compensation by ambient temperature."
- Other details on environmental résistance: Contact us for more information.
  (Additional environmental testing may be required for in-vehicle fuses.)

I'd like to purchase a PROTECT FUSE.

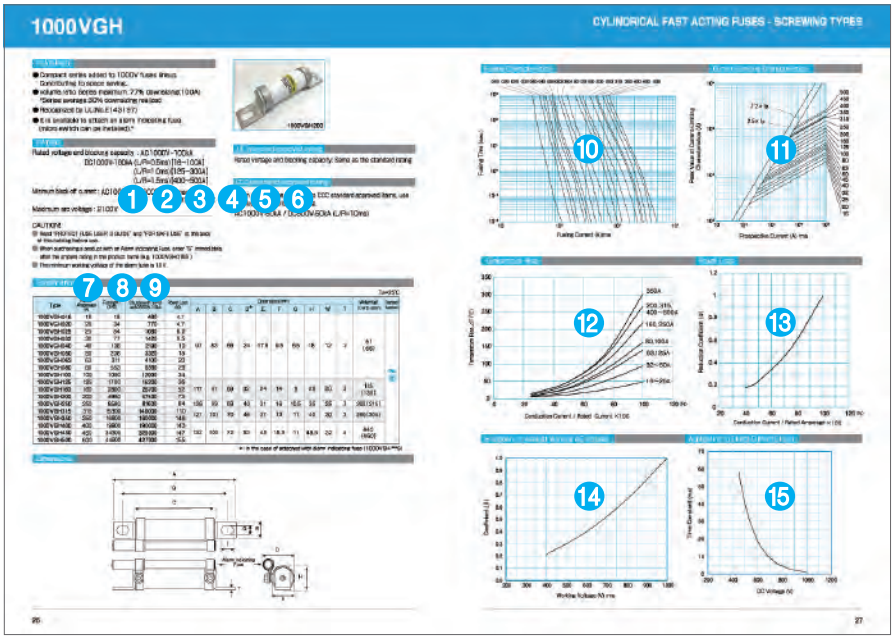
Consult your agent or our company directly any time. If you already know which fuse to purchase, request an estimate using the request form at the back of this catalog.You can also ask for an estimate from our website (http://www.hinodedenki.co.jp/).

I'd like to ask for analysis of a cut-off fuse.

Consult your agent or our company any time.

*Characteristics of each fuse (fusing characteristics, I^2t value, etc.) indicated in this catalog are average values and may change according to its condition of use, its environmental condition, individual variability, and so on. Use sufficient margin when making a selection.

HOW TO USE THIS CATALOG



Product name example: 350GH-125S

- S: Fuse with alarm indicate
- None: Fuse without alarm indicate
- 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-blocking 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 block-off 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 block-off 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 JIS C 8337–2021. 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 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 JIS C 8337–2021. (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.

250SF/250SFK, 500SF/500SFK

FEATURES

●It is realized current blocking capacity of 10kA at 500V which size is as same as a glass tube fuses of ϕ6㎜
●Space saving can be realized.

RATING

●250SF/SFK

Rated voltage and blocking capacity : 250V AC-10kA, 250V DC (L/R = 10ms)-10kA
Minimum block-off current : 250V AC/DC- 4 times the rated amperage
Maximum arc voltage: 500V

●500SF/SFK

Rated voltage and blocking capacity : 500V AC-10kA, 500V DC (L/R = 2ms)-10kA
Minimum block-off current : 500V AC/DC- 4 times the rated amperage
Maximum arc voltage : 1000V

UL/cUL standard approved rating

Rated voltage and blocking capacity: Same as the standard rating.
(250SF is not cUL approved)

250SF/500SF

250SFK/500SFK

CCC standard approved rating

When applying the standard to UL standard approved items, use the fuse in the following rating.

Rated voltage and breaking capacity : 500V AC-50kA, 500V DC (L/R = 10ms)-50kA
(250SF/SFK are not CCC approved.)

CAUTION!

- Read "FOR SAFE USE" and "PROTECT FUSE USER' S GUIDE" at the back of this catalog before use.
- A small fuse may generate a relatively large amount of heat, so a fuse with sufficient capacity is recommended for long, continuous use.

Specifications 250SF/250SFK

Ta=25℃

Type	Rated Amperage (A)	Fusing I²t (A²S)	Shutdown I²t (A²S) at AC250V 10KA	Power Loss (W)	Weight (g)	Fig	Standard	Option
250SF-10	10	25	80	1.6	SF= 2.5	SF= Fig 1	SF=	Holder HK0631
250SFK10				1.7			SFK=	Cover HC06
250SF-16	16	55	170	3.2				Clip C-06SF *1 *2
250SFK16				3.5	SFK= 3.25	SFK= Fig 2		
250SF-25	25	220	650	5.0			-	
250SFK25				5.0				

*1 It is not fit for series SFK.
*2 Continuous energizing current:15A

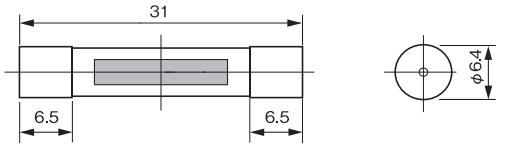
Specifications 500SF/500SFK

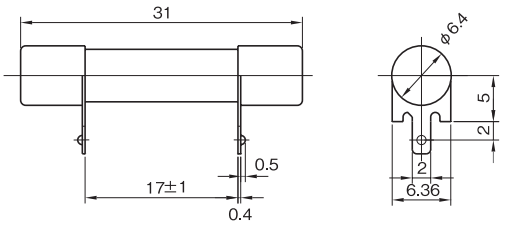
Ta=25℃

Type	Rated Amperage (A)	Fusing I2t (A2S)	Shutdown I2t (A2S) at AC500V 10KA	Power Loss (W)	Weight (g)	Fig	Standard	Option
500SF-10	10	25	80	1.6	SF= 2.5	SF= Fig 1	SF=	Holder HK0631
500SFK10				1.7				Cover HC06
500SF-16	16	55	170	3.2			SFK=	Clip C-06SF *1 *2
500SFK16				3.5	SFK= 3.25	SFK= Fig 2		
500SF-20	20	150	520	5.0				
500SFK20				5.0				

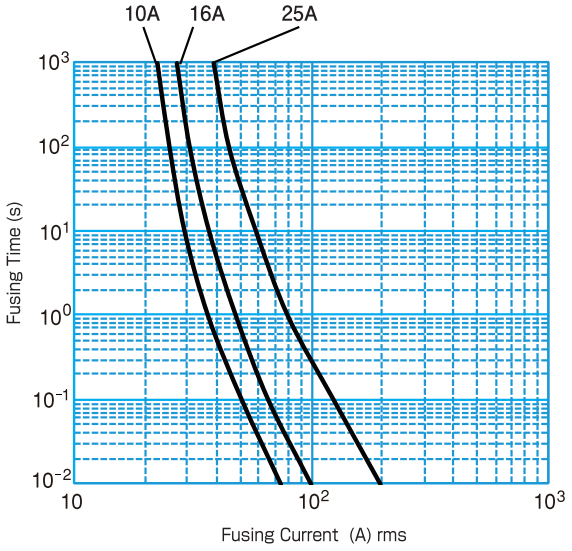
*1 It is not fit for series SFK.
*2 Continuous energizing current:15A

Dimensions 250SF, 500SF ⟨Fig.1⟩ 250SFK, 500SFK ⟨Fig.2⟩

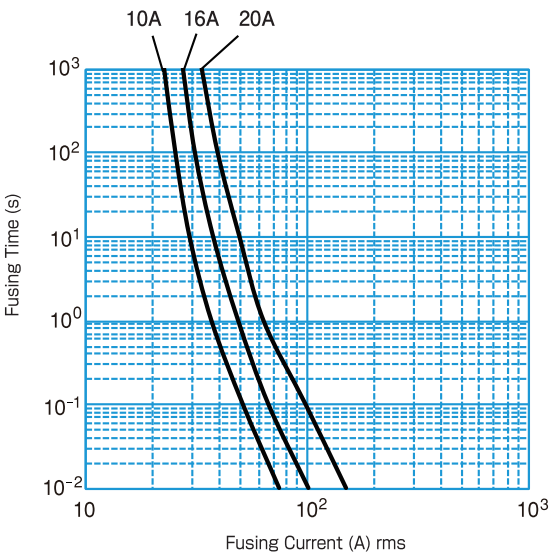




Fusing Characteristics 250SF/250SFK

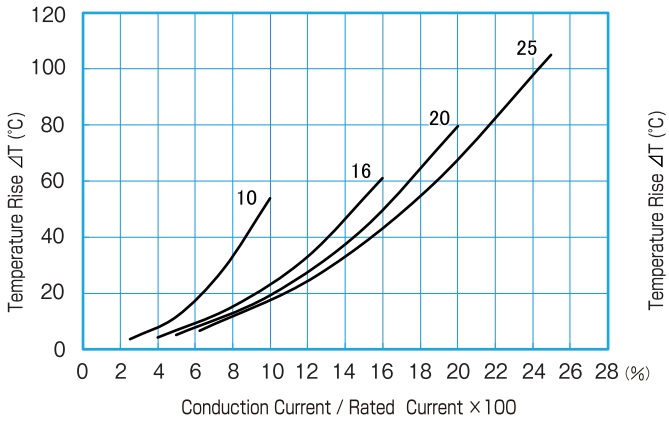


Fusing Characteristics 500SF/500SFK

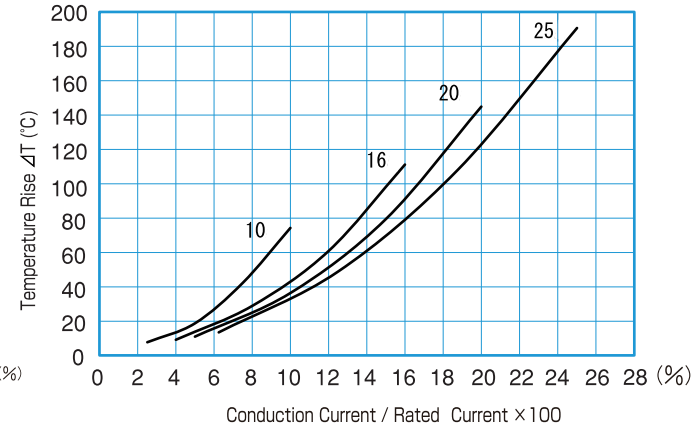


Temperature Rise

250SF/500SF

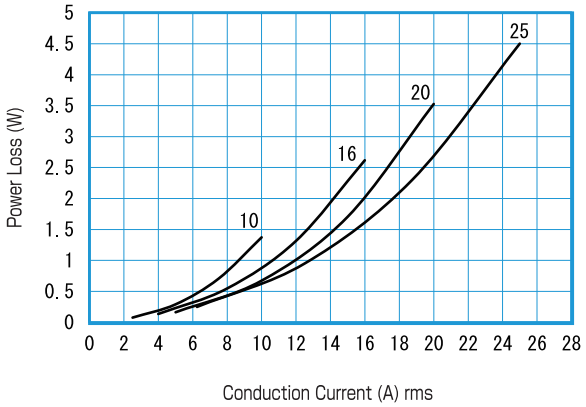


250SFK/500SFK

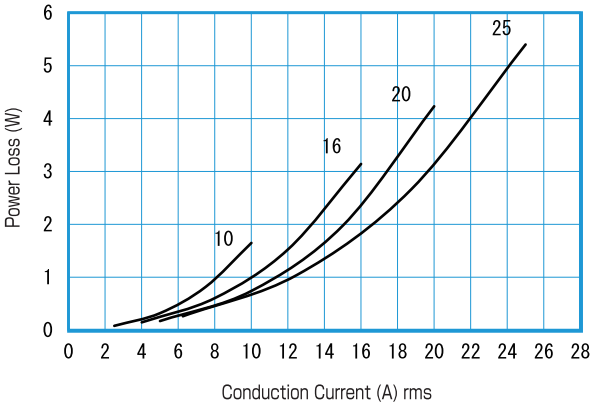


Power Loss

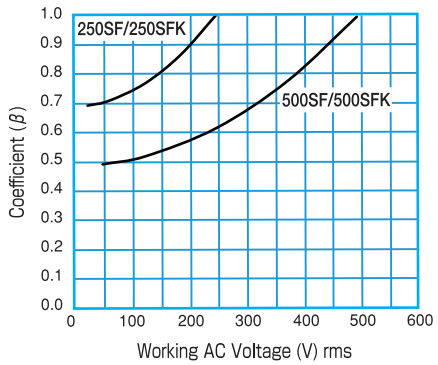
250SF/500SF



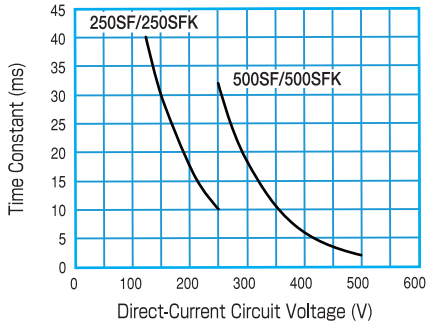
250SFK/500SFK



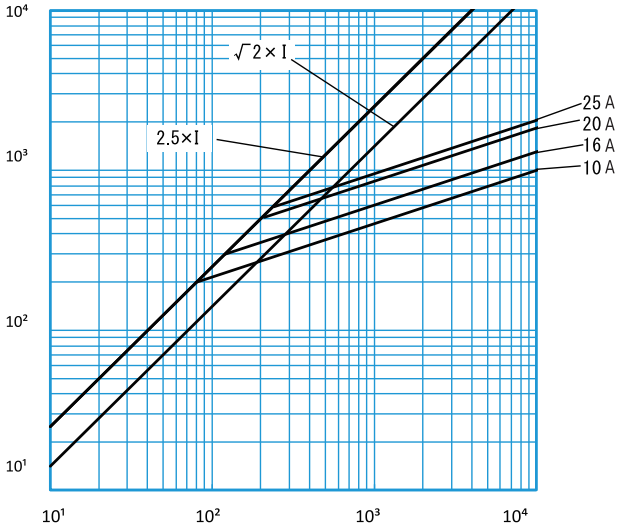
Shutdown I²t Against Working AC Voltage



Application to Direct-Current Circuit



Current-Limiting Characteristics



Power Loss and Temperature Characteristics

●Testing Conditions for Board-Soldered-Type Fuses

The power loss and the temperature characteristics are studied using an FR-4 board (one-side board) and a 35-μm-thick copper foil with a copper foil width of 0.5 mm/A depending on the rated amperage (e.g. 5 mm width for a product rated at 10A).

400KH/400KHK

FEATURES

- The full length is 26 mm (KHK), which is convenient to arrange on the board.
- Being extremely compact, it is compliant to 400V-60A class.
- Most suitable for small inverters, servos, UPSs, power supplies, etc.
- Two types are available for choice according to the installation method.

RATING

●Rating 5-30A

Rated voltage and blocking capacity : 400V AC - 10kA, 400V DC (L/R = 5ms)-10kA
Minimum block-off current : 400V AC/DC - 4 times the rated amperage
Maximum arc voltage : 800V

●Rating 35-60A

Rated voltage and blocking capacity : 400V AC-10kA, 400V DC (L/R = 2ms)-10kA
Minimum block-off current : 400V AC - 5.3 times the rated amperage
400V DC - 20 times the rated amperage
360V DC - 8 times the rated amperage
Maximum arc voltage : 800V

UL standard approved rating

When applying the standard to UL standard approved items, use the fuse in the following rating.

●Rating 5-30A

Rated voltage and blocking capacity : Same as the standard rating

●Rating 35-60A

Rated voltage and blocking capacity : 400V AC-10kA
360V DC (L/R = 2ms)-10kA

CCC standard approved rating

When applying the standard to UL standard approved items, use the fuse in the following rating.

Rated voltage and breaking capacity : 400V AC-50kA, 260V DC (L/R = 10ms)-50kA

CAUTION!

- Read "FOR SAFE USE" and "PROTECT FUSE USER' S GUIDE" at the back of this catalog before use.
- A small fuse may generate a relatively large amount of heat, so a fuse with sufficient capacity is recommended for long, continuous use.
- Fusing indication function is not provided.
- Series 400KHK; Use it at 50% or less of the rated current.

Specifications

Ta=25℃

Type	Rated Amperage (A)	Fusing I²t (A²S)	Shutdown I2t (A2S) at AC400V 10KA	Power Loss (W)	Weight (g)	Fig	Standard Approved
400KH-5	5	2	30	0.5	KH= 10.5 KHK= 8.5	KH= Fig 1 KHK= Fig 2	c UL us CCC
400KHK05				0.5			
400KH-10	10	6	90	1.0			
400KHK10				1.1			
400KH-15	15	12	180	1.6			
400KHK15				1.7			
400KH-20	20	25	290	2.3			
400KHK20				2.9			
400KH-25	25	43	620	2.8			
400KHK25				2.9			
400KH-30	30	67	920	2.8			
400KHK30				3.9			
400KH-35	35	99	1280	2.8			
400KHK35				5.2			
400KH-40	40	177	2030	3.3			
400KHK40				5.2			
400KH-50	50	264	2700	4.5			
400KHK50				6.9			
400KH-60	60	314	3080	5.4			
400KHK60				7.1			

Dimensions

Fig 1
400KH

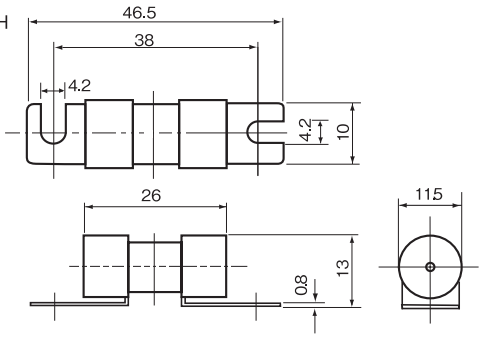
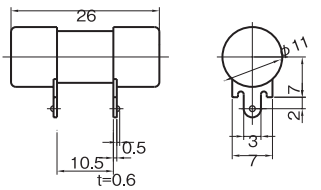
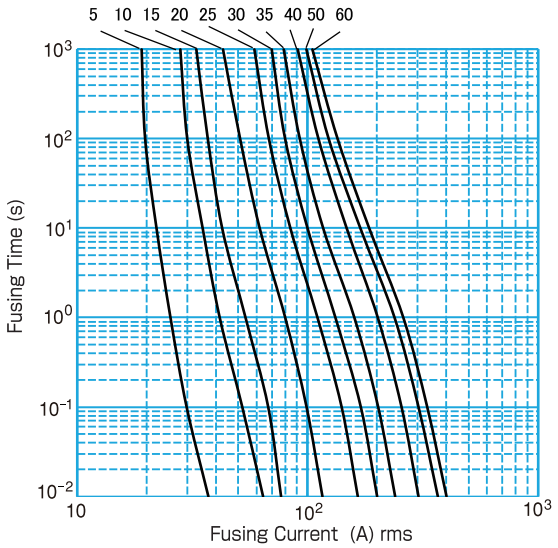


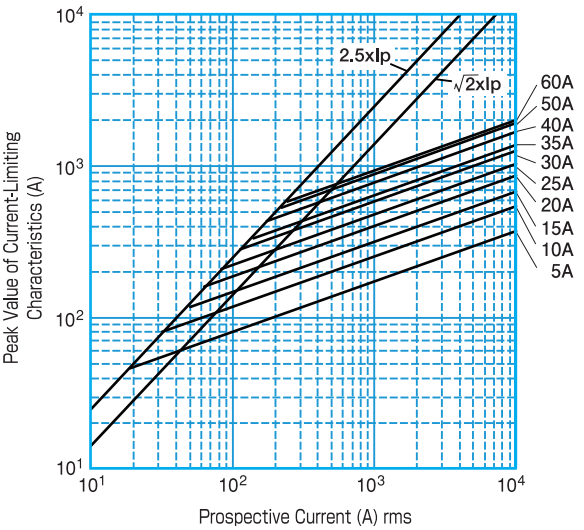
Fig 2
400KHK



Fusing Characteristics

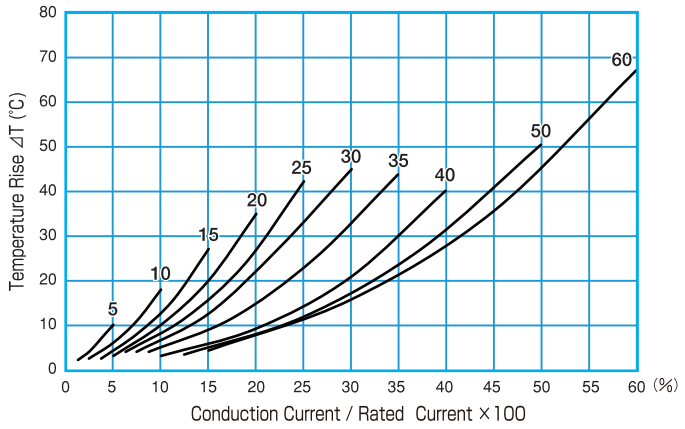


Current-Limiting Characteristics

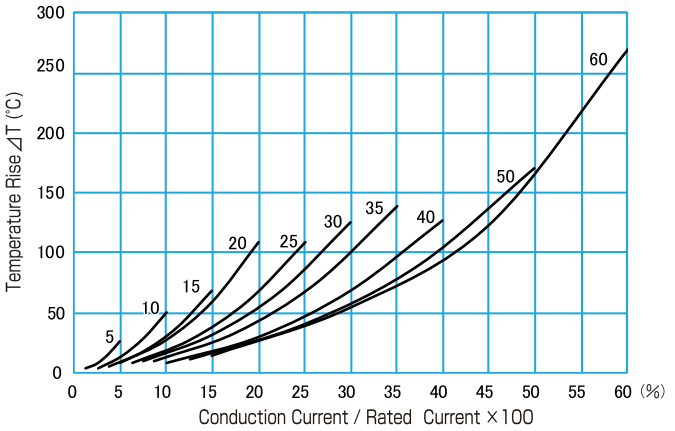


Temperature Rise

400KH

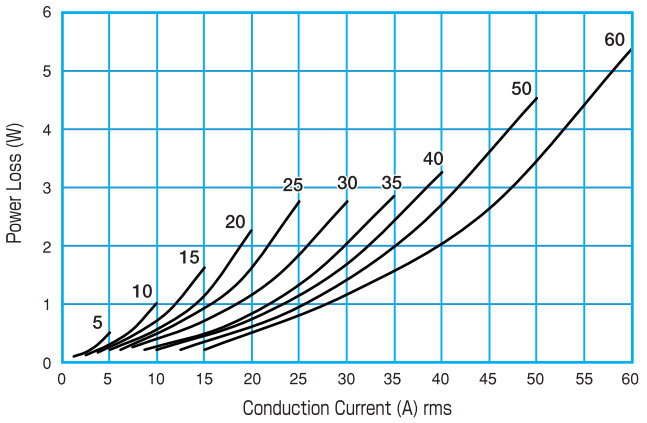


400KHK

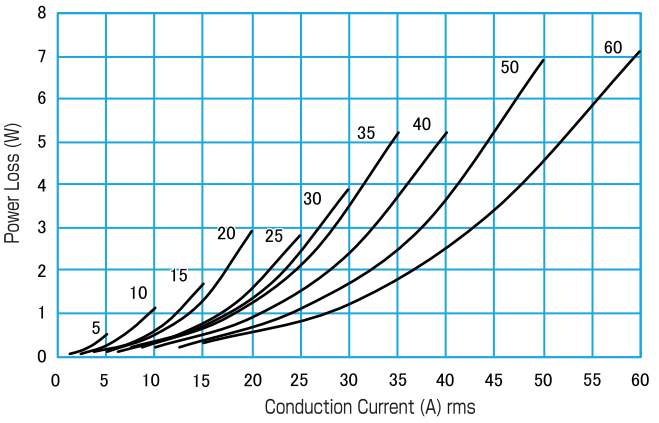


Power Loss

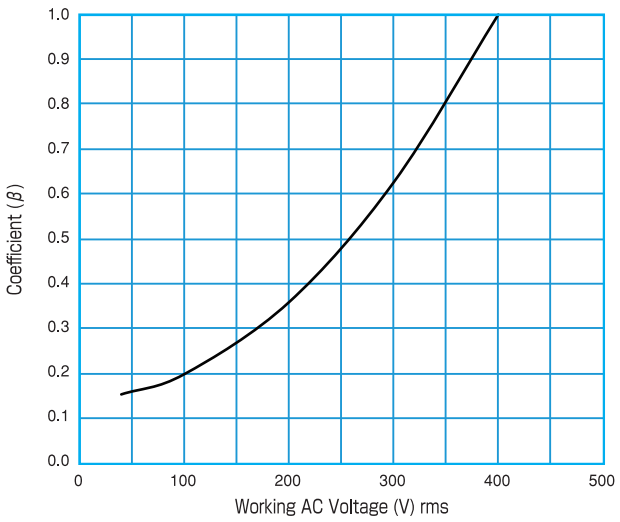
400KH



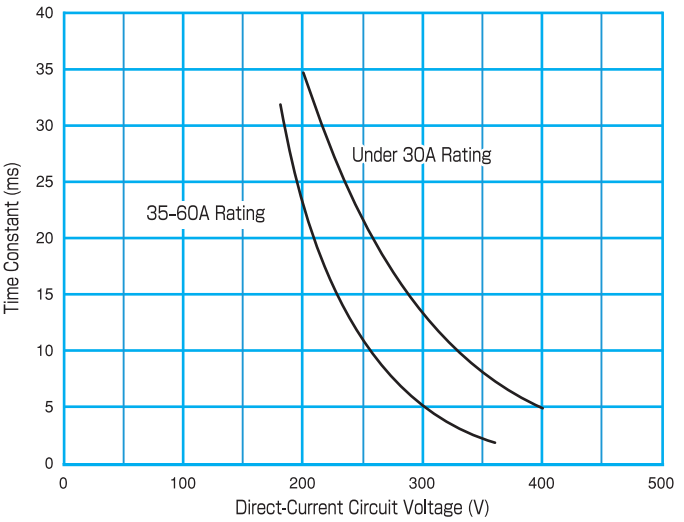
400KHK



Shutdown I^2t Against Working AC Voltage



Application to Direct-Current Circuit



Power Loss and Temperature Characteristics

●Testing Conditions for Board-Soldered-Type Fuses

The power loss and the temperature characteristics are studied using an FR-4 board (one-side board) and a 35-μm-thick copper foil with a copper foil width of 0.5 mm/A depending on the rated amperage (e.g., 5 mm width for a product rated at 10A).

500/400VSK/500VSH

FEATURES

Compact size enables smaller printed board use for servo, power conditioners and inverters.
This fuse is

- Fast acting and durable
- Useable with both AC and DC
- It is realized φ6.6×25㎜


500VSH


500VSK/400VSK

RATING

Rated Voltage and Blocking capacity:	500VSK/VSH : AC450V−10kA DC450V−10KA(L/R=1ms) 400VSK : AC400V−10kA DC400V−10kA(L/R=1ms)
Minimum block−off current:	500VSK/VSH : 2 times the rated amperage (conditons:DC450V L/R=0.1ms) 400VSK: DC300V : 6 times the rated amperage(L/R=1ms) DC400V : 16 times over the rated amperage(L/R=1ms)

UL/cUL standard approved rating

Rated voltage and blocking capacity:
500VSK/VSH:AC450V 10kA DC450V 10kA L/R=0.1ms

CCC standard approved rating

Rated voltage and blocking capacity:
AC400V 10kA DC300V 10kA L/R=10ms

CAUTION!

- Read "FOR SAFE USE" and "PROTECT FUSE USER' S GUIDE" at the back of this catalog before use.

Specifications

Type	Rated Amperage (A)	Fusing I²t (A²s)	Shutdown I2t (A²s)	Power Loss (W)	Weight (g)	Standard Approved
500VSH10 500VSK10	10	49	180	1.0	<VSH> 3.9 <VSK> 2.7	cULus
500VSH20 500VSK20	20	125	460	4.4		
500VSH36 500VSK36	36	400	1120	10.0		

Type	Rated Amperage (A)	Fusing I²t (A²s)	Shutdown I2t (A²s)	Tenperature Rise (⊿t1)※	Power Loss (W)	Weight (g)	Standard Approved
400VSK60M8	60	1800	3300	⊿T54.7℃ (30A energization)	1.9w (30A)	2.8	-

Dimensions

Fig 1
500VSK

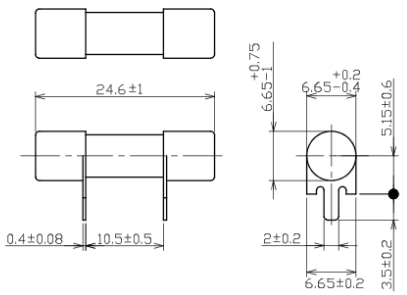
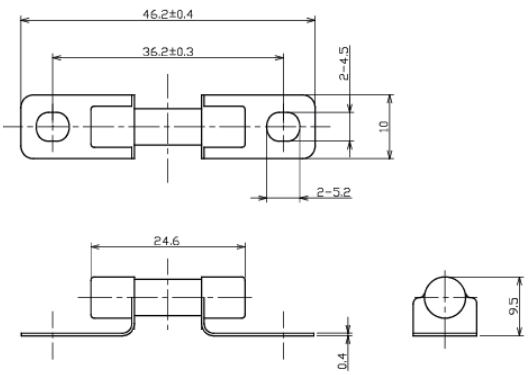
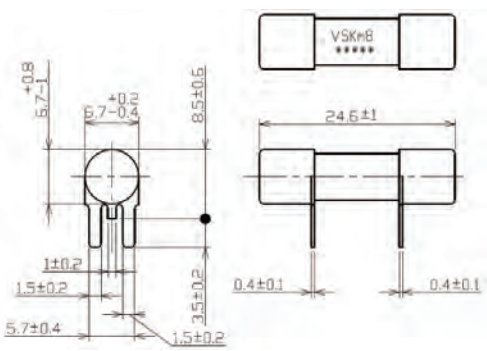
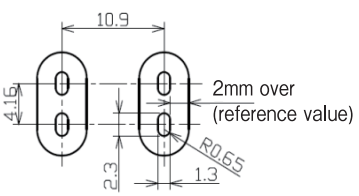


Fig 2
500VSH

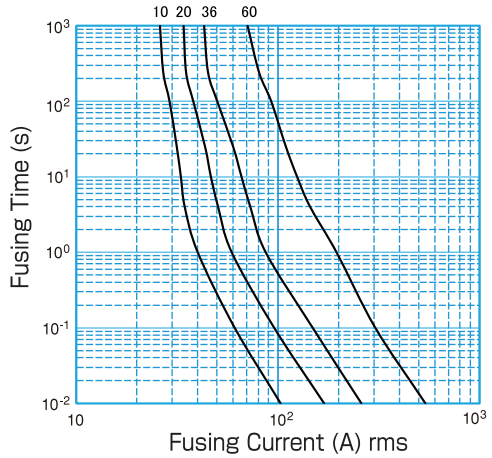


400VSK

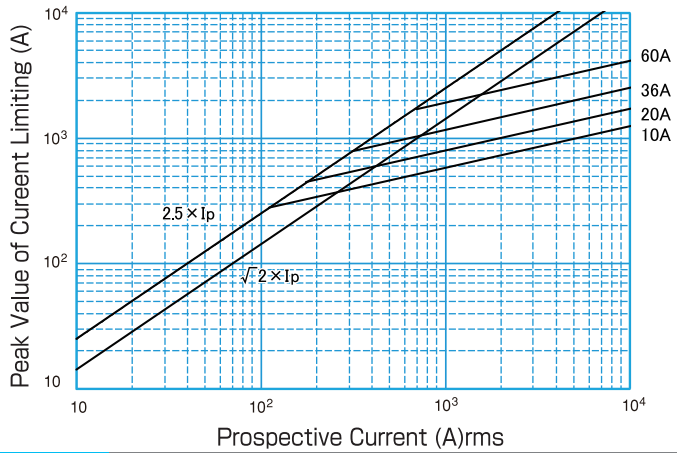




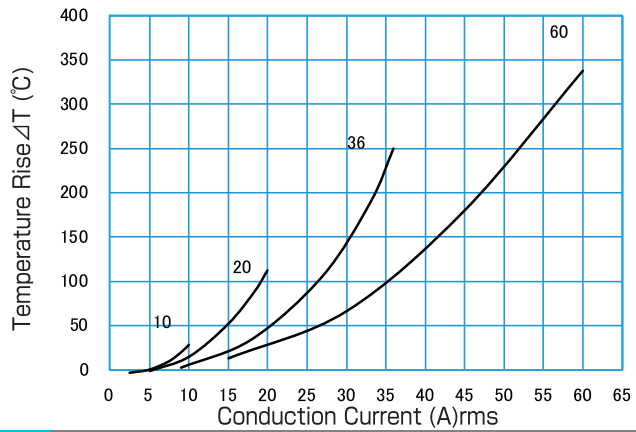
Fusing Characteristics 500VSK/400VSK



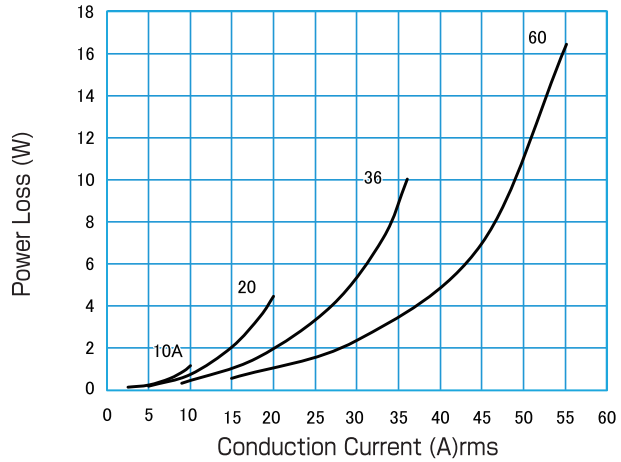
Current-Limiting Characteristics 500VSK/400VSK



Tenperature Rise 500VSK/400VSK



Power Loss 500VSK/400VSK



660CF/KH/KHK

FEATURES

- Three types are available for choice according to the installation method.
- Most suitable for small inverters, servos, UPSs, power supplies, etc.
- A 10-mm-ϕ fuse is compliant to the 60 A class.

RATING

●Rating 5 - 60 A

Rated voltage and blocking capacity : 660V AC-10kA, 660V DC (L/R = 10ms)-10kA

Minimum block-off current : 660V AC - 6 times the rated amperage
660V DC - 20 times the rated amperage
570V DC - 8 times the rated amperage

Maximum arc voltage : 1320V

CAUTION!

- Read "FOR SAFE USE" and "PROTECT FUSE USER' S GUIDE" at the back of this catalog before use.
- A small fuse may generate a relatively large amount of heat, so a fuse with sufficient capacity is recommended for long, continuous use.
- Fusing indication function is not provided.


660CF


660CF/KH/KHK


660KH


660KHK

UL / cUL standard approved rating

When applying the standard to UL standard approved items, use the fuse in the following rating.

●Rating 5 - 30 A

Rated voltage and blocking capacity : Same as the standard rating

●Rating 35 - 60 A

Rated voltage and blocking capacity : 660V AC-10kA, 570V DC (L/R = 2ms)-10kA
(660KH/KHK are not cUL approved.)

CCC standard approved rating

When applying the standard to CCC standard approved items, use the fuse in the following rating.

Rated voltage and blocking capacity : 660V AC-10kA, 450V DC (L/R = 10ms)-10kA

Specifications

Ta=25°C

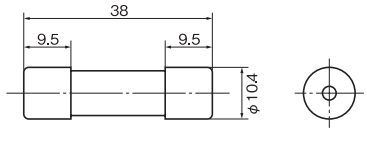
Type	Rated Amperage (A)	Fusing I²t (A²S)	Shutdown I²t (A²S) at AC660V 10KA	Power Loss (W)	Weight (g)	Fig	Standard Approved	Option
660CF-5 660KH-5 660KHK05	5	2	30	0.8 0.9	CF= 10.2 KH= 12.5 KHK= 10.5	CF= Fig 1 KH= Fig 2 KHK= Fig 3	c UL us CCC	Holder HK1038 HK1038UL Cover HC-10 Clip C-10CF *1*2
660CF-10 660KH-10 660KHK10	10	6	80	1.3 1.5				
660CF-15 660KH-15 660KHK15	15	12	170	3.0 3.0				
660CF-20 660KH-20 660KHK20	20	25	220	4.5 5.5				
660CF-25 660KH-25 660KHK25	25	43	490	5.0 6.1				
660CF-30 660KH-30 660KHK30	30	67	660	5.5 7.0				
660CF-35 660KH-35 660KHK35	35	99	1130	5.1 6.5				
660CF-40 660KH-40 660KHK40	40	177	1780	6.2 7.2				
660CF-50 660KH-50 660KHK50	50	264	2570	9.1 11.3				
660CF-60 660KH-60 660KHK60	60	314	2980	12.1 12.3				

*1 It is not fit for series KH/KHK.

*2 Continuous energizing current:30A.

Dimensions

Fig 1
660CF



Fuse Holder HK1038
(for 660CF) refer to p. 34

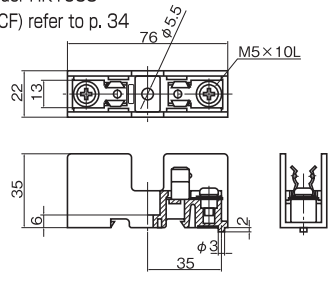


Fig 2
660K H

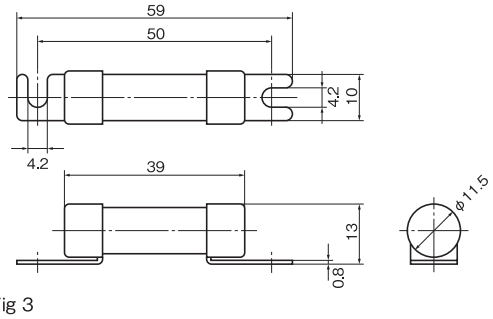
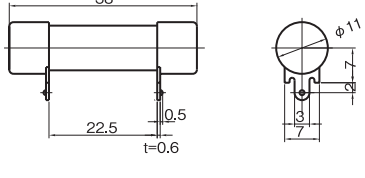
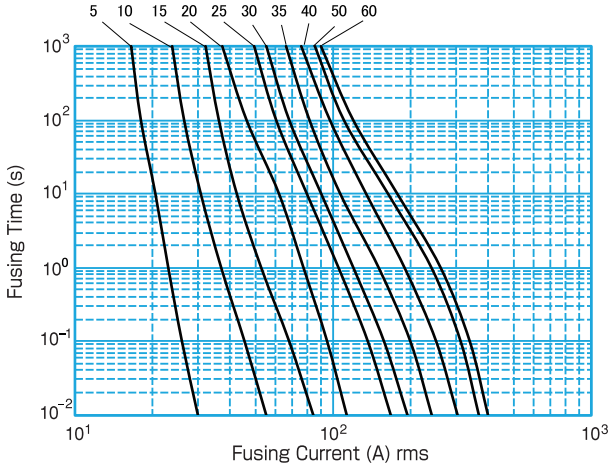


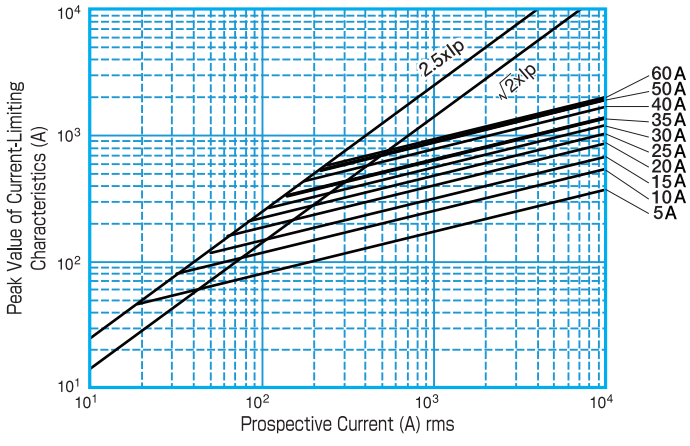
Fig 3
660KHK



Fusing Characteristics

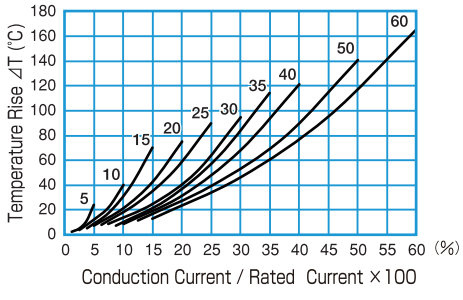


Current-Limiting Characteristics

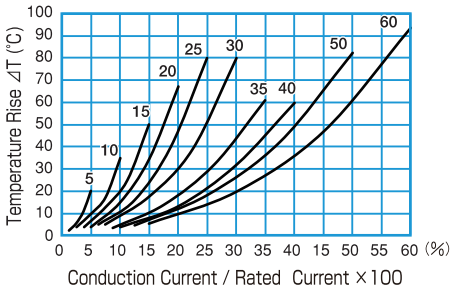


Temperature Rise

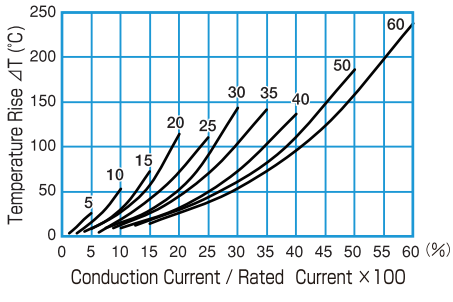
CF



KH

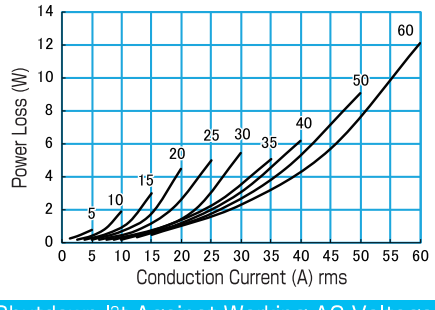


KHK

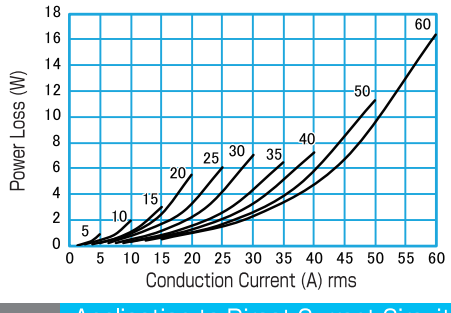


Power Loss

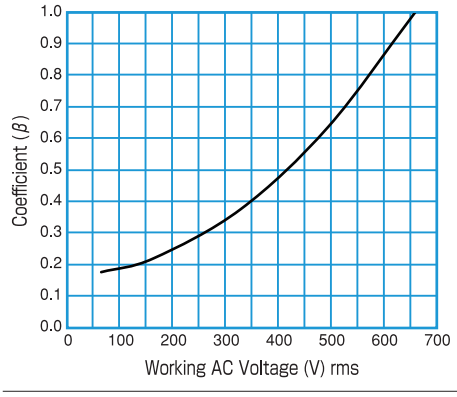
CF/KH



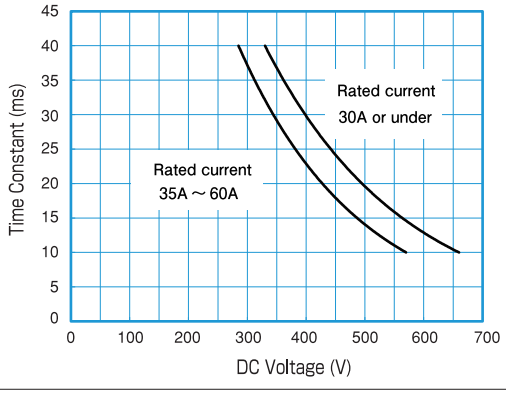
KHK



Shutdown I^2t Against Working AC Voltage



Application to Direct-Current Circuit



Power Loss and Temperature Characteristics

●Testing Conditions for Board-Soldered-Type Fuses

The power loss and the temperature characteristics are studied using an FR-4 board (one-side board) and a 35-μm-thick copper foil with a copper foil width of 0.5 mm/A depending on the rated amperage (e.g., 5 mm width for a product rated at 10A).

700CF/800CF/1000CF

FEATURES

- 800V DC prepared for the regeneration voltage of 400V servos/inverters. *800CF
- Designed for small-capacity power-supply lines of a high-voltage inverter.

RATING

●Rating 700CF- 35 to 40 A

Rated voltage and blocking capacity : 700V AC-100kA, 700V DC (L/R = 10ms)-100kA
Minimum block-off current : 700V AC/DC - 4 times the rated amperage
Maximum arc voltage : 1400V

●Rating 800CF- 5 to 30 A

Rated voltage and blocking capacity : 700V AC-100kA, 800V DC (L/R =10ms)-10kA
Minimum block-off current : 700V AC/800V DC - 4 times the rated amperage
Maximum arc voltage: 1600V

●Rating1000CF

Rated voltage and blocking capacity: 1000V AC-100kA
Minimum block-off current: 1000V AC - 4 times the rated amperage
Maximum arc voltage: 2000V

UL standard approved rating

When applying the standard to UL standard approved items, use the fuse in the following rating.

●800CF

Rated voltage and blocking capacity : 660V AC -10kA
800V DC (L/R = 10ms)-10kA

CAUTION!

- Read "FOR SAFE USE" and "PROTECT FUSE USER' S GUIDE" at the back of this catalog before use.
- A small fuse may generate a relatively large amount of heat, so a fuse with sufficient capacity is recommended for long, continuous use.
- Fusing indication function is not provided.

Specifications 700CF/ 800CF

Ta=25℃

Type	Rated Amperage (A)	Fusing I²t (A²S)	Shutdown I²t (A²S) at AC660V-10KA	Shutdown I²t (A²S) at AC700V-100KA	Power Loss (W)	Weight (g)	Standard Approved	Option
800CF-5	5	2	28	36	1.1	26.5	UL	Holder HK1551 Cover HC-15 *1
800CF-10	10	6	80	110	2.6			
800CF-15	15	12	160	225	4.5			
800CF-20	20	25	310	360	6.0			
800CF-25	25	43	390	650	6.5			
800CF-30	30	67	530	1000	7.0			
700CF-35	35	93	—	1300	7.5		—	
700CF-40	40	121	—	1980	7.5			

*1 Continuous energizing current:40A.

Specifications 1000CF

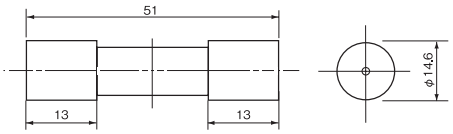
Ta=25℃

Type	Rated Amperage (A)	Fusing I²t (A²S)	Shutdown I²t (A²S) at AC1000V-100KA	Power Loss (W)	Weight (g)	Standard Approved	Option
1000CF-5	5	1.2	50	2.1	32	—	Holder HK1567 Cover HC1567 *1
1000CF-10	10	8.7	250	3.2			
1000CF-15	15	19.6	510	6.6			
1000CF-20	20	44.2	1150	7.2			
1000CF-30	30	123.0	3060	7.6			
1000CF-35	35	177.1	5110	8.3			

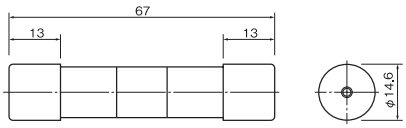
*1 Continuous energizing current:30A.

Dimensions

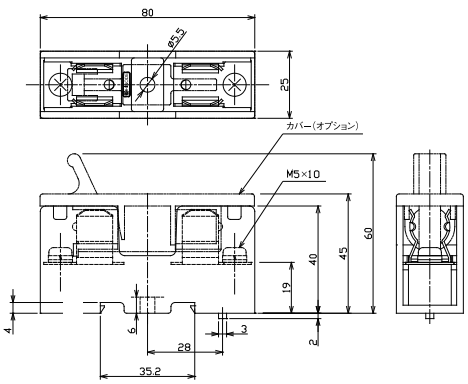
700CF/800CF



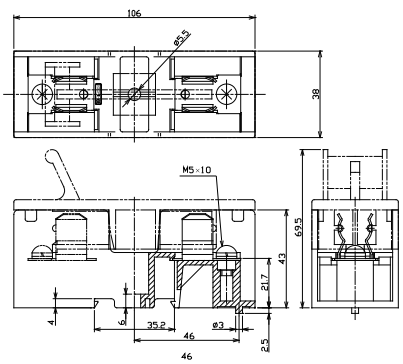
1000CF



HK1551+HC-15

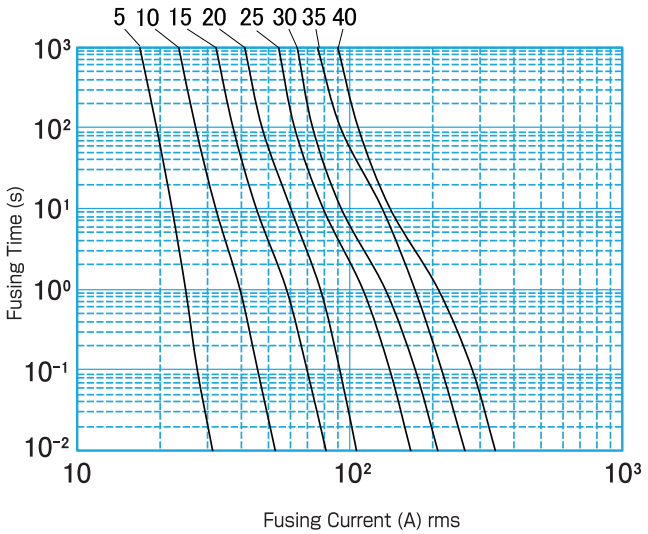


HK1567+HC1567

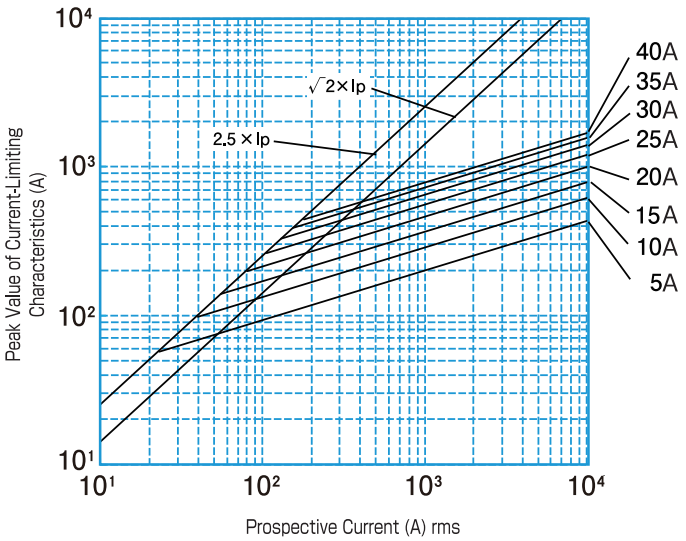


700CF/800CF

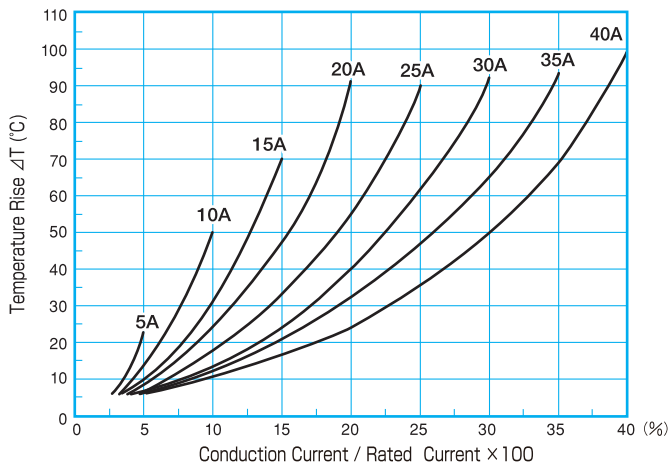
Fusing Characteristics



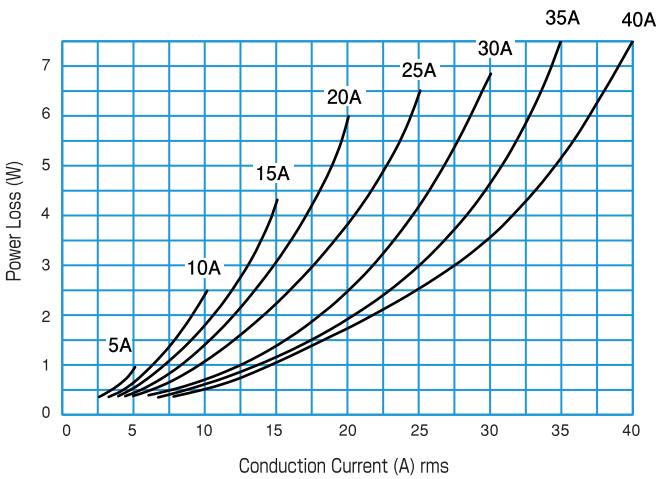
Current-Limiting Characteristics



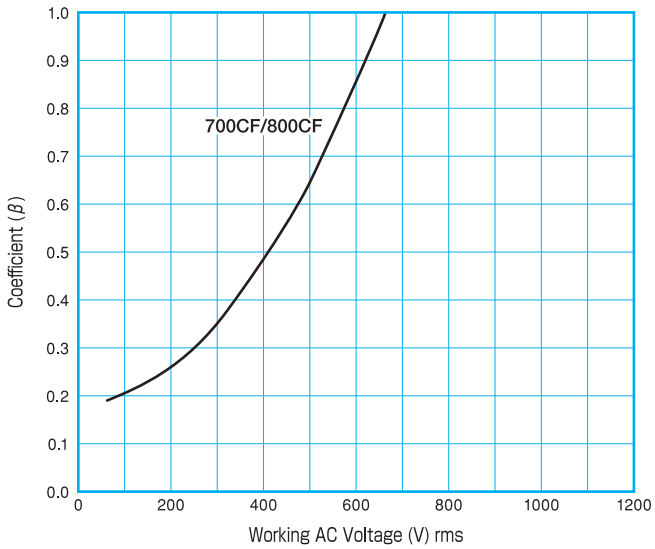
Temperature Rise



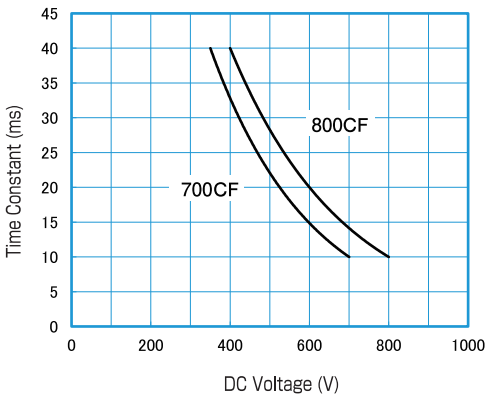
Power Loss



Shutdown I²t Against Working AC Voltage

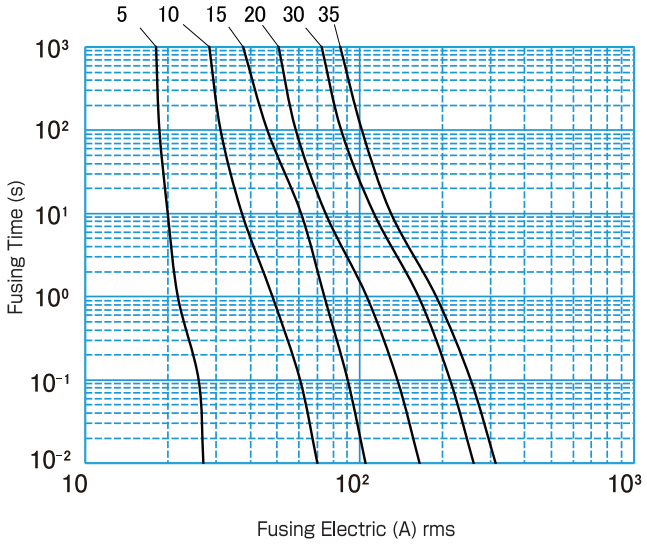


Application to Direct-Current Circuit

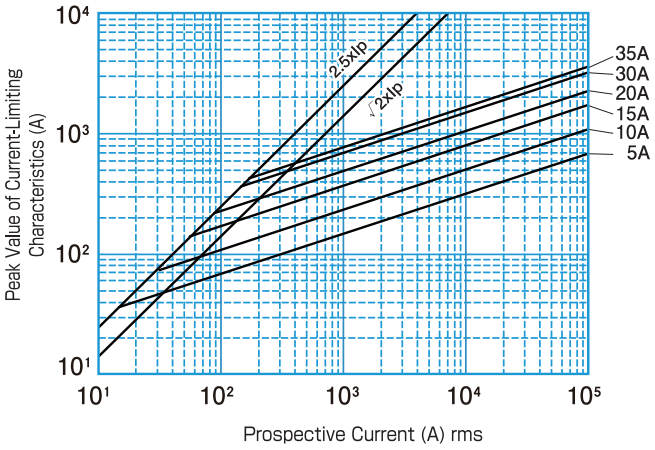


1000CF

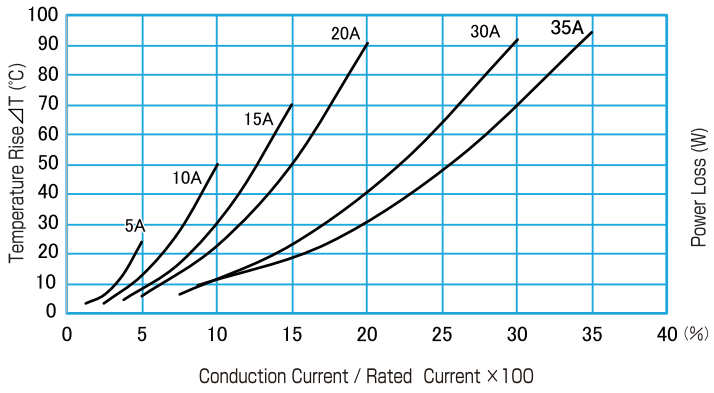
Fusing Characteristics



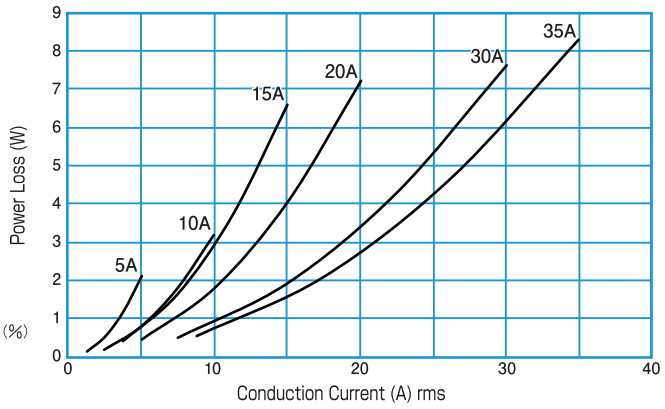
Current-Limiting Characteristics



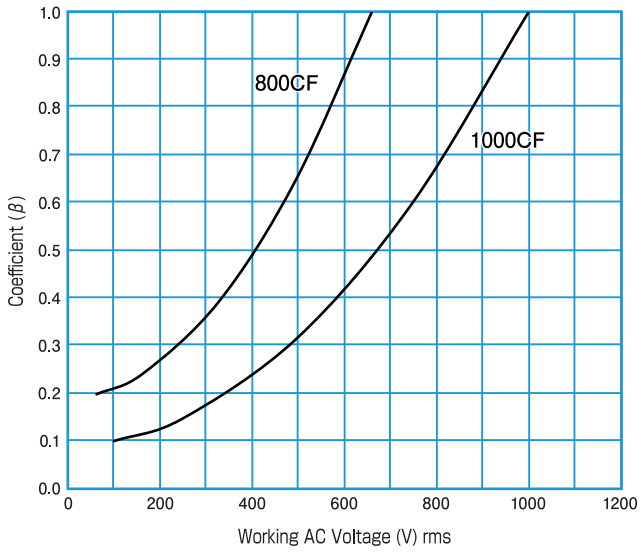
Temperature Rise



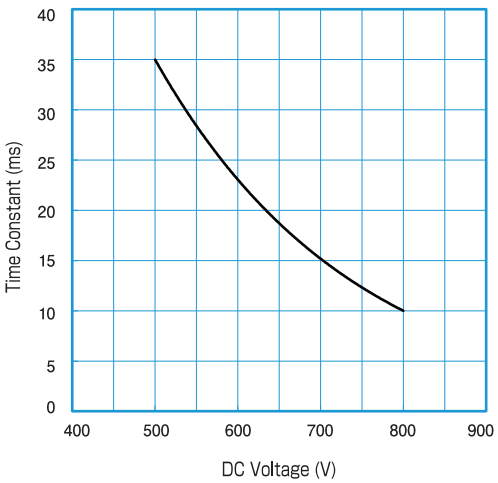
Power Loss



Shutdown I²t Against Working AC Voltage



Application to Direct-Current Circuit



FEATURES

- It is available to attach an alarm indicating fuse(microswitch can be installed).
- Also compliant to 400V DC (350GH)

RATING

●250GH

Rated voltage and blocking capacity : 250V AC-100kA, 250V DC (L/R = 10ms)-100kA
Minimum block-off current : 250V AC/DC - 5 times the rated amperage
Maximum arc voltage : 550V

●350GH

Rated voltage and blocking capacity : 250/350V AC-100kA, 400V DC (L/R = 2ms)-10kA
Minimum block-off current : 350V AC/400V DC - 5 times the rated amperage
Maximun arc voltage:700V 800V

CAUTION!

- Read "PROTECT FUSE USER' S GUIDE" and "FOR SAFE USE" at the back of this catalog before use.
- When purchasing a product with an Alarm indicating Fuse, enter "S" immediately after the ampere rating in the product name (e.g. 350GH-200S).
- The minimum working voltage of the alarm fuse is 10V.

UL / cUL standard approved rating

When applying the standard to UL standard approved items, use the fuse in the following rating.

●250GH (cUL not approved)

Rated voltage and blocking capacity : 250V AC-100kA, 250V DC (L/R = 10ms)-100kA

●350GH

Rated voltage and blocking capacity : 380V AC-10kA, 400V DC (L/R = 2ms)-10kA

CCC standard approved rating

●350GH

When applying the standard to CCC standard approved items, use the fuse in the following rating.
Rated voltage and blocking capacity : 350V AC-50kA, 250V DC (L/R = 10ms)-50kA

Specifications

Ta=25℃

Type	Rated Amperage (A)	Fusing I²t (A²S)	Shutdown I²t (A²S) at AC250V-100KA	Shutdown I²t (A²S) at AC350V-100KA	Power Loss (W)	Dimensions (mm) A	B	C	D	E	F	G	H	W	T	M	Weight (g)	Fig	Standard Approved	Option
350GH-016	16	20	230	430	1.5	55	41±3	25	27max	17.5	9.5	6.5	18	12	2		29.5	1	cULus	Holder HT4017 HT4017T2 *1 Cover HCT4017 Isolation board HP40
350GH-020	20	35	370	680	1.7															
350GH-025	25	55	530	980	2.1															
350GH-032	32	80	720	1320	3.0															
350GH-040	40	142	1140	2090	3.6															
350GH-050	50	222	1660	3010	4.7															
350GH-063	63	370	2220	4010	6.9															
350GH-080	80	568	3540	6390	8.2															
350GH-100	100	888	5220	9310	10.0															
350GH-125	125	1280	6880	12280	13.0	78	57±3	29	32max	23	14	9	27	20	3	—	79		cULus	Holder HT5723 *2 Cover HCT5723 Isolation board HP5723
350GH-160	160	2275	11080	19540	17.5															
350GH-200	200	3555	16160	28000	24.0															
350GH-250	250	6480	26280	45450	29.8	87	60±3	30	41max	31	16	10.8	35	25	3	—	134		cULus	
350GH-315	315	8000	32670	55790	48.0															
250GH-350	350	7400	61990	—	52.0															
250GH-400	400	11000	162120	—	45.0	86	61±3	30	46max	37	13	11	42	30	3	—	187			
250GH-450	450	13500	92000	—	50.0															
250GHW500	500	24000	200880	—	58.0	86	61±3	30	46max	37	13	11	44	30	6	82	380	2		
250GHW630	630	30000	364400	—	76.0															
250GHW710	710	43000	584670	—	82.0															
250GHW800	800	53000	647480	—	93.0															

*1 Continuous energizing current:75A.
*2 Continuous energizing current:100A.

Dimensions

Fig 1

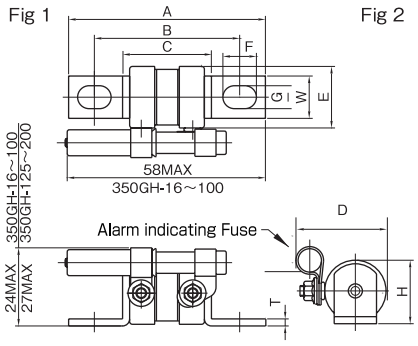
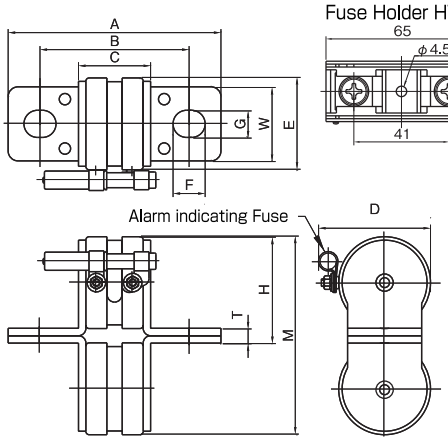
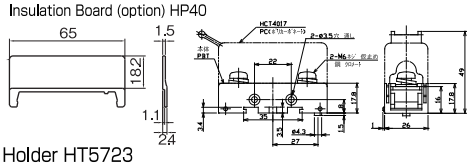


Fig 2

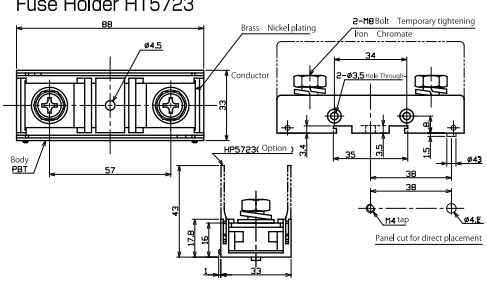


Fuse Holder HT4017 (refer to P.34)

Insulation Board (option) HP40

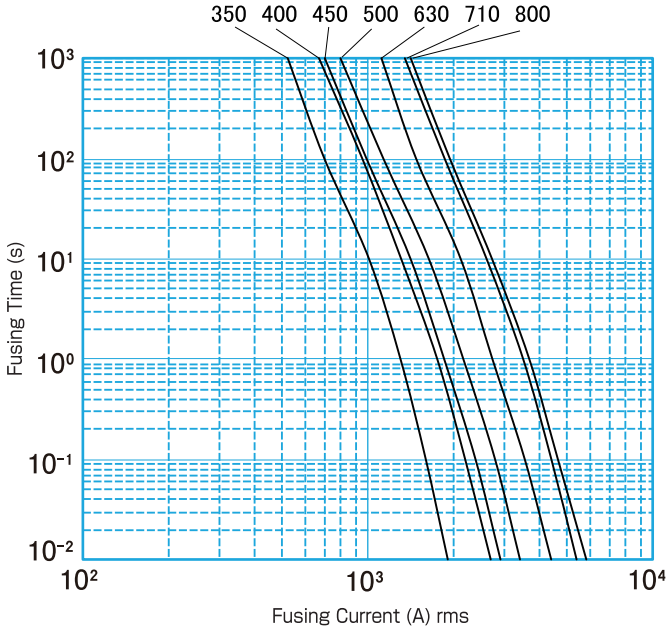


Fuse Holder HT5723

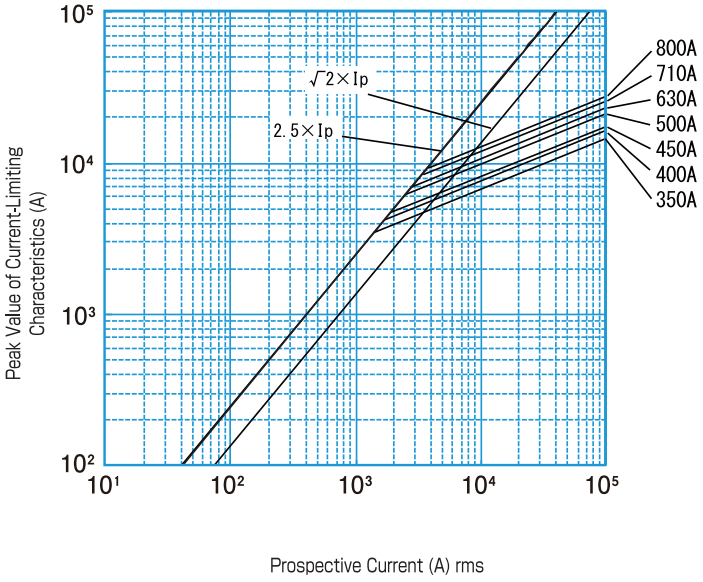


250GH

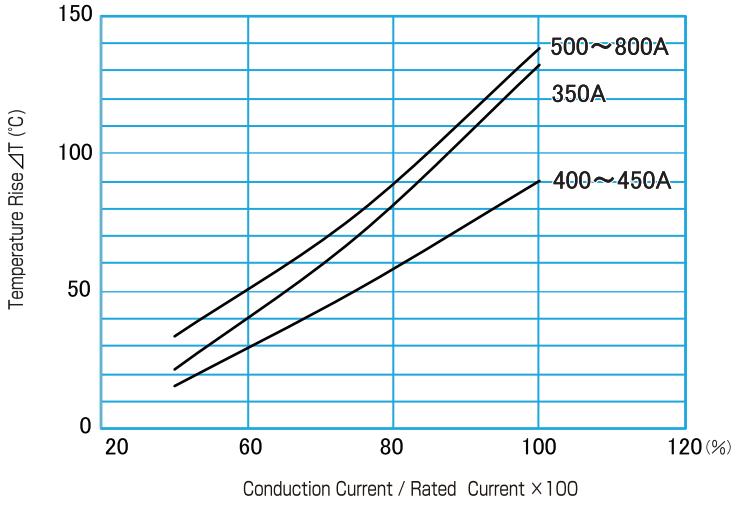
Fusing Characteristics



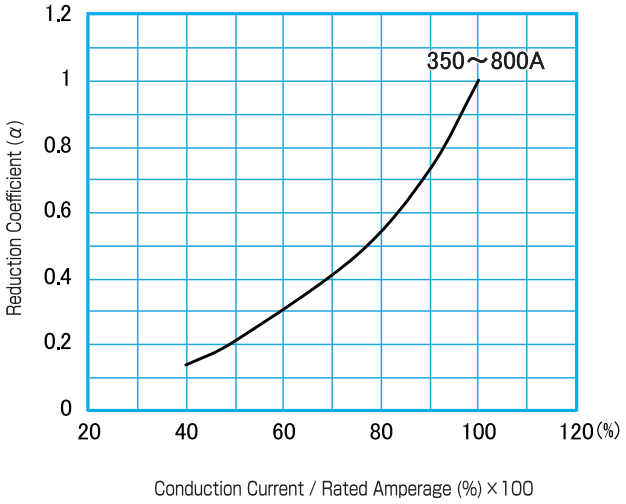
Current-Limiting Characteristics



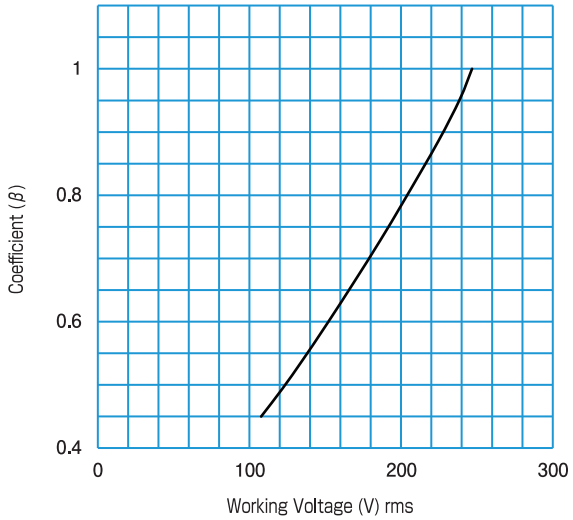
Temperature Rise



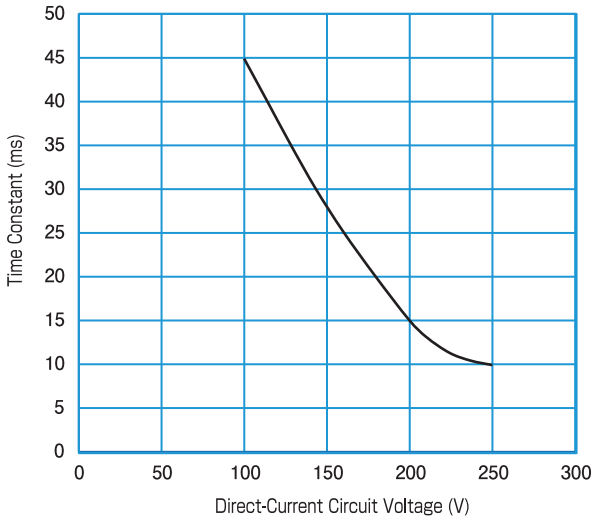
Power Loss



Shutdown I²t Against Working AC Voltage

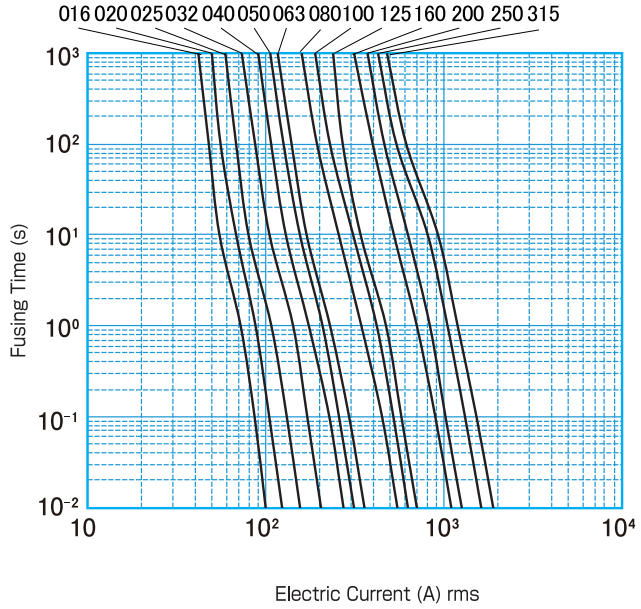


Application to Direct-Current Circuit

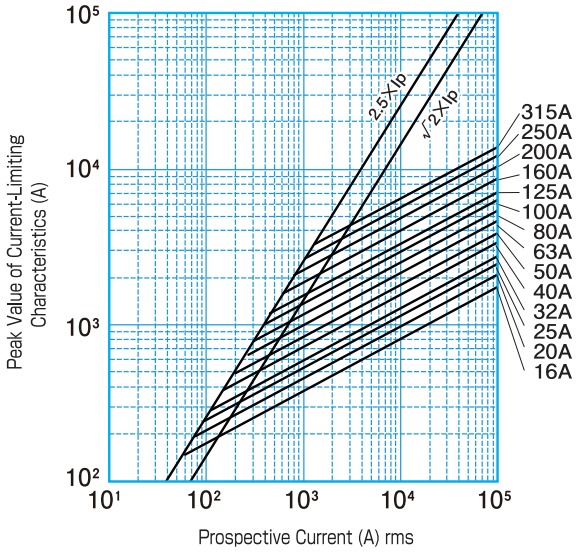


350GH

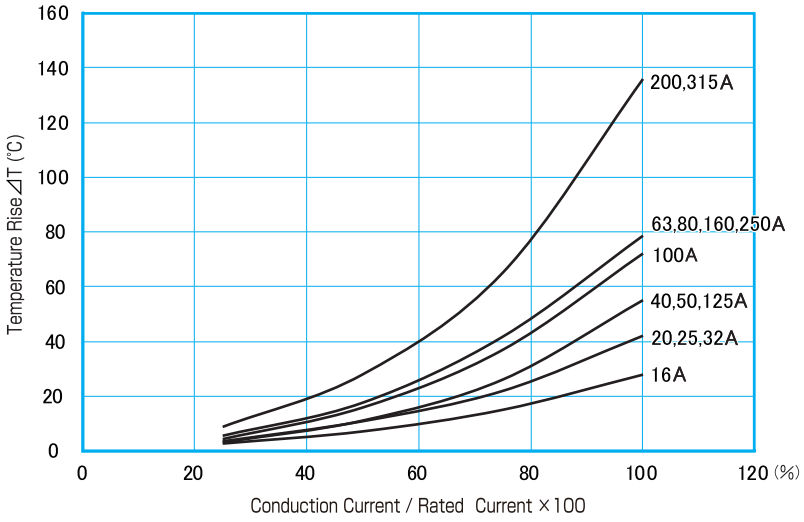
Fusing Characteristics



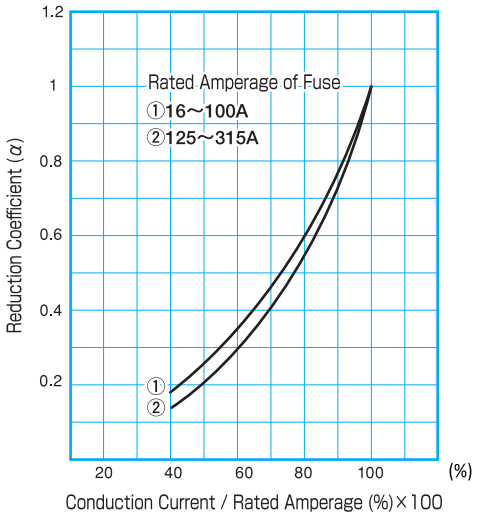
Current-Limiting Characteristics



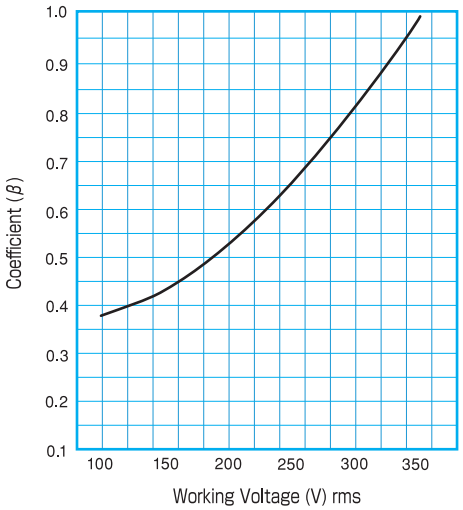
Temperature Rise



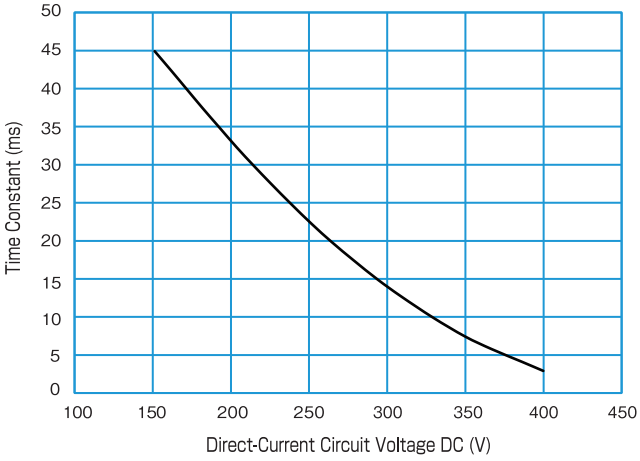
Power Loss



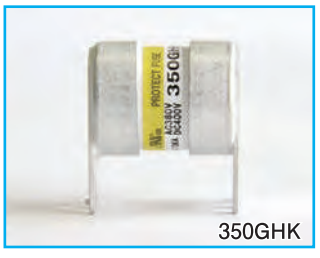
Shutdown I²t Against Working AC Voltage



Application to Direct-Current Circuit



350GHK



FEATURES

- Requires little installation space on substrates. L=22mm
- Also compliant to 400V DC.

RATING

Rated voltage and breaking capacity : 380V AC-10kA, 400V DC -10kA(L/R = 2ms)
Minimum breaking current : 380V AC/400V DC - 8 times the rated amperage
Maximum arc voltage : 700V

cUL standard approved rating

Same as the standard rating

CCC standared approved rating

When applying the standard to CCC standard approved itmes,
use the fuse in the following rating.
Rated voltage and blocking capacity:AC350V-50kA DC250V(L/R10ms)-50kA

CAUTION!

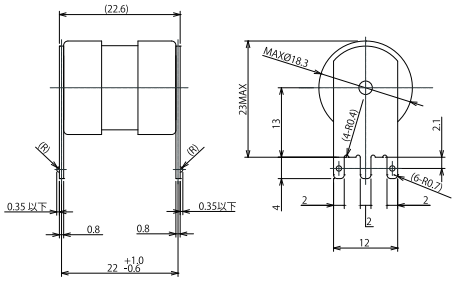
- Read "FOR SAFE USE" at the back of this catalog before use.
- Fuse should be used less than 50% of their rated current.
- Arc re-ignition may occur if the fusing current is less than 8 times larger than the fuse.
- The power loss and the temperature characteristics are studied using an FR-4 board (one-side board) and a 35-μm-thick copper foil with a copper foil width of 2mm/A depending on the rated amperage (e.g. 50 mm width for a product rated at 100 A).
- Use it at 50% or less of the rated current.

Specifications

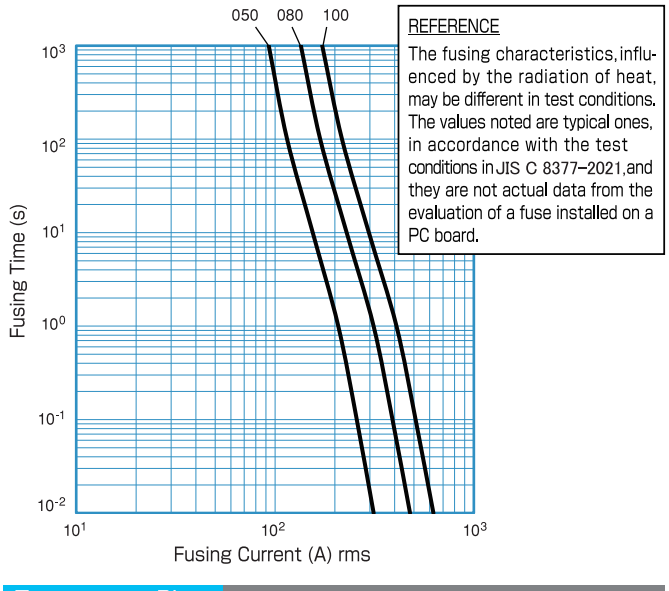
Ta=25℃

Type	Rated Amperage (A)	Fusing I²t (A²S)	Shutdown I²t (A²S) at AC380V 10kA	Power Loss (W)	Weight (g)	Standard approved
350GHK050	50	222	3510	5.1	22.5	
350GHK080	80	568	7440	10.1		
350GHK100	100	888	10810	16.5		

Dimensions

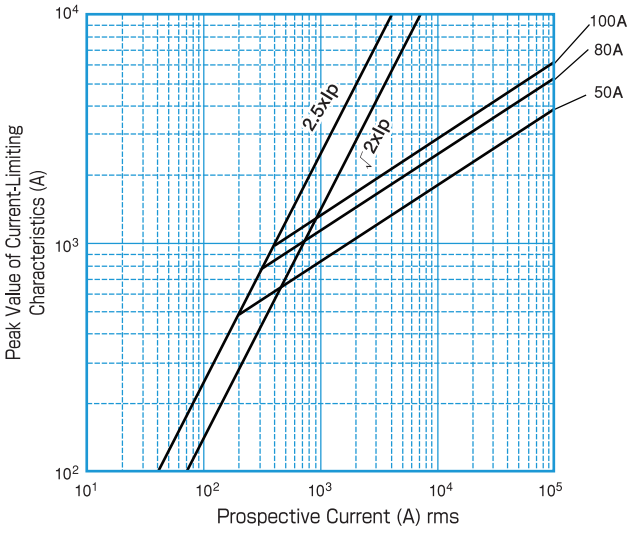


Fusing Characteristics

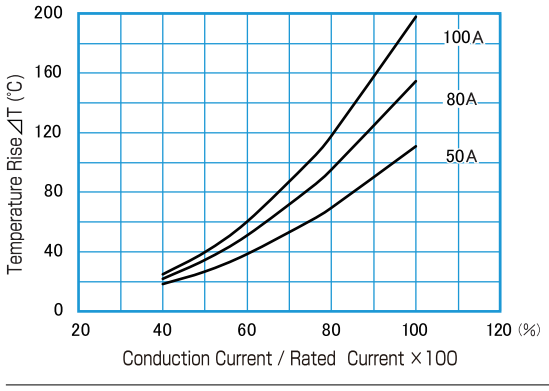


REFERENCE
The fusing characteristics, influenced by the radiation of heat, may be different in test conditions. The values noted are typical ones, in accordance with the test conditions in JIS C 8377-2021, and they are not actual data from the evaluation of a fuse installed on a PC board.

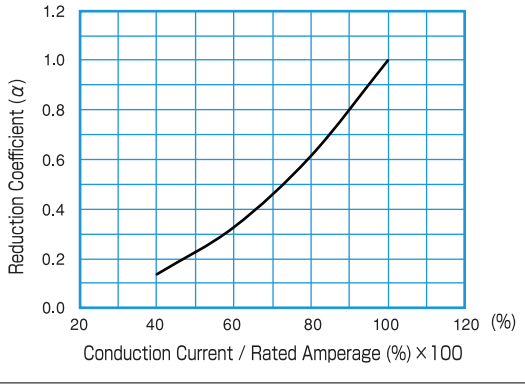
Current-Limiting Characteristics



Temperature Rise



Power Loss



660GH

FEATURES

- It is available to attach an alarm indicating fuse(microswitch can be installed).
- It is also effective as a fuse with high blocking performance for systems operating at 200V.


660GH-040


660GH-315

RATING

Rated voltage and blocking capacity : 660V AC-100kA, 660V DC (L/R = 10ms)-100kA
Minimum block-off current : 660V AC/DC - 5 times the rated amperage
Maximum arc voltage : 1400V

UL standard approved rating

Rated voltage and blocking capacity: Same as the standard rating

CCC standard approved rating

When applying the standard to CCC standard approved items, use the fuse in the following rating.

Rated voltage and blocking capacity : 660V AC-50kA
450V DC (L/R=10ms)-50kA

CAUTION!

- Read "FOR SAFE USE" and "PROTECT FUSE USER' S GUIDE" at the back of this catalog before use.
- When purchasing a product with an Alarm indicating Fuse, enter "S" immediately after the ampere rating in the product name (e.g. 660GH-100S).
- The minimum working voltage of the alarm fuse is 10V.

Specifications

Ta=25℃

Type	Rated Amperage (A)	Fusing I²t (A²S)	Shutdown I2T(A2S) at AC660V-100kA	Power Loss (W)	Dimensions (mm)											Weight (g)	Fig	Standard Approved	Option
					A	B	C	D	E	F	G	H	W	T	M				
660GH-016	16	19	300	2.4	76.7	62.7 ±3	46	27 max	18.5 max	9.5	6.5	18	2	12	—	41	1	cULus	Holder HT6017 HT6017T2 *1 Cover HCT6017 Isolation board HP60
660GH-025	25	42	670	4.0															
660GH-032	32	74	920	6.0															
660GH-040	40	100	1350	7.0															
660GH-050	50	167	2230	9.0															
660GH-063	63	300	3910	12.0															
660GH-080	80	400	5310	17.0															
660GH-100	100	670	8790	22.0															
660GH-125	125	1200	15630	25.0	98	78	50	32 max	25 max	14	9	26	3	20	—	100			Holder HT7723 Cover HCT7723 Isolation board HP7723 *2
660GH-160	160	2100	27760	35.0															
660GH-200	200	3300	47490	40.0															
660GH-250	250	6000	69450	50.0	108	82±3	51	41 max	31	16	10.5	35	3	25	—	180			
660GH-315	315	7400	93750	80.0															
660GH-350	350	11000	167930	70.0	107	81.5±3		46 max	37	13	11	40	3	30	—	260			
660GH-400	400	14000	186240	93.8															
660GH-450	450	24000	283420	85.0								43	6		80	530	2		
660GH-500	500	29000	416530	95.0															
660GH-630	630	42000	609720	105.0															
660GH-710	710	51000	739930	150.2															

*1 Continuous energizing current:75A.
*2 Continuous energizing current:100A.

Dimensions

Fig 1

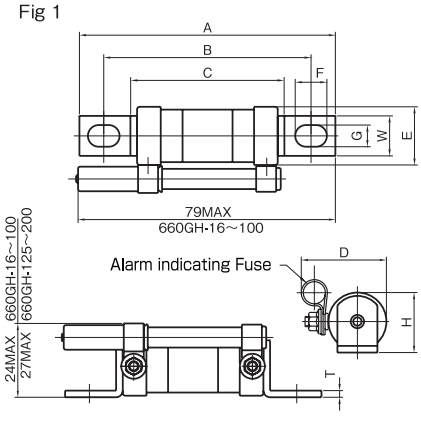
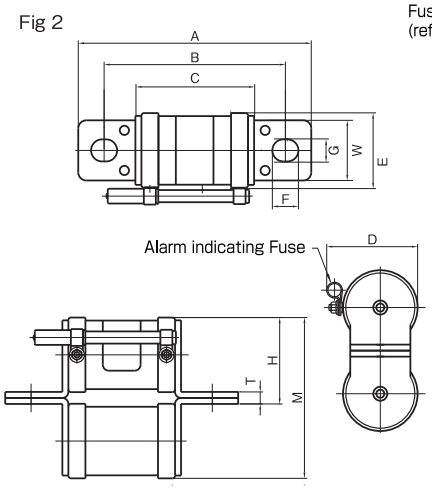
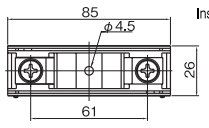


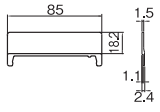
Fig 2

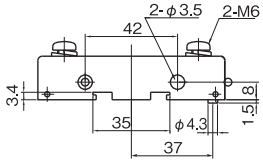


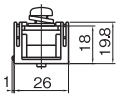
Fuse Holder HT6017
(refer to P.35)

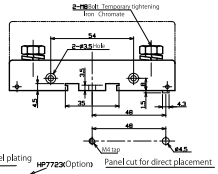


Insulation Board (option) HP60

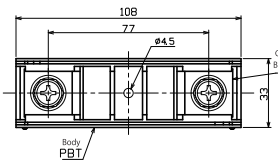


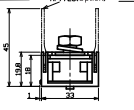




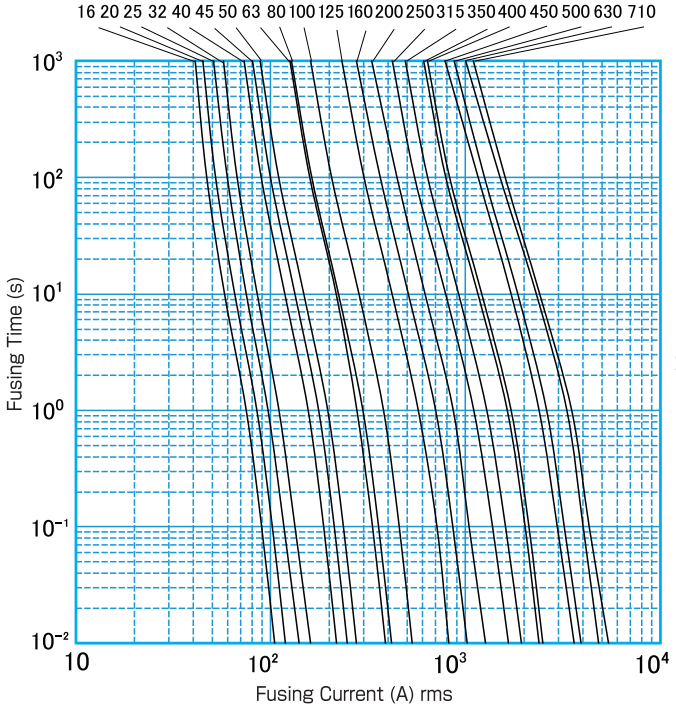


Fuse Holder HT7723

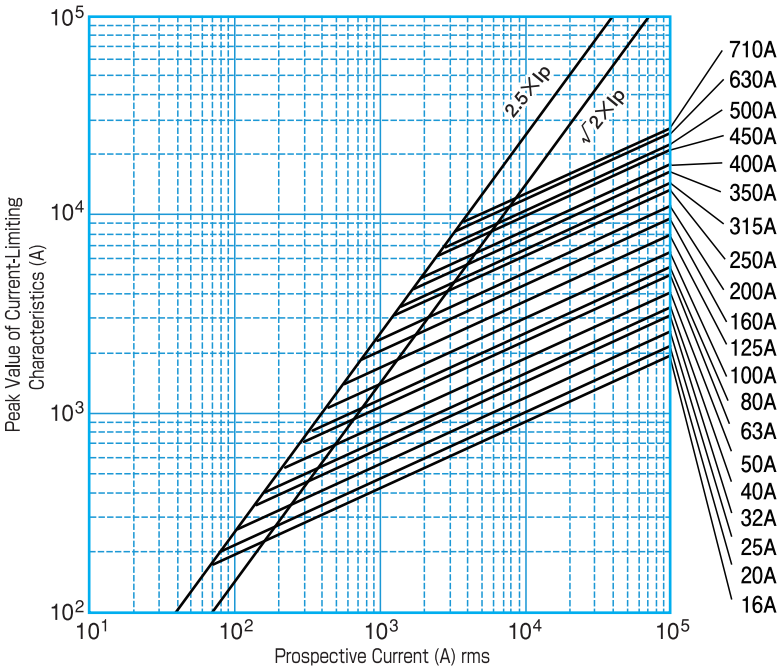




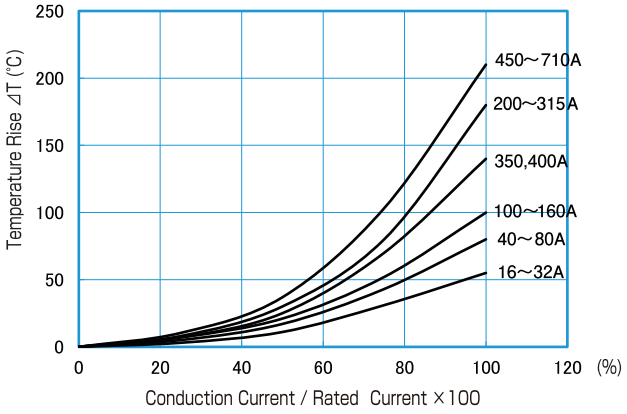
Fusing Characteristics



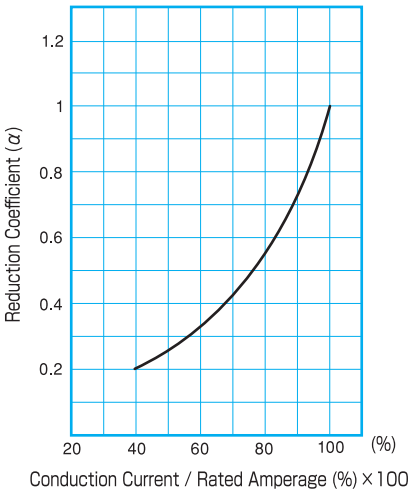
Current-Limiting Characteristics



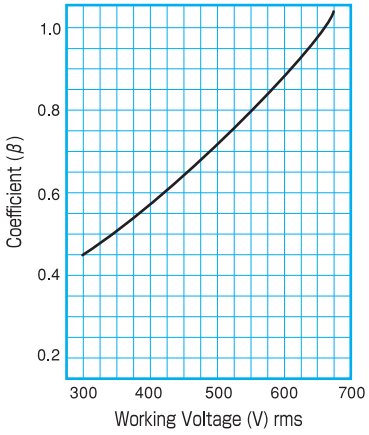
Temperature Rise



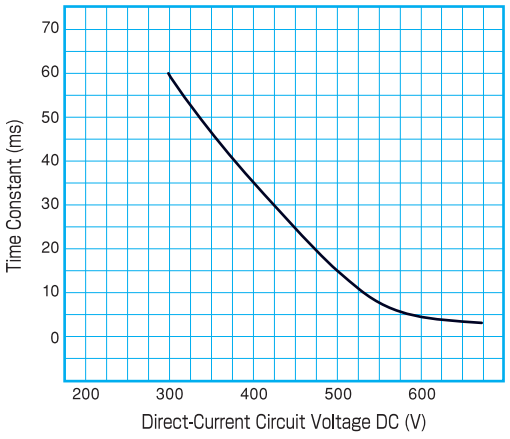
Power Loss



Shutdown I²t Against Working AC Voltage



Application to Direct-Current Circuit



FEATURES

- 750GHK series is a substrate-mounted fuse, effectively reducing power and space requirements.
  (Suitable for inverter, UPS, power supply use)
- High voltage (AC850 DC750)

RATING

Rated voltage and breaking capacity
UL recognized: 850V AC-10kA, 750V DC-10kA (L/R=2ms)
CCC recognized: 850V AC-50kA, 600V DC-50kA (L/R=10ms)
Minimum breaking current: 850V AC/750V DC-8 times the rated amperage
Maximum arc voltage: 1700V

CAUTION!

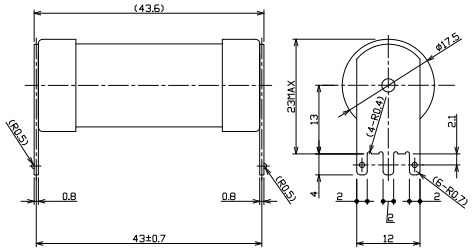
- Read "FOR SAFE USE" at the back of this catalog before use.
- Fuse should be used less than 50% of their rated current.
- Arc re-ignition may occur if the fusing current is less than 8 times larger than the fuse.
- The power loss and the temperature characteristics are studied using an FR-4 board (one-side board) and a 35-μm-thick copper foil with a copper foil width of 2mm/A depending on the rated amperage (e.g.50mm width for a product rated at 100A).
- Use it at 50% or less of the rated current.

Specifications

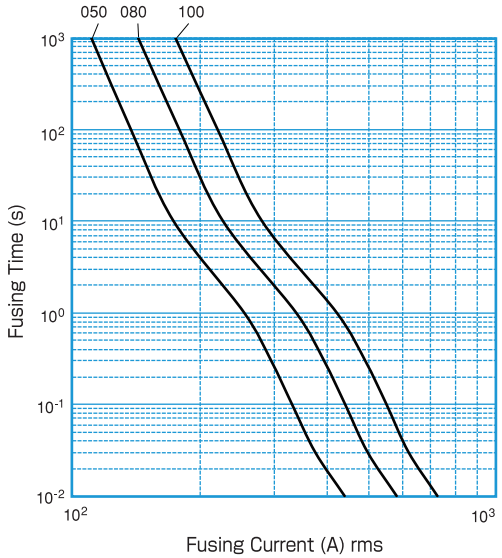
Ta=25℃

Type	Rated Amperage (A)	Fusing I^2t (A^2S)	Shutdown I^2t (A^2S) at AC850V 10kA	Power Loss (W)	Weight (g)	Standard Approved
750GHK050	50	311.5	9040	9.3	34	
750GHK080	80	553.8	12050	18.0		
750GHK100	100	865.3	15150	30.4		

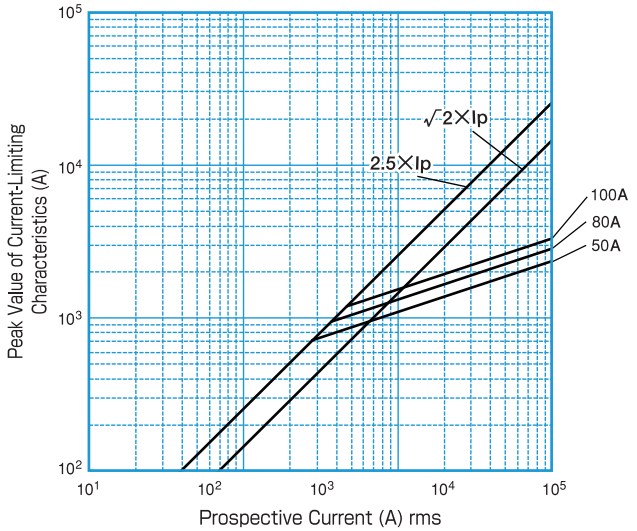
Dimensions



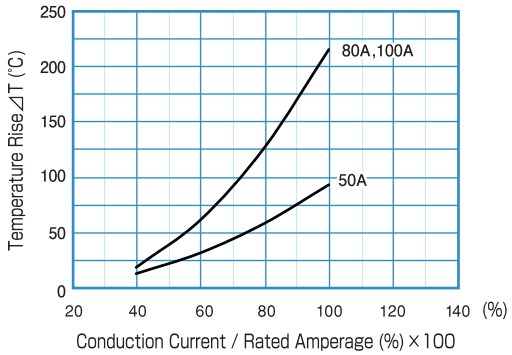
Fusing Characteristics



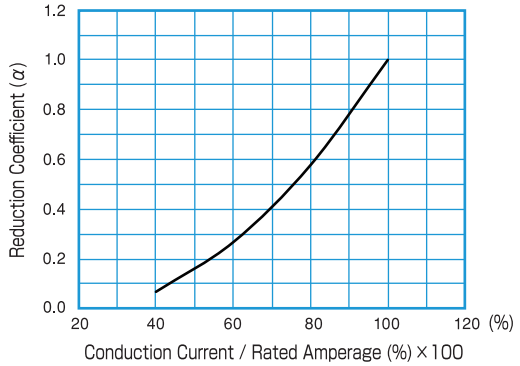
Current-Limiting Characteristics



Temperature Rise



Power Loss



750GH

FEATURES

- It is available to attach an alarm indicating fuse(microswitch can be installed).
- It is also effective as a fuse with high blocking performance for systems operating at 200V.
- It is as the same size as the 660GH series and supports AC 850V / DC 750V.

RATING

Rated voltage and blocking capacity:AC850V-10kA／DC750V-10kA(L/R2ms)

Minimum block-off current:
20～40A:**AC850/DC750V-**20Times the rated amperage
50～710A:**AC850V/DC750V-**8Times the rated amperage

Maximum arc voltage:1900V

CAUTION!

- Read "FOR SAFE USE" at the back of this catalog before use.
- When purchasing a product with an Alarm indicating Fuse, enter "S" immediately after the ampere rating in the product name (e.g 750GH-100S).
- The minimum working voltage of the al arm fuse is 10 V.

UL standard approved rating

- Rated voltage and blocking capacity: Same as the standard rating.
- 20UL～40UL,450,500UL are only "AC"

CCC standard approved rating

When applying the standard to CCC standard approved itmes, use the fuse in the following rating.

Rated voltage and blocking capacity :
AC850V-60kA DC600V-50kA(L/R10ms)

Specifications

Ta=25℃

Type	Rated Amperage (A)	Fusing I²t (A²S)	Shutdown I2t (A2S) at AC850V 10kA	Power Loss (W)	Dimensions (mm) A	B	C	D	E	F	G	H	T	W	M	Weight (g)	Standard Approved	Fig	Option
750GH-020	20	43.8	670	2.7	76.7	62.7	46	27 max	18.5 max	9.5	6.5	18	2	12	—	41	cULus	1	Holder HT6017 HT6017T2 Cover HCT6017 Isolation board HP60 *1
750GH-025	25	54.1	930	3.9															
750GH-032	32	65.4	1000	6.5															
750GH-035	35	106.0	1530	5.9															
750GH-040	40	175.0	2520	6.1															
750GH-050	50	311.5	9040	9.3															
750GH-063	63	424.0	10550	11.1															
750GH-075	75	553.8	12050	15.7															
750GH-080	80	553.8	12050	18.0															
750GH-100	100	865.3	15150	21.5															
750GH-125	125	1695.9	21360	21.5	98	78	50	32 max	25	14	9	26	3	20		100			Holder HT7723 Cover HCT7723 Isolation board HP7723 *2
750GH-160	160	2803.5	27470	29.5															
750GH-200	200	4188.0	37840	44															
750GH-250	250	7787.5	88000	48.7	108	82 ±4	51	41 max	31	16	10.5	34		25		180	cULus		
750GH-315	315	9422.9	97700	102.6															
750GH-350	350	16752.5	176060	79.5	107	81.5 ±3	51	46 max	37	13 ±0.7	11 ±0.7	40		30		260			
750GH-400	400	19936.5	204980	101.5															
750GH-450	450	31150.5	333490	103								43	6		90 max	520		2	
750GH-500	500	44856.5	436840	106															
750GH-630	630	67007.5	630210	137.5															
750GH-710	710	79744.5	745910	160															

*1 Continuous energizing current:75A.
*2 Continuous energizing current:100A.

Dimensions

Fig 1

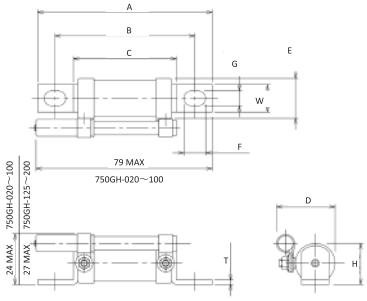
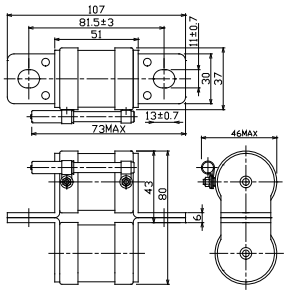
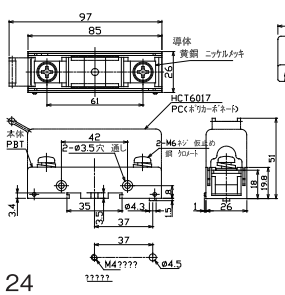


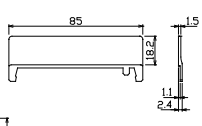
Fig 2



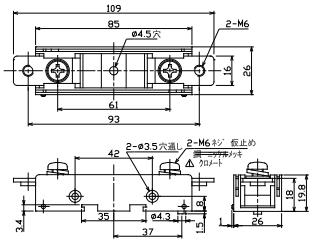
HT6017+HCT6017



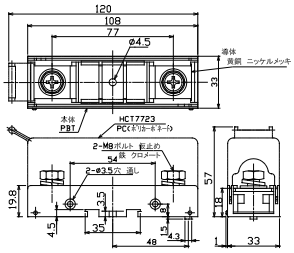
HP60



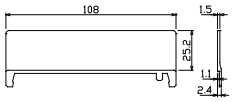
HT6017T2



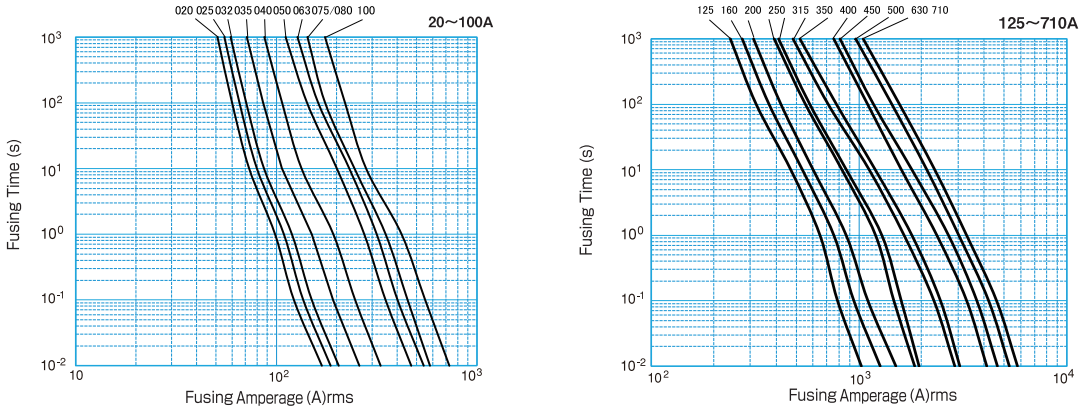
HT7723+HCT7723



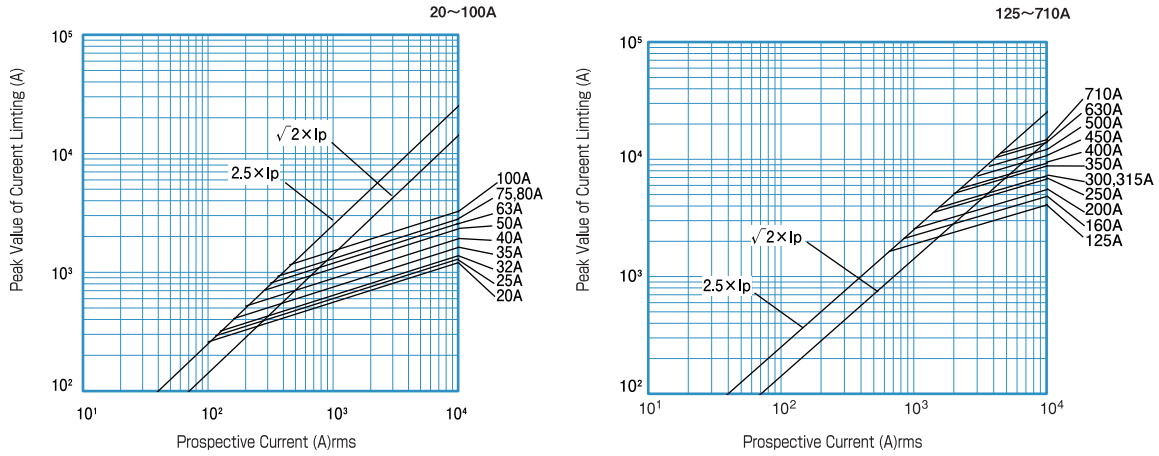
HP7723



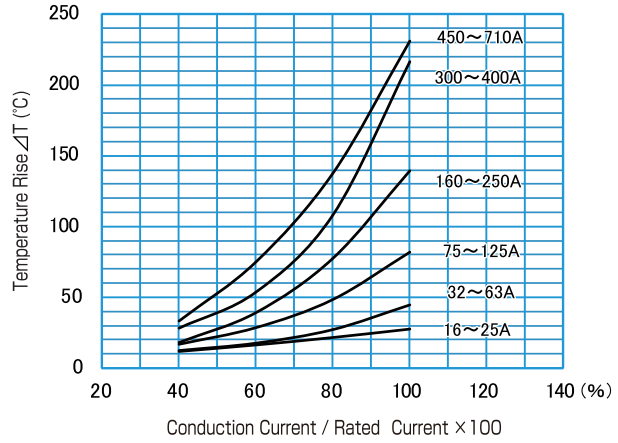
Fusing Characteristics



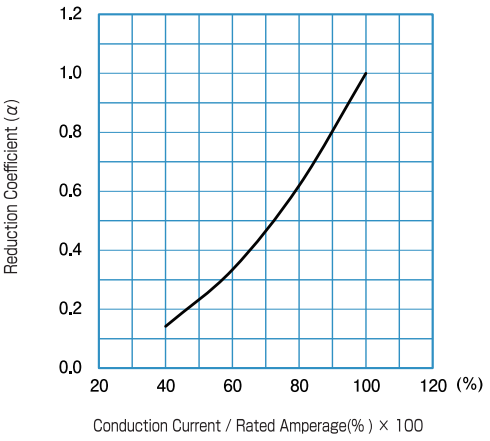
Current-Limiting Characteristics



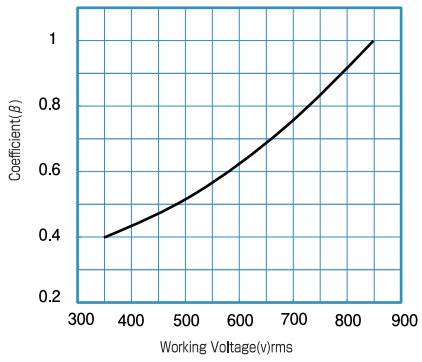
Temperature Rise



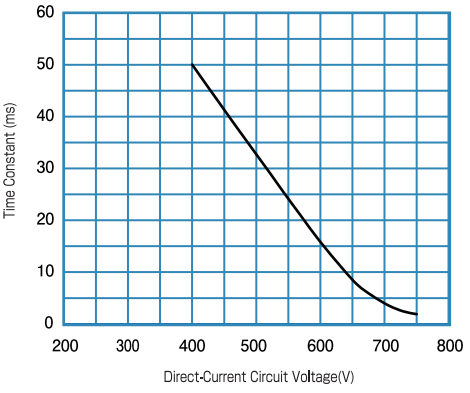
Power Loss



Shutdown I²T Against Working AC Voltage



Application to Direct-Current Circuit



1000VGH

FEATURES

- Compact series added to 1000V fuses lineup. Contributing to space saving.
- volume ratio Series maximum:77% downsizing(100A) *Series average:30% downsizing realized
- Recognized by UL(No.E143197)
- It is available to attach an alarm indicating fuse (micro switch can be installed).*

RATING

Rated voltage and blocking capacity : AC1000V-100kA
DC1000V(L/R=0.5ms)【16~100A】
(L/R=1.0ms)【125~350A】
(L/R=1.5ms)【400~500A】

Minimum block-off current : AC1000V / DC1000V- 8 times the rated current

Maximum arc voltage : 2100V

CAUTION!

- Read "PROTECT FUSE USER' S GUIDE" and "FOR SAFE USE" at the back of this catalog before use.
- When purchasing a product with an Alarm indicating Fuse, enter "S" immediately after the ampere rating in the product name (e.g. 1000VGH016S)
- The minimum working voltage of the alarm fuse is 10V.

UL standard approved rating

Rated voltage and blocking capacity: Same as the standard rating

CCC standared approved rating

When applying the standard to CCC standard approved items, use the fuse in the following rating.

AC1000V-50kA / DC800V-50kA (L/R=10ms)

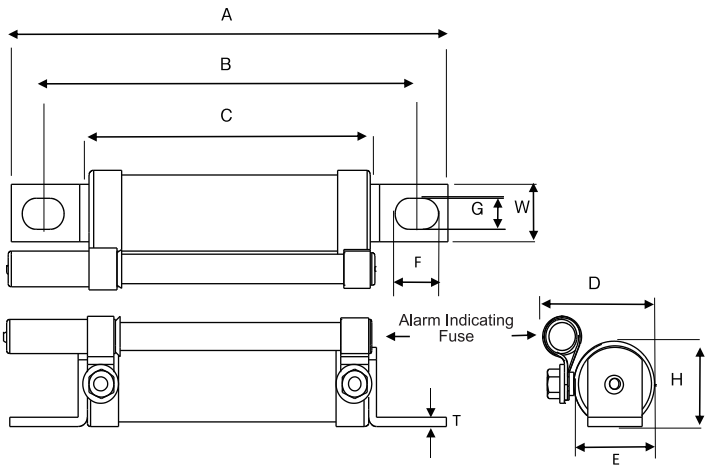
Specifications

Ta=25℃

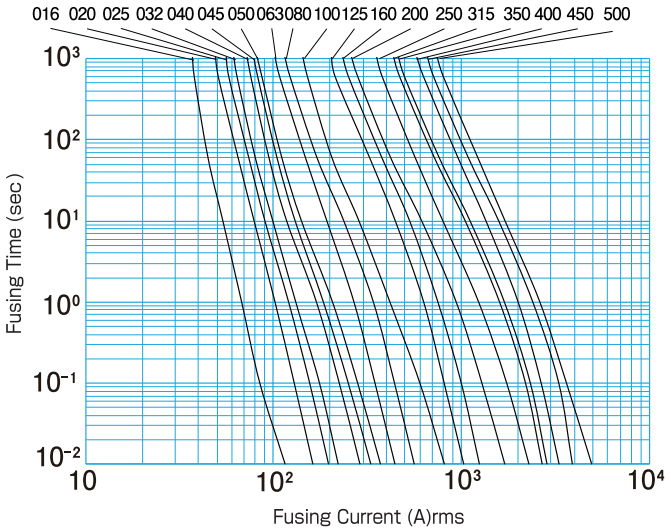
Type	Rated Amperage (A)	Fusing I²T (A²S)	Shutdown I²T(A²S) atAC850V-10kA	Power Loss (W)	Dimensions(mm)										Weight(g) ():with alarm	Standard Approved
					A	B	C	D*	E	F	G	H	W	T		
1000VGH016	16	19	480	4.1	97	83	66	24	17.8	9.5	6.5	18	12	2	51 (66)	
1000VGH020	20	34	770	4.7												
1000VGH025	25	54	1080	6.2												
1000VGH032	32	77	1420	9.5												
1000VGH040	40	138	2190	12												
1000VGH050	50	238	3320	15												
1000VGH063	63	311	4100	20												
1000VGH080	80	553	6590	29												
1000VGH100	100	1050	12000	34												
1000VGH125	125	1700	16200	36	117	97	69	32	24	14	9	26	20	3	115 (130)	
1000VGH160	160	2800	26700	52												
1000VGH200	200	4980	47400	73												
1000VGH250	250	8590	81600	84	126	99	69	40	31	16	10.5	35	25	3	200(215)	
1000VGH315	315	15300	146000	110	127	101	70	46	37	13	11	40	30	3	290(305)	
1000VGH350	350	16800	160000	146												
1000VGH400	400	19900	190000	143	132	100	72	53	45	15.5	11	48.5	32	4	445 (460)	
1000VGH450	450	34300	326000	147												
1000VGH500	500	44900	427000	155												

*: In the case of attached with alarm indicating fuse (1000VGH-***S)

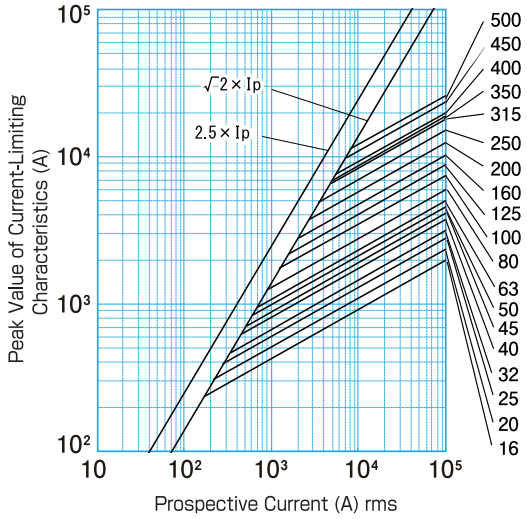
Dimensions



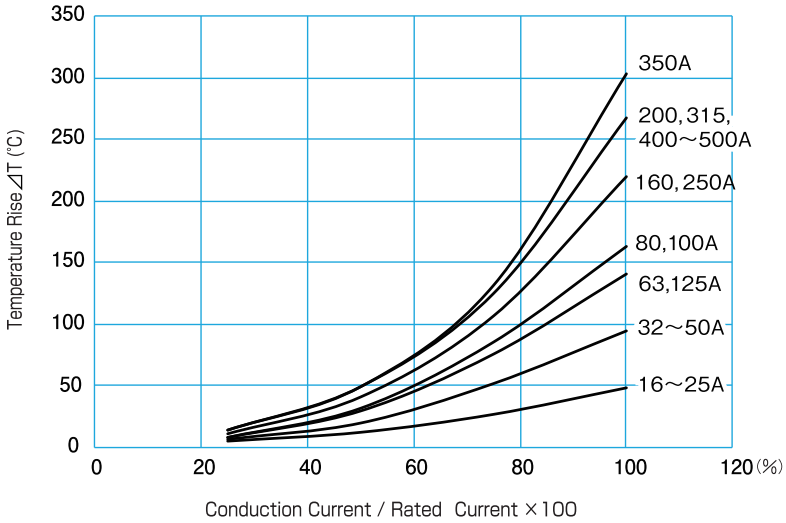
Fusing Characteristics



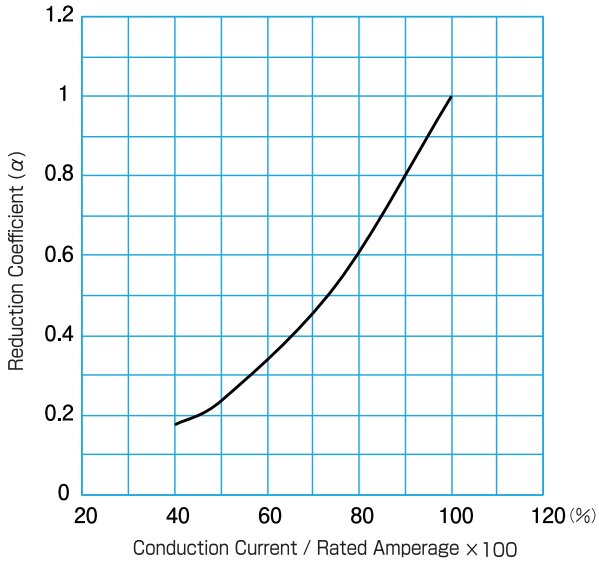
Current-Limiting Characteristics



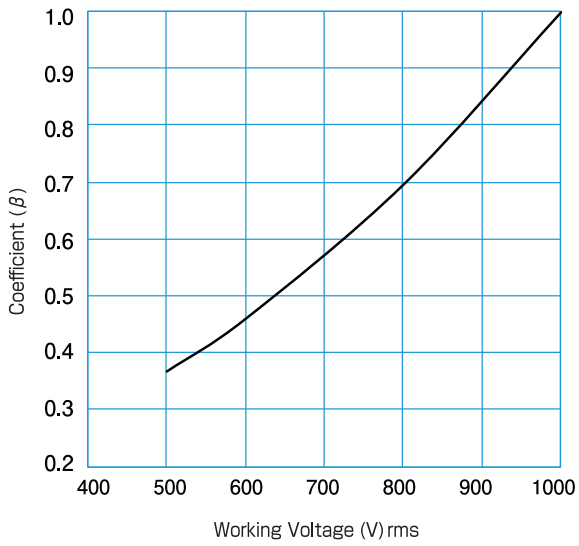
Temperature Rise



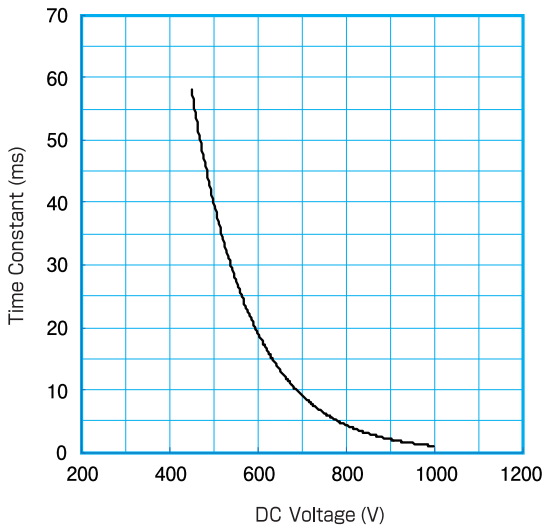
Power Loss



Shutdown I²t Against Working AC Voltage



Application to Direct-Current Circuit



1000GH

FEATURES

- It is available to attach an alarm indicating fuse (microswitch can be installed).
- Low-cost cylindrical fuse that is compliant to 1000V.
- It is also effective as a fuse with high blocking performance for systems operating at 400V.


1000GH-100


1000GH-400

RATING

Rated voltage and blocking capacity : 1000V AC-100KA
1000V DC (L/R = 3ms)-100KA
Minimum block-off current : 1000V AC/DC - 6 times the rated amperage
Maximum arc voltage : 2000V

CAUTION!

- Read "PROTECT FUSE USER' S GUIDE" and "FOR SAFE USE" at the back of this catalog before use.
- When purchasing a product with an Alarm indicating Fuse, enter "S" immediately after the ampere rating in the product name (e.g. 1000GH-100S).
- The minimum working voltage of the alarm fuse is 10 V.

UL standard approved rating

Rated voltage and blocking capacity: Same as the standard rating

*1 CCC standared approved rating

When applying the standard to CCC standard approved items, use the fuse in the following rating.

Rated voltage and blocking capacity:
AC1000V-50kA【16～630A】
DC800V-50kA(L/R10ms)【16～160A】
DC700V-50kA(L/R10ms)【200～630A】

Specifications

Ta=25℃

Type	Rated Amperage (A)	Fusing I²T (A²S)	Shutdown I²T(A²S) atAC850V-10kA	Power Loss (W)	Dimensions (mm) A	B	C	D	E	F	G	H	W	T	M	Weight (g)	Fig	Standard Approved
1000GH-016	16	20	340	4.2	95	82	66	28.5	20	8	6.5	22	14	2		66	1	
1000GH-020	20	30	590	4.5														
1000GH-025	25	50	1000	5.0														
1000GH-032	32	85	1330	9.7														
1000GH-040	40	145	1750	11.2														
1000GH-050	50	230	2990	12.0														
1000GH-063	63	330	3160	25.0														
1000GH-080	80	580	5600	28.0														
1000GH-100	100	1000	9470	30.0	126	99	69	40	31	16	10.5	35	25	3		196		
1000GH-125	125	1650	15650	42.0														
1000GH-160	160	2500	23400	65.0														
1000GH-200	200	4000	37520	75.0	127	101	70	46	37	13	11	40	30	3		290		
1000GH-250	250	6600	62010	110.6														
1000GH-315	315	10000	92760	120.0														
1000GH-400	400	16000	150060	155.0								43		6	83 Max		2	
1000GH-500	500	26400	250000	246.4														
1000GH-630	630	39500	370540	464.5														

Dimensions

Fig 1

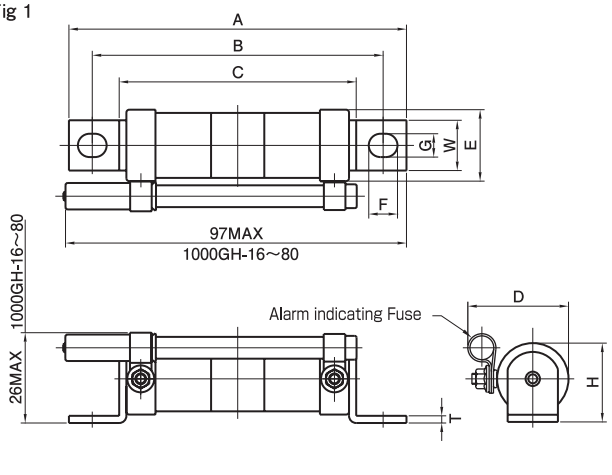
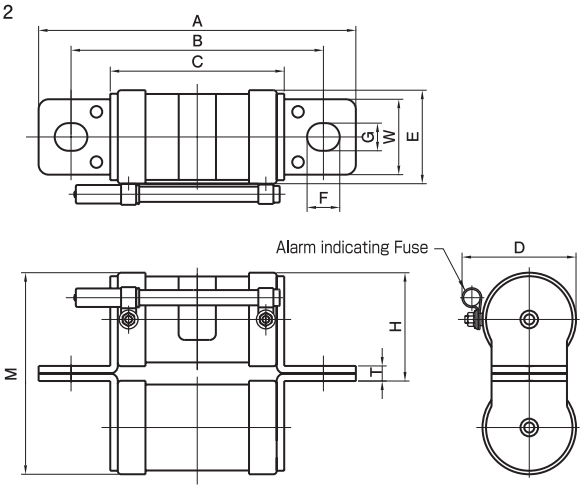
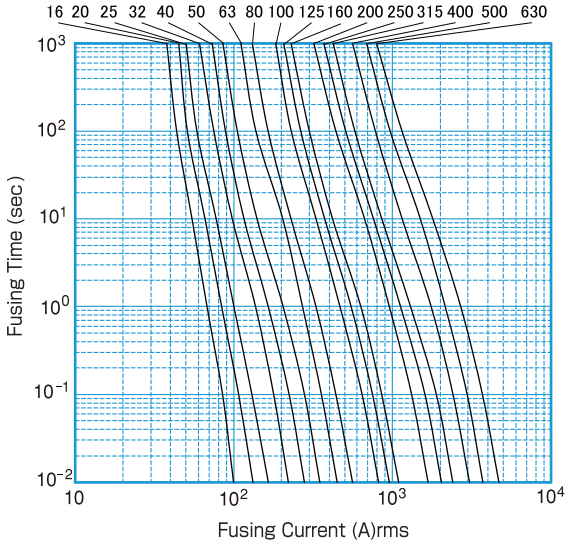


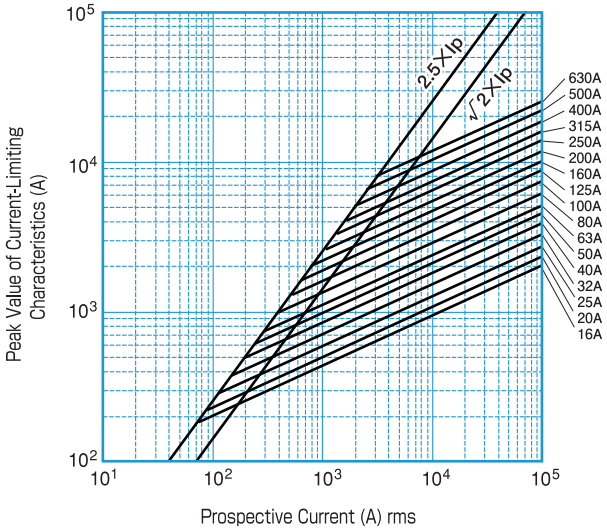
Fig 2



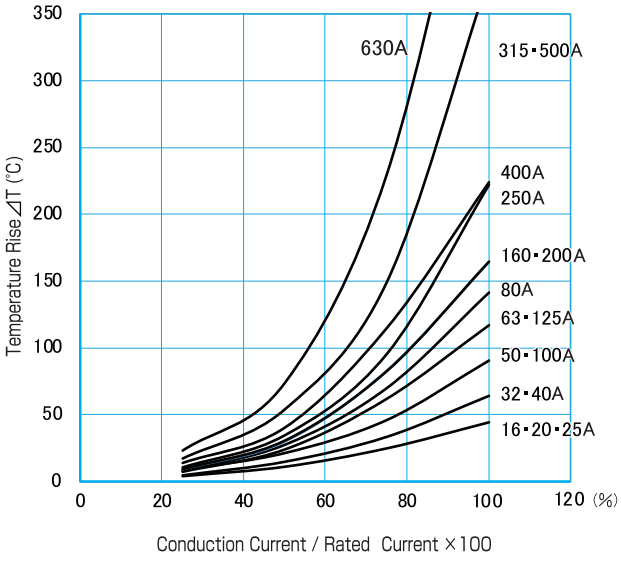
Fusing Characteristics



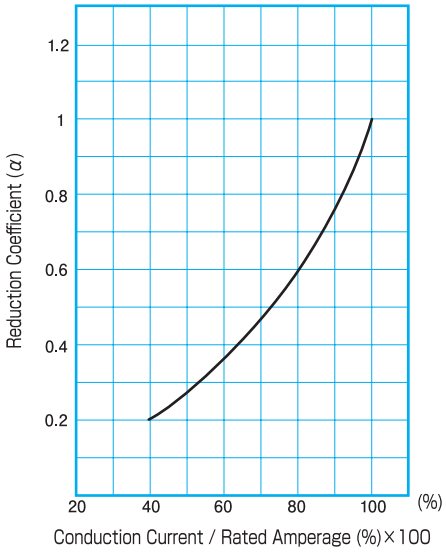
Current-Limiting Characteristics



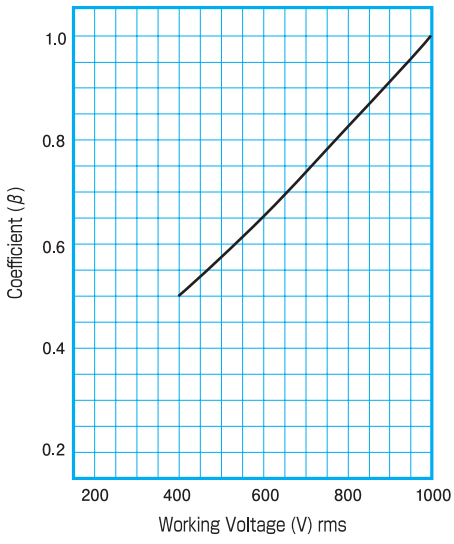
Temperature Rise



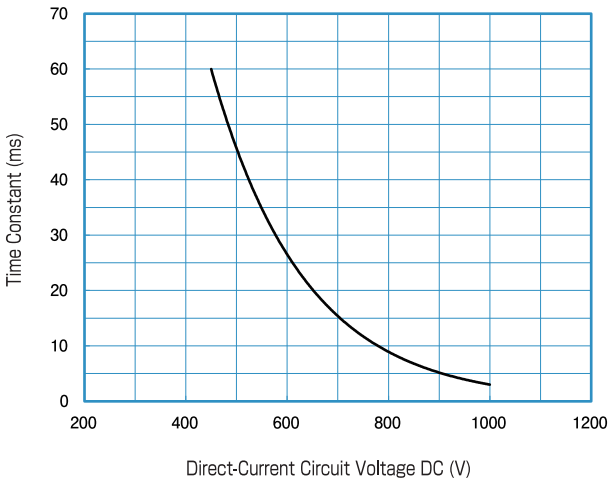
Power Loss



Shutdown I²t Against Working AC Voltage



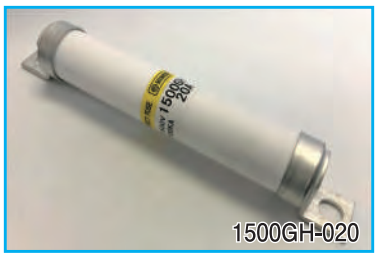
Application to Direct-Current Circuit



1500GH

FEATURES

- Low-cost, slim tubular fuses for 1500V.
- Ideal for energy storage systems and high voltage controls panels equipment requiring high voltages.
- It is available to attach an alarm indicating fuse (micro switch can be installed).*



RATING

Rated voltage and blocking capacity : 1500V-100kA / DC1500V (L/R=2ms)-100kA
Minimum block-off current : AC1500V/AC1500V-8times the rated current.
Maximum arc voltage : 4000V

CCC standard approved rating

- When applying the standard to CCC standard approved items, use the fuse in the following rating.
  AC1500V - 50kA / DC1200V (L/R=10ms) - 50kA

UL standard approved rating

Rated voltage and blocking capacity : same as the standard rating

CAUTION!

- Read "PROTECT FUSE USER' S GUIDE" and "FOR SAFE USE" at the back of this catalog before use.
- When purchasing a product with an Alarm Indicating Fuse, enter "S" immediately after the amprere rating in the product name (e.g.1500GH-016S).
- The minimum working voltage of the fusing indication function is 10V.

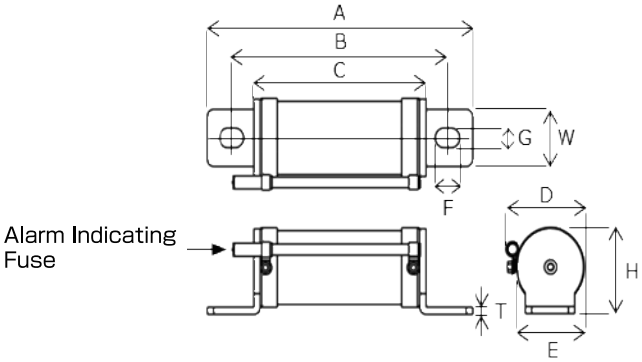
Specifications

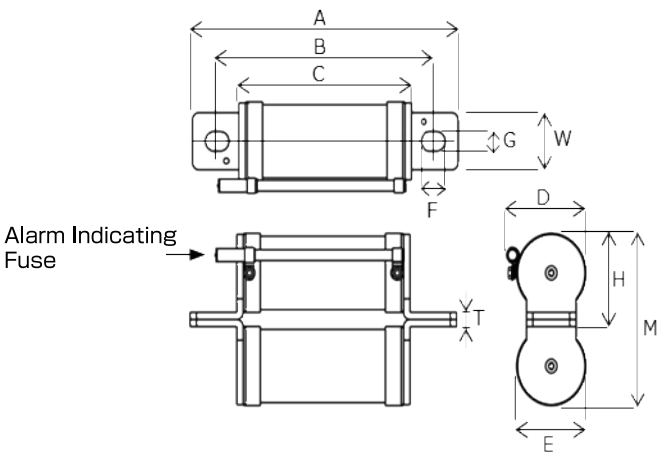
Ta=25℃

Type	Rated Amperage (A)	Fusing I^2t ($\times10^3A^2S$)	Shutdown I^2t ($\times10^3A^2S$) at AC600V 100KA	Power Loss (W)	Dimensions (mm) A	B	C	D*	E	F	G	H	W	T	M	Weight (g)	Fig	Standard Approved
1500GH-016	16	35	810	5.6	135	122	107	27	20	8	6.5	22	14	2	-	95	1	
1500GH-020	20	55	950	8.1														
1500GH-025	25	80	1140	10														
1500GH-032	32	140	1650	14														
1500GH-040	40	240	2520	15														
1500GH-050	50	320	3180	24														
1500GH-063	63	560	5400	31														
1500GH-080	80	956	9100	42														
1500GH-100	100	1700	16200	43	157	137	109	32	24	14	9	25.5	20	3		160		
1500GH-125	125	2810	26700	54														
1500GH-160	160	5000	47500	68	167	141	110	46	37	13	11	41	30	3		390		
1500GH-200	200	8700	82700	96														
1500GH-250	250	15300	146000	113														
1500GH-315	315	25300	241000	142	172	141	112	54	45	15.5	11	48	32	4		580		
1500GH-350	350	34400	327000	149														
1500GH-400	400	44800	425600	157														
1500GH-510	510	79700	757100	175	172	141	112	54	45	15.5	11	52	32	8	96	1160	2	
1500GH-630	630	137000	1301500	213														
1500GH-720	720	179400	1704300	243														

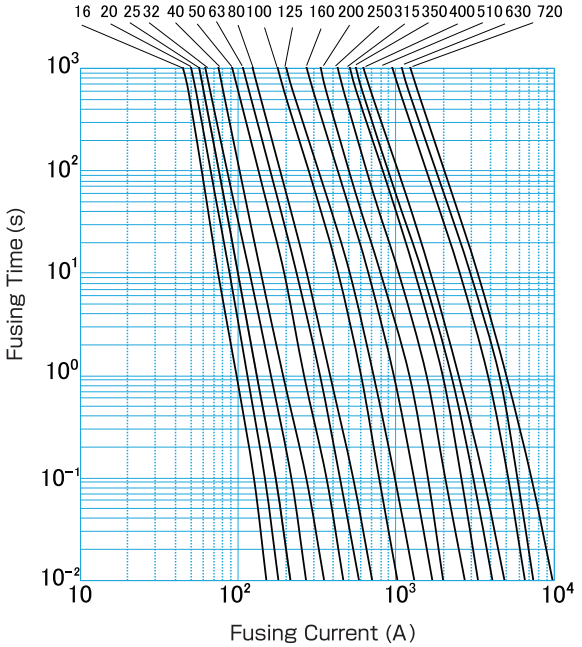
* : In the case of attached with alarm indicating fuse (1500GH-***S)

Dimensions

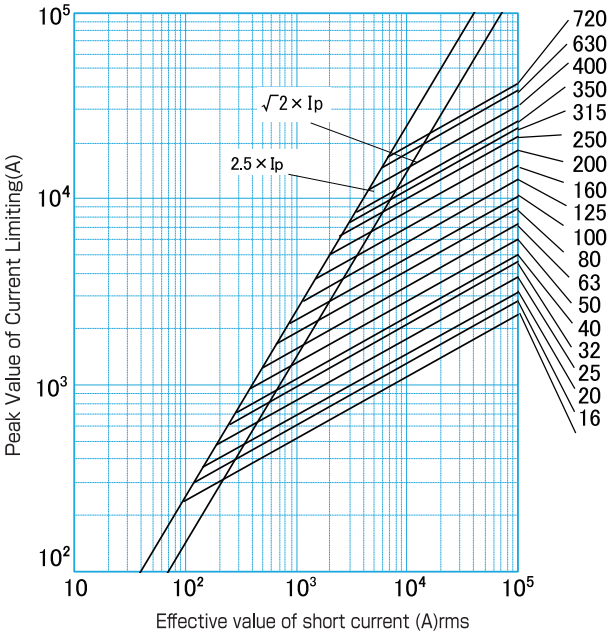




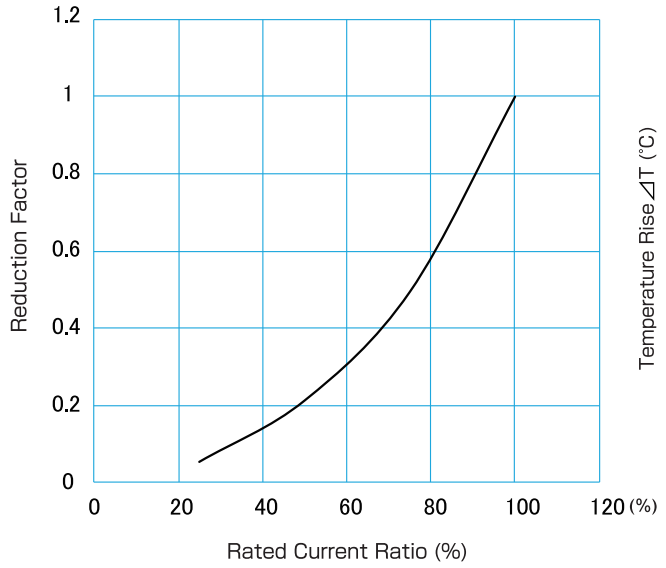
Fusing Characteristics



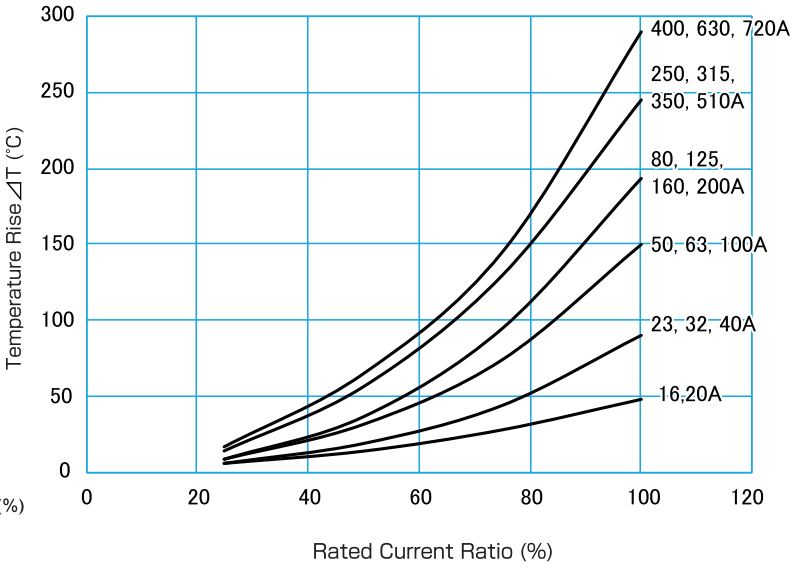
Current-Limiting Characteristics



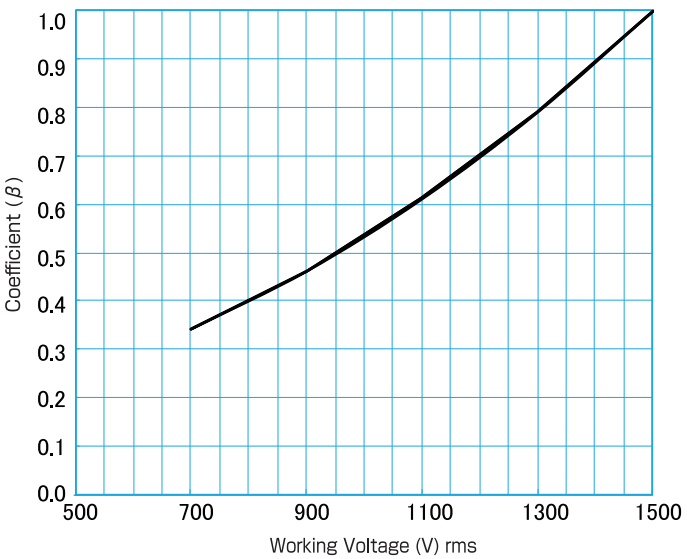
Power Loss



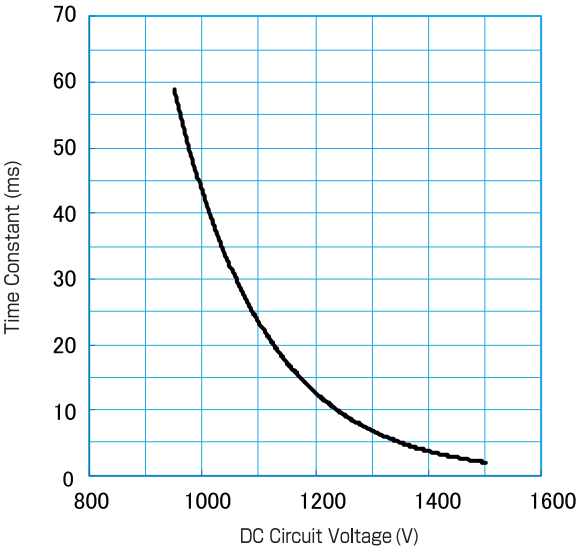
Temperature Rise



Shutdown I²t Against Working AC Voltage



Application to Direct-Current Circuit

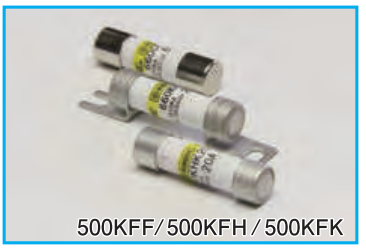


500KFF/500KFH/500KFK LOW-HEAT,COMPACT,FAST-ACTING FUSES

FEATURES

- LOW-HEAT, COMPACT, FAST-ACTING FUSES
- Suitable for built-in quick charger connectors, etc,or including protective coordination with cable short-circuit withstand capacity.
- Also suitable for requirement which needs low heat.
- Cylinder size ϕ10X38 mm, 35A current flow ΔT50°C or less has been achieved (*).
- It is available to use both AC/DC
- Three types are available according to the type of assembly: Holder (HK1038 mountable) type, Screw-mounted type and Board-mounted type.

*Ambient temperature:25℃


500KFF/500KFH/500KFK

CAUTION!

- *500KFK50 should be used 50% or less its rated current.

RATING

Rated voltage and breaking capacity:
AC/DC500V-30kA / DC500V-30kA(L/R=0.4ms)

Minimum block-off current: 2000A

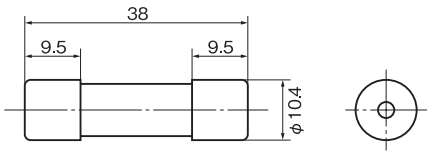
Specifications

Type	Rated Amperage (A)	Fusing I^2t (A^2S)	Shutdown I^2t (A^2S) at DC500V-30kA	Temperature Rise	Power loss	Weight (g)	Standard Approved
500KFF50	50(*)	2860	9700	ΔT50℃ or less *35A curernting	5.4W	10.2	-
500KFH50					5.4W	12.5	
500KFK50					5.8W	10.5	

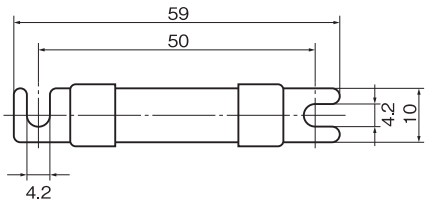
Opsions for 500KFF50
Compatible Holder : HK1038・HK1038UL
Holder Cover : HC-10
Fuse Clips : C-10CF

Dimensions

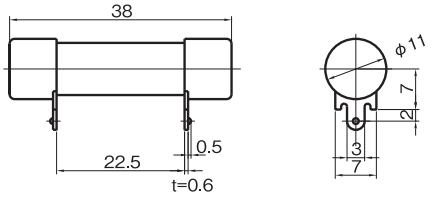
500KFF



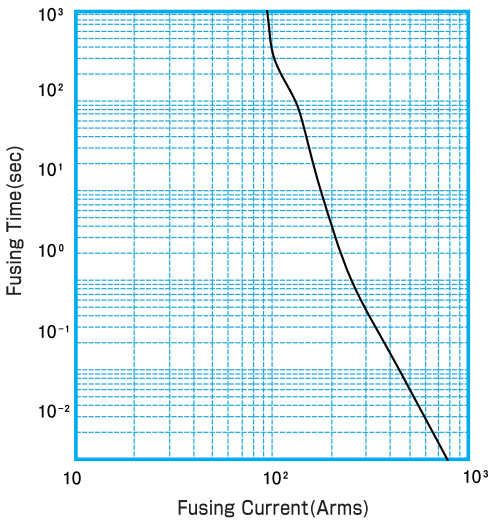
500KFH



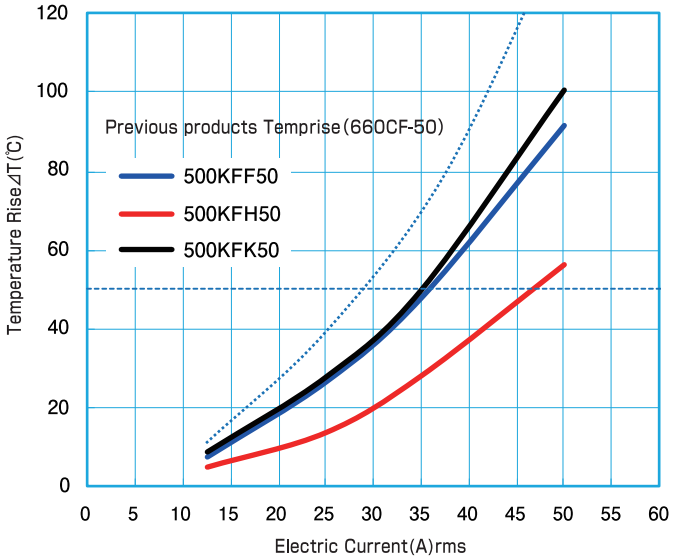
500KFK



FUSING CHARACTERISTICS



TEMPERATURE RISE



Other products and Past products

We are not to be accepted a new estimate (for maintenance is exclude).
Please use present model on catalog.
if you cannnot find product which you need. It might have changed the product name.
Please check P42 or confirm on our website.
▷https://www.hinodedenki.co.jp/en/info/#info03

▲Scan the QR code

We have some of our products which have the same product name but different product name notation (old product name).
These products are merged in the list of below.
Please check the detail of change the product name on our website.
▷ https://www.hinodedenki.co.jp/en/images/pdf/211011.pdf
▷ https://www.hinodedenki.co.jp/en/images/pdf/compare202203.pdf

Old Products name	Present Products name
25PX□□U	250SF-□□
250CF-□□	
35SF-□□	500SF-□□
50PX□□	
350KH-□□	400KH-□□
250KH-□□	
25LG□□U	
350KHK□□	400KHK□□
500CF-□□	660CF-□□
600CF-□□	
60PFF-□□U	
600KH-□□	660KH-□□
66LG□□U	
70PFF□□	700CF-□□
F70C-□□	
700CF-(5-30)	800CF-□□
F70C-□□	
70PFF□□U	
250FH-20	250GH-020
250FH-20UL	
250GH-20	
250FH-35	250GH-032
250FH-35UL	
250GH-32	
25SHA40	250GH-040
250FH-40	
250FH-40UL	
250GH-40	
25SHA50	250GH-050
250FH-50	
250FH-50UL	
250GH-50	
25SHA60	250GH-063
250FH-60	
250FH-60UL	
250GH-63	
250GH-60	
250GA-60	
250GH-160	250GH-160
250GH-150	

Old Products name	Present Products name
660GHS30	660GH-032
660GHS35	660GH-035
660GHS40	660GH-040
660GHS50	660GH-050
660GHS80	660GH-080
660GHS100	660GH-110
660GH-150	660GH-160
660GHS160	
660GHS150	
250GF-□□(S)	25FH□□(S)
25SH□□(S)	250GG-□□(S)*
25SHA□□(S)	250GA-□□(S)*
50SHA□□(S)	500GA-□□(S)*
50SHB□□(S)	500GB-□□(S)*
250FH-75(S)～150(S)	250FH-075～150
250GA-75(S)～150(S)	
25SHA75(S)～150(S)	

* Discontinued Products

OPTIONS FUSE-holdes Fuse-clips

FUSE HOLDERS

◆ For Cylindrical Fuses


HK0631+HC06


HK1038(UL)+HC-10

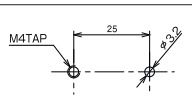
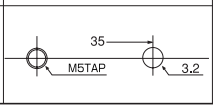
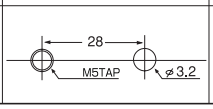
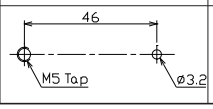
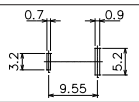
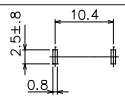

HK1551+HC-15


HK1567+HC1567


C06-SF

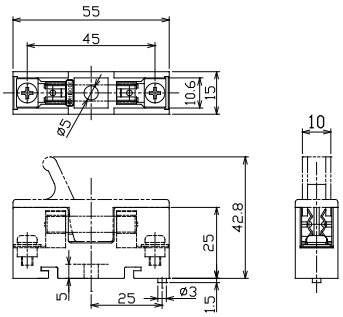

C10-CF

Specifications

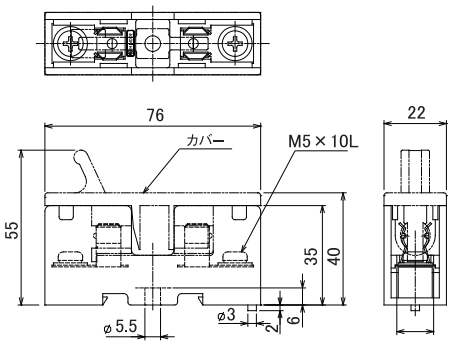
	HK0631	HK1038/HK1038UL	HK1551	HK1567	C-06SF	C-10CF
Rated Voltage	500V	700V	800V	**1000V**	500V	700V
Rated Amperage*1	15A	30A	40A	**30A**	15A	30A
Applicable Wires	Up to 5.5㎟(M4)	Up to 8㎟(M5)	Up to 14㎟(M5)	Up to 14㎟(M5)	——	——
Installation	DIN rails and direct installation					
Applicable fuses	φ6.4×31㎜ (Series 250SF/500SF*2)	JIS MF01(φ10.3×38㎜ (Series 660CF*2)	JIS CF2(φ15×51㎜) (Series 700CF/800CF*2)	φ15×67㎜ (Series 1000CF*2)	Board Soldered*2 (Series 250/500SF)	(Series 660CF)
Material	PBT(body)				Phosphor bronze Tin plating	Phosphor bronze Tin plating
Name of Approved product		HK1038UL			——	——
Options	Holder cover HC06	Holder cover HC-10	Holder cover HC-15	Holder cover HC1567	——	——
Installing Hole Size						

Dimensions

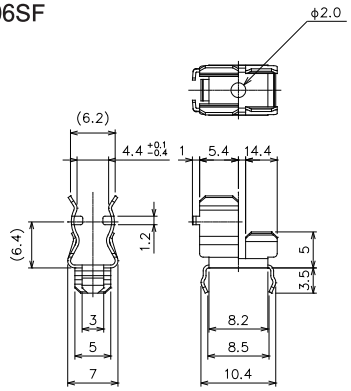
HK0631+HC06



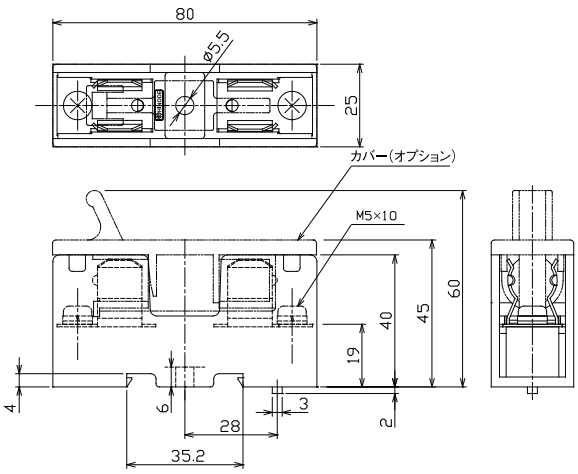
HK1038/HK1038UL+HC-10



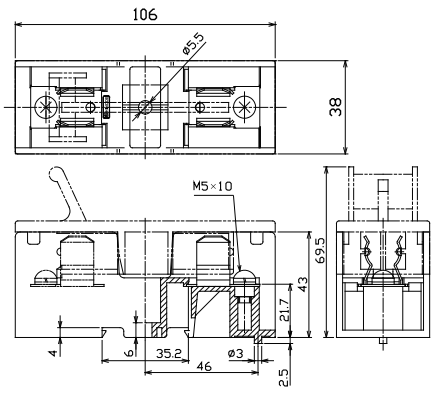
C-06SF



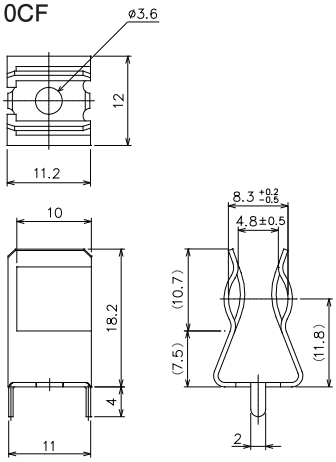
HK1551+HC-15



HK1567+HC1567



C-10CF



*1 Available to leave continuously turns on for long durations.
*2 2 Use at voltage and current values lower than rated of fuse holders.

FUSE HOLDERS

◆ For Screwed Fuses


HT4017+HCT4017


HT4017T2

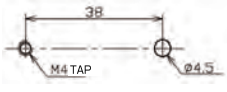
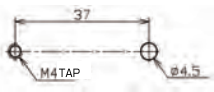
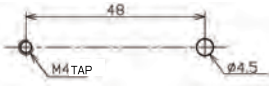

HT5723+HCT5723


HT6017T2+HCT6017


HT6017T2

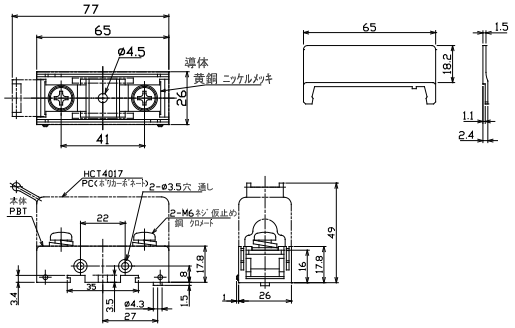

HT7723+HCT7723

Specifications

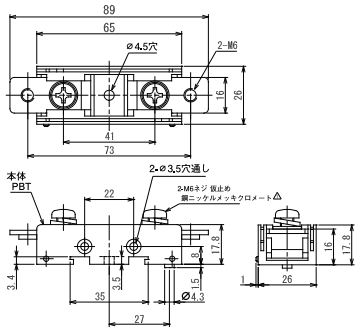
	HT4017/4017T2	HT5723	HT6017/6017T2	HT7723
Rated Voltage	400V	400V	750V(6017T2:660V)	800V
Rated Amperage *1	75A	100A	75A	100A
Applicable Wires	Up to 22㎟(M6)	Up to 38㎟(M8)	Up to 22㎟(M6)	Up to 38㎟(M8)
Instllation	DIN rails and direct installation			
Applicable Fuses	250GH-020～125 *2 350GH-016～100 *2	350GH 125-200 *2 250GH 160-250 *2	660GH-016～100 *2 750GH-020～100 *2	660GH 125-200 *2 750GH 125-200 *2
Material	PBT(body)			
Name of Approved product	—			
Options	Holder cover HCT4017 Isolation board HP40	Holder cover HCT5723 Isolation board HP5723	Holder cover HCT6017 Isolation board HP60	Holder cover HCT7723 Isolation board HP7723
Installing Hole Size				

Dimensions

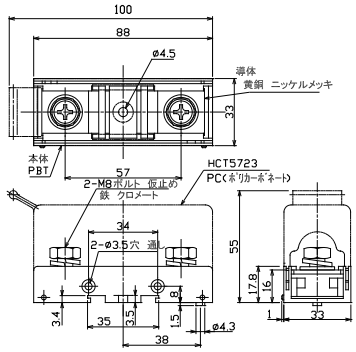
HT4017+HCT4017　HP40



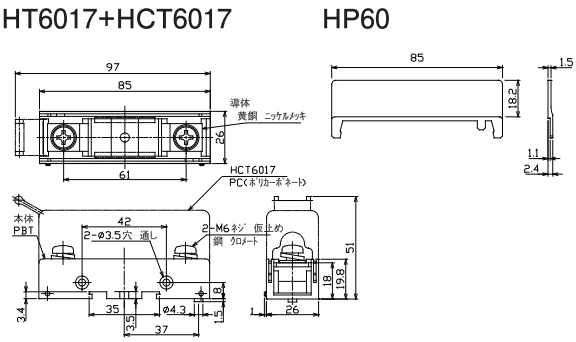
HT4017T2



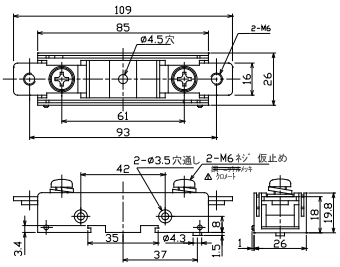
HT5723+HCT5723



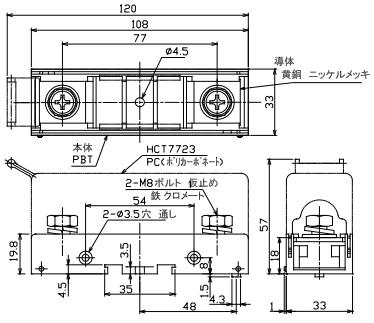
HT6017+HCT6017　HP60



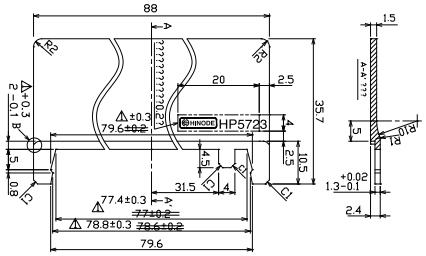
HT6017T2



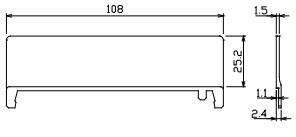
HT7723+HCT7723



HP5723



HP7723



*1 Available to leave continuously turns on for long durations.
*2 Use at voltage and current values lower than rated of fuse holders.

HTM06 / HTM08

FEATURES

- Supports 1000V rated voltage
- Suitable for generic applications
  Can be used with 250V, 660V, 1000V and various other fuses


HTM06


HTM08

Specifications

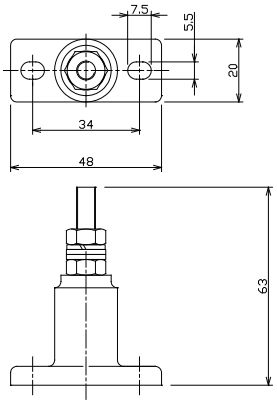
	HTM06	HTM08
Rated Voltage	1000V	1000V
Rated Amperage*1	60A	100A
Applicable Wires	Up to 22mm²(M6)	Up to 38mm²(M8)
Installation	Direct installation	Direct installation
Insulation Resistance	2000MΩ or higher	2000MΩ or higher
Withstand voltage	AC3000V 50-60Hz 1 minute	AC3000V 50-60Hz 1 minute
Material	PBT	PBT

*1 Current at which continuous current flow is possible.

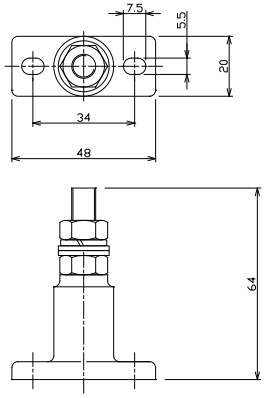
*2 The sizes for each series are given. In the event of using a fuse with a rated current in excess of 60A(HTM06) or 100A(HTM08), please do not use with a continuous current flow in excess of 60A(HTM06) or 100A(HTM08).

Dimensions

HTM06



HTM08



Applicable fuses HTM06

Type	Rated Voltage	Rated Amperage*2 up to**	Remarks
250GH	250V	125A	
250FH	250V	60A	※A
25FH	250V	75A	
25SHA	250V	150A	※A
250GA	250V	150A	※B
25LKA	250V	100A	
350GH	350V	100A	
50SHA	500V	80A	※A・※B
500GA	500V	80A	
660GH	660V	100A	
66LKA	660V	100A	
660HTP	660V	100A	
750GH	750V	100A	
1000GH	1000V	80A	

HTM08

Type	Rated Voltage	Rated Amperage*2 up to**	Remarks
250GH	250V	160A～250A	
25SH	250V	75A～150A	※A・※B
350GH	350V	125A～200A	
660GH	660V	125A～200A	
66LKB	660V	100A～200A	
660HTP	660V	125A～200A	
750GH	750V	125A～200A	
48LFB	48V	all	
96LFB	96V	all	

Remarks

※A merged name products (See the new model after integration.)

※B Discontinued Products

Compatibility table of fuse and fuse holders

How to check ● Applicable □ Not applicable – No product

Type	HK0631		options	Product	Type
V / A	500V/15A(※)			Holder Cover	HC06

Rated Amperage	4	6	10	16	20	25
250SF	●	●	●	●	-	●
500SF	●	●	●	●	●	

※ Continuous energizing current:up to 15A.

Type	HK1038/HK1038UL		options	Product	Type
V / A	700V/30A(※)			Holder Cover	HC-10

Rated Amperage	5	10	15	20	25	30	35	40	50	60
660CF	●	●	●	●	●	●	●	●	●	●

※ Continuous energizing current:up to 30A.

Type	HK1551		options	Product	Type
V / A	800V/40A			Holder Cover	HC-15

Rated Amperage	5	10	15	20	25	30	35	40	50	60
700CF	-	-	-	-	-	-	●	●		
800CF	●	●	●	●	●	●	-	-		

※ Continuous energizing current:up to 40A.

Type	HK1567		options	Product	Type
V / A	1000V/30A			Holder Cover	HC1567

Rated Amperage	5	10	15	20	30	35
1000CF	●	●	●	●	●	●

※ Continuous energizing current:up to 30A.

Type	HT4017/HT4017T2		options	Product	Holder Cover	Isolation board
V / A	400V/75A(※)			Type	HCT4017	HP40 (available to set both side)

Rated Amperage	16	20	25	30	32	35	40	45	50	55	60	63	70	75	80	85	100	110	125	140	150	160	175	180	200	250	315	350	400	450
250GH	-	●	●	-	●	●	●	-	●	-	-	●	-	●	●	●	●	-	●											
350GH	●	●	●	-	●	-	●	-	●	-	-	●	-	-	●	-	●													
250FH	-	●	●	●	●	●	-	●	●	●	-	-	-	-	-	-	-													
25FH	-	-	●	-	-	●	-	-	●	-	-	-	-	●	-	-	●													
250GA	-	●	●	●	-	●	-	●	-	●	-	-	●	-	-	●	-													
25LKA	-	●	-	●	-	-	●	-	●	-	●	-	-	●	-		●													

※ Continuous energizing current:up to 75A.

Type	HT5723		options	Product	Type	Isolation board
V / A	400V/100A(※)			Holder Cover	HCT5723	HP5723(available to set both side)

Rated Amperage	16	20	25	30	32	35	40	45	50	55	60	63	70	75	80	85	100	110	125	140	150	160	175	180	200	250	315	350	400	450
250GH	-			-			-		-	-		-					-		-	-	●		-	●	●					
350GH				-		-	-		-	-		-	-		-		-	●	-	-	●		-	●						
250GG	-	-	-	-	-	-	-		-		-	-	●	-	●	●	●	●	●	●										

※ Continuous energizing current:up to 100A.

Type	HT6017/HT6017T2		options	Product	Type	Isolation board
V / A	750V/75A(※)			Holder Cover	HCT6017	HP60(available to set both side)

Rated Amperage	16	20	25	30	32	35	40	45	50	55	60	63	70	75	80	85	100	110	125	140	150	160	175	180	200	250	315	350	400	450
660GH	●	●	●	-	●	-	●	-	●	-	-	●	-	-	●	-	●			-	-		-	-						
750GH	-	●	●	-	●	●	●	-	●	-	-	●	-	●	●		●	-		-	-		-	-				-	-	-
600FH/FHS	-	●	●	●	-	●	●	●	●	●	-																			
600FHM	-	●	-	●	-	●	-	-	-	●																				
66LKA	-	●	-	●	-	-	●	-	●	-	●	-	-	●																

※ Continuous energizing current:up to 75A.

Type	HT7723		options	Product	Type	Isolation board
V / A	800V/100A(※)			Holder Cover	HCT7723	HP7723(available to set both side)

Rated Amperage	16	20	25	30	32	35	40	45	50	55	60	63	70	75	80	85	100	110	125	140	150	160	175	180	200	250	315	350	400	450
660GH																		●	-	-	●		-	●						
750GH																		●	-	-	●		-	●						
66LKB																	-	●	-	●	-	●	-	●						

※ Continuous energizing current:up to 100A.

* See the page 36-37 the detail of fuse holders and options.
* Current value is continuous energizing current.
* Use within range rated current and voltage of fuse holders.
* Products in italics are old type. Please contact us if you need more information.

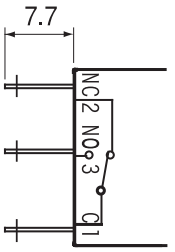
MICROSWITCHES

AMS-3B/3BT/01B

AMS-7B/7B01

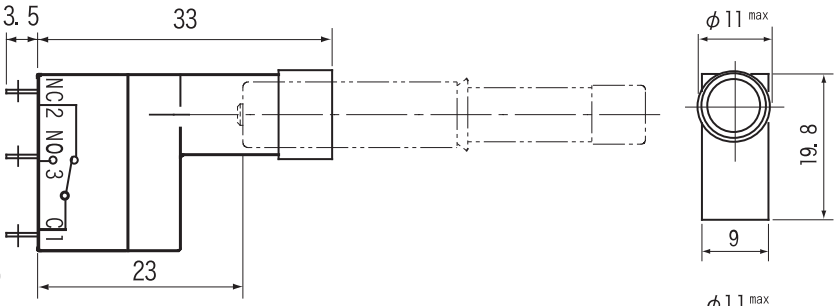
Specifications / Dimensions For Series "GH"

AMS-3BT

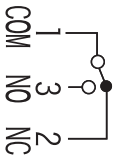


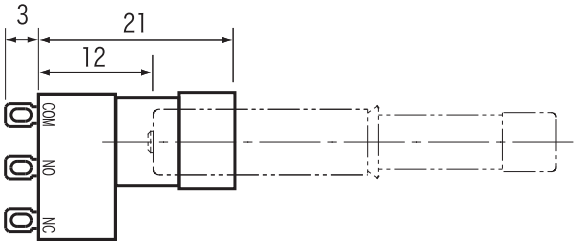
Tab Terminal (#110)

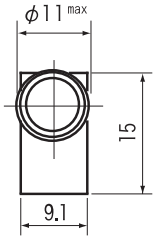
AMS-3B/01B



AMS-7B/7B01







● Specifications

Model	Rated Voltage (V)	Resistive Load (A)	Switch Model
AMS-3B Standard Model	AC125	5A	Omron SS-5GL
	AC250	3A	
AMS-3BT Tab Terminal	AC125	5A	Omron SS-5GLT
	AC250	3A	
AMS-01B Micro Current Model	AC125	0.1A	Omron SS-01GL
	DC30		
AMS-7B Standard Model	AC125	3A	Omron D2F-D3
	DC30	2A	
AMS-7B01 Micro current Model	DC30	0.1A	Omron D2F-01-03

* In the case of use standard micro switch by DC line, Please make sure check and motion evaluation by yourselves before it use.
* Micro-switches single unit specifications: Please contact omron corporation.

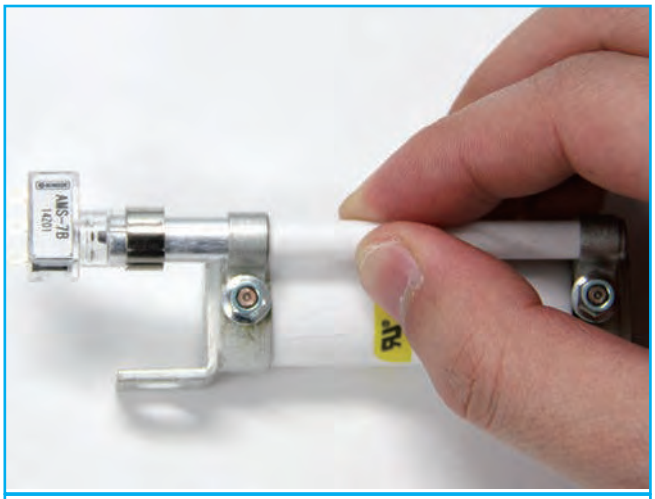
Instructions for Micro-switch installation

Before using, please read these instructions carefully and use the device in the appropriate manner.

Micro-switch : AMS series
Fuse with an indicator fuse : Products that have “S” after the rated amperage in the product number

1. Hold the indicator fuse firmly and put in the micro-switch

If the micro-switch is installed without holding the indicator fuse, this may cause the indicator band to bend and/or come out of the indicator fuse easily.



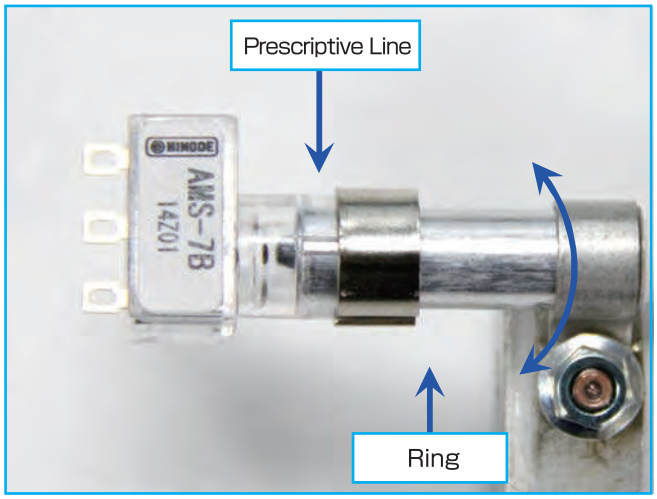
Hold the indicator fuse with your fingers firmly.

2. Twist lightly and install the micro-switch to the prescriptive location

If the micro-switch is installed forcibly and at an irregular angle, this may cause the indicator band to bend and/or come out of the indicator fuse easily.

If it is not installed in the prescribed location, the fusing stick may not be able to reach the switch.

* In order to prevent disconnection, a ring is attached to the connecting part of the micro-switch. Depending on the ring size, a little insertion force may be required.



Discontinued products and Scheduled to be discontinued

The following products have been discontinued or are planned to be discontinued. (as of Apr, 2023)
Please check our website for the latest information.
▷ https://www.hinodedenki.co.jp/info/#info03

Year of end of production guidance	Series
Before 2020	250FH-75M
	600GFS,660FHG-,660GHW-350～710,660GHW-175～325, 660GHW-350S～710S
	660GHW-175S～325S,660VFA,660HL-17
	700FHA, 700FHB ,660KH-**NJ
	FH-1, FH-2, FH-3, FHS-1, FHS-2, FHS-3
	25SF, 50CF
	FA-5, FA-15, FA-30, FA-5, FA-15
	FA-30, FA-60
	50SF, 70CF, 100CF
	GEF-, 800SPF
	1500FH, 2000FH
	800GH, 800KH-, F25C
	600TC-100, 250GHS
	600CFT
	70SRF
	1000FH(一部)
	F50P, F70P
	250HL-17
	70SHA/70SHB
	50FA/60FA
2021	500GL
	600SFK30JV2
2022	15,25,50KAR / 250,500GAR
	660HTP250、300
	600FH
	50,70SRF
	600,1000,1500SPF
	AMS-5VX/AMS-01VX
	1000FH
	F25P
	60CRF10
2023	25LKB260～350
	66LKB235～300
	600FHM

Table of UL certified products

UL File No.E143197
https://iq.ulprospector.com/info/
You need login UL Product iQ™ to check certified product.

Model			Rated Voltage and Blocking capacity*	Rated Amperage(A)
●500VSK/500VSHSeries				
500VSH10	500VSK10		AC450V-10kA DC450V(L/R1ms)-10kA	10
500VSH20	500VSK20			20
500VSH36	500VSK36			36
●250SF/250SFKSeries				
250SF-10	250SFK10		AC250V-10kA DC250V(L/R10ms)-10kA	10
250SF-16	250SFK16			16
●500SF/500SFKSeries				
500SF-10	500SFK10		AC500V-10kA DC500V(L/R2ms)-10kA	10
500SF-16	500SFK16			16
500SF-20	500SFK20			20
●400KH/400KHKSeries				
400KH-5	400KHK05		AC400V-10kA DC400V(L/R5ms)-10kA	5
400KH-10	400KHK10			10
400KH-15	400KHK15			15
400KH-20	400KHK20			20
400KH-25	400KHK25			25
400KH-30	400KHK30			30
400KH-35	400KHK35		AC400V-10kA DC360V(L/R2ms)-10kA	35
400KH-40	400KHK40			40
400KH-50	400KHK50			50
400KH-60	400KHK60			60
●660CF/660KH/660KHKSeries				
660CF-5	660KH-5	660KHK05	AC660V-10kA DC570V(L/R2ms)-10kA	5
660CF-10	660KH-10	660KHK10		10
660CF-15	660KH-15	660KHK15		15
660CF-20	660KH-20	660KHK20		20
660CF-25	660KH-25	660KHK25		25
660CF-30	660KH-30	660KHK30		30
660CF-35	660KH-35	660KHK35		35
660CF-40	660KH-40	660KHK40		40
660CF-50	660KH-50	660KHK50		50
660CF-60	660KH-60	660KHK60		60
●800CFSeries				
800CF-5			AC660V-10kA DC800V(L/R10ms)-10kA	5
800CF-10				10
800CF-15				15
800CF-20				20
800CF-25				25
800CF-30				30
●350GHSeries				
350GH-016	350GH-016S		AC380V-10kA DC400V(L/R2ms)-10kA	16
350GH-020	350GH-020S			20
350GH-025	350GH-025S			25
350GH-032	350GH-032S			32
350GH-040	350GH-040S			40
350GH-050	350GH-050S	350GHK050		50
350GH-063	350GH-063S			63
350GH-080	350GH-080S	350GHK080		80
350GH-100	350GH-100S	350GHK100		100
350GH-125	350GH-125S			125
350GH-160	350GH-160S			160
350GH-200	350GH-200S			200
350GH-250	350GH-250S			250
350GH-315	350GH-315S			315
250GH-350	250GH-350S		AC250V-100kA DC250V(L/R10ms)-100kA	350
250GH-400	250GH-400S			400
250GH-450	250GH-450S			450

* When applying the standard to UL standard approved items, use the fuse in the written rating.

Model			Rated Voltage and Blocking capacity*	Rated Amperage(A)
●660GHSeries				
660GH-016	660GH-016S		AC660V-100kA DC660V(L/R10ms)-100kA	16
660GH-020	660GH-020S			20
660GH-025	660GH-025S			25
660GH-032	660GH-032S			32
660GH-040	660GH-040S			40
660GH-050	660GH-050S			50
660GH-063	660GH-063S			63
660GH-080	660GH-080S			80
660GH-100	660GH-100S			100
660GH-125	660GH-125S			125
660GH-160	660GH-160S			160
660GH-200	660GH-200S			200
660GH-250	660GH-250S			250
660GH-315	660GH-315S			315
●750GH/750GHKSeries				
750GH-020	750GH-020S		AC850V-10kA	20
750GH-025	750GH-025S			25
750GH-032	750GH-032S			32
750GH-035	750GH-035S			35
750GH-040	750GH-040S			40
750GH-050	750GH-050S	750GHK050	AC850V-10kA DC750V(L/R2ms)-10kA	50
750GH-063	750GH-063S			63
750GH-075	750GH-075S			75
750GH-080	750GH-080S	750GHK080		80
750GH-100	750GH-100S	750GHK100		100
750GH-125	750GH-125S			125
750GH-160	750GH-160S			160
750GH-200	750GH-200S			200
750GH-250	750GH-250S			250
750GH-300	750GH-300S			300
750GH-315	750GH-315S			315
750GH-350	750GH-350S			350
750GH-400	750GH-400S			400
750GH-450	750GH-450S		AC850V-10kA	450
750GH-500	750GH-500S			500
750GH-630	750GH-630S		AC850V-10kA DC660V(L/R2ms)-10kA	630
750GH-710	750GH-710S			710
●1000GHSeries				
1000GH-016	1000GH-016S		AC1000V-100kA DC1000V(L/R3ms)-100kA	16
1000GH-020	1000GH-020S			20
1000GH-025	1000GH-025S			25
1000GH-032	1000GH-032S			32
1000GH-040	1000GH-040S			40
1000GH-050	1000GH-050S			50
1000GH-063	1000GH-063S			63
1000GH-080	1000GH-080S			80
1000GH-100	1000GH-100S			100
1000GH-125	1000GH-125S			125
1000GH-160	1000GH-160S			160
1000GH-200	1000GH-200S			200
1000GH-250	1000GH-250S			250
1000GH-315	1000GH-315S			315
1000GH-400	1000GH-400S			400
1000GH-500	1000GH-500S			500
1000GH-630	1000GH-630S			630

Model			Rated Voltage and Blocking capacity*	Rated Amperage(A)
●1000VGHSeries				
1000VGH016	1000VGH016S		AC1000V-100kA DC1000V-100kA L/R=0.5ms:【16-100A】 L/R=1.0ms:【125-350A】 L/R=1.5ms:【400-500A】	16
1000VGH020	1000VGH020S			20
1000VGH032	1000VGH032S			32
1000VGH040	1000VGH040S			40
1000VGH050	1000VGH050S			50
1000VGH063	1000VGH063S			63
1000VGH080	1000VGH080S			80
1000VGH100	1000VGH100S			100
1000VGH125	1000VGH125S			125
1000VGH160	1000VGH160S			160
1000VGH200	1000VGH200S			200
1000VGH250	1000VGH250S			250
1000VGH315	1000VGH315S			315
1000VGH350	1000VGH350S			350
1000VGH400	1000VGH400S			400
1000VGH450	1000VGH450S			450
1000VGH500	1000VGH500S			500
●1500GHSeries				
1500GH-016	1500GH-016S		AC1500V-100kA DC1500V-50kA(L/R=2ms)	16
1500GH-020	1500GH-020S			20
1500GH-025	1500GH-025S			25
1500GH-032	1500GH-032S			32
1500GH-040	1500GH-040S			40
1500GH-050	1500GH-050S			50
1500GH-063	1500GH-063S			63
1500GH-080	1500GH-080S			80
1500GH-100	1500GH-100S			100
1500GH-125	1500GH-125S			125
1500GH-160	1500GH-160S			160
1500GH-200	1500GH-200S			200
1500GH-250	1500GH-250S			250
1500GH-315	1500GH-315S			315
1500GH-350	1500GH-350S			350
1500GH-400	1500GH-400S			400
1500GH-510	1500GH-510S			510
1500GH-630	1500GH-630S			630
1500GH-720	1500GH-720S			720

Table of CCC certified products / Table of TUV certified products

Model			Rated Voltage and Blocking capacity*	Rated Amperage(A)	Self-declaration No
●500VSK/500VSHSeries					
500VSH10	500VSK10		AC400V-10kA DC350V(L/R10ms)-10kA	10	2020980308000732
500VSH20	500VSK20			20	
500VSH36	500VSK36			36	
●500SF/500SFKSeries					
500SF-10	500SFK10		AC500V-50kA DC500V(L/R10ms)-10kA	10	2020980308000741
500SF-16	500SFK16			16	
500SF-20	500SFK20			20	
●400KH/400KHKSeries					
400KH-5	400KHK05		AC400V-50kA DC260V(L/R10ms)-50kA	5	2020980308000740
400KH-10	400KHK10			10	
400KH-15	400KHK15			15	
400KH-20	400KHK20			20	
400KH-25	400KHK25			25	
400KH-30	400KHK30			30	
400KH-35	400KHK35			35	
400KH-40	400KHK40			40	
400KH-50	400KHK50			50	
400KH-60	400KHK60			60	
●660CF/660KH/660KHKSeries					
660CF-5	660KH-5	660KHK05	AC660V-10kA DC450V(L/R10ms)-10kA	5	2020980308000734
660CF-10	660KH-10	660KHK10		10	
660CF-15	660KH-15	660KHK15		15	
660CF-20	660KH-20	660KHK20		20	
660CF-25	660KH-25	660KHK25		25	
660CF-30	660KH-30	660KHK30		30	
660CF-35	660KH-35	660KHK35		35	
660CF-40	660KH-40	660KHK40		40	
660CF-50	660KH-50	660KHK50		50	
660CF-60	660KH-60	660KHK60		60	
●350GHSeries					
350GH-016	350GH-016S		AC350V-50kA DC250V(L/R10ms)-50kA	16	2020980308000736
350GH-020	350GH-020S			20	
350GH-025	350GH-025S			25	
350GH-032	350GH-032S			32	
350GH-040	350GH-040S			40	
350GH-050	350GH-050S	350GHK050		50	
350GH-063	350GH-063S			63	
350GH-080	350GH-080S	350GHK080		80	
350GH-100	350GH-100S	350GHK100		100	
350GH-125	350GH-125S			125	
350GH-160	350GH-160S			160	
350GH-200	350GH-200S			200	
●660GHSeries					
660GH-016	660GH-016S		AC660V-50kA DC450V(L/R10ms)-50kA	16	2020980308000735
660GH-020	660GH-020S			20	
660GH-025	660GH-025S			25	
660GH-032	660GH-032S			32	
660GH-040	660GH-040S			40	
660GH-050	660GH-050S			50	
660GH-063	660GH-063S			63	
660GH-080	660GH-080S			80	
660GH-100	660GH-100S			100	
660GH-125	660GH-125S			125	
660GH-160	660GH-160S			160	
660GH-200	660GH-200S			200	
660GH-250	660GH-250S			250	
660GH-315	660GH-315S			315	

Model			Rated Voltage and Blocking capacity*	Rated Amperage(A)	Self-declaration No
●660GH Series					
660GH-350	660GH-350S		AC660V-50kA DC450V(L/R10ms)-50kA	350	2020980308000744
660GH-400	660GH-400S			400	
660GH-450	660GH-450S			450	
660GH-500	660GH-500S			500	
660GH-630	660GH-630S			630	
660GH-710	660GH-710S			710	
●750GH/GHK Series					
750GH-020	750GH-020S		AC850V-50kA DC600V(L/R10ms)-50kA	20	2020980308000729
750GH-025	750GH-025S			25	
750GH-032	750GH-032S			32	
750GH-035	750GH-035S			35	
750GH-040	750GH-040S			40	
750GH-050	750GH-050S	750GHK050		50	
750GH-063	750GH-063S			63	
750GH-075	750GH-075S			75	
750GH-080	750GH-080S	750GHK080		80	
750GH-100	750GH-100S	750GHK100		100	
750GH-125	750GH-125S			125	
750GH-160	750GH-160S			160	
750GH-200	750GH-200S			200	
●1000GH Series					
1000GH-016	1000GH-016S		AC1000V-50kA 【16A～630A】 DC800V-50kA (L/R10ms) 【16A～160A】 DC700V-50kA (L/R10ms) 【200A～630A】	16	2020980308000731
1000GH-020	1000GH-020S			20	
1000GH-025	1000GH-025S			25	
1000GH-032	1000GH-032S			32	
1000GH-040	1000GH-040S			40	
1000GH-050	1000GH-050S			50	
1000GH-063	1000GH-063S			63	
1000GH-080	1000GH-080S			80	
1000GH-100	1000GH-100S			100	2020980308000730
1000GH-125	1000GH-125S			125	
1000GH-160	1000GH-160S			160	
1000GH-200	1000GH-200S			200	2020980308000745
1000GH-250	1000GH-250S			250	
1000GH-315	1000GH-315S			315	
1000GH-400	1000GH-400S			400	
1000GH-500	1000GH-500S			500	
1000GH-630	1000GH-630S			630	
●1000VGH Series					
1000VGH□□□	1000VGH□□□S		AC1000V-50kA DC800V-50kA L/R=10ms	16-100	2022980308000040
				125-160	2022980308000042
				250	2022980308000040
				315-350	2022980308000039
				400-500	2022980308000038
●1500GH Series					
1500GH-□□□	1500GH-□□□S		AC1500V-50kA DC1200V-50kA L/R=10ms	16-80	2022980302000064
				100-125	2022980308000020
				160-250	2022980308000024
				315-400	2022980308000025
				510-720	2022980308000026

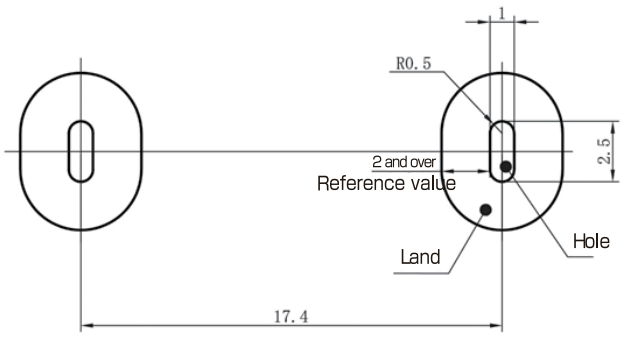
CCC certification Our fuse is an item to which the compulsory product certification self-declaration evaluation method is applied.
CQC has approved that the self-declaration in the CCC standard is based on the GB standard.

TUV ceritificated products

Model			Rated Voltage and Blocking capacity*	Rated Amperage(A)	Self-declaration No
●25LK Series					
25LKA20B			AC250V-10kA DC350V(L/R10ms)-10kA	20	J50165367
25LKA30B				30	
25LKA50B				50	
25LKA75B				75	
25LKA100B				100	
25LKB100B				100	
25LKB150B				150	
25LKB200B				200	
25LKB260B				260	
25LKB300B				300	
25LKB350B				350	

500SFK series fuse board mounting design data

1. Recommended mounting hole pitch



2. Fuse temperature increase

The fuse temperature depends on substrate pattern and current flow, etc.

Our substrate fuse temperature increase characteristics are according to a copper layer width that gives 1A/mm (coper layer thickness 35μm) for a current of 50% rated current.

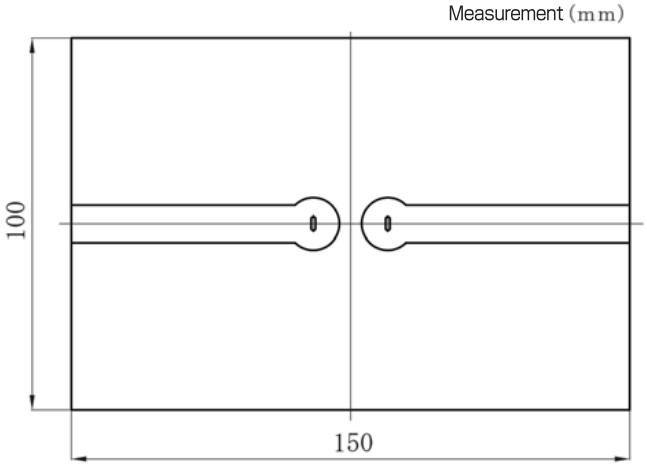
● Conditions

Board size : 150mm×100mm

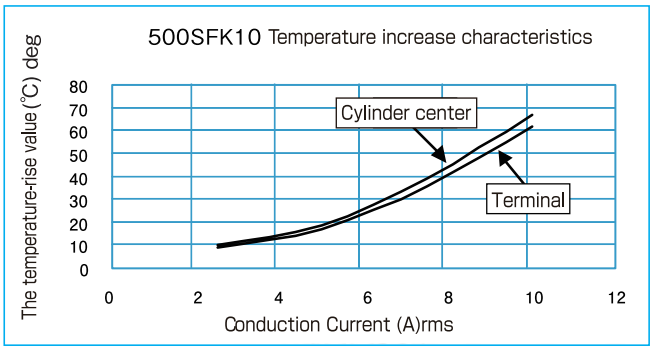
Board material : FR−4

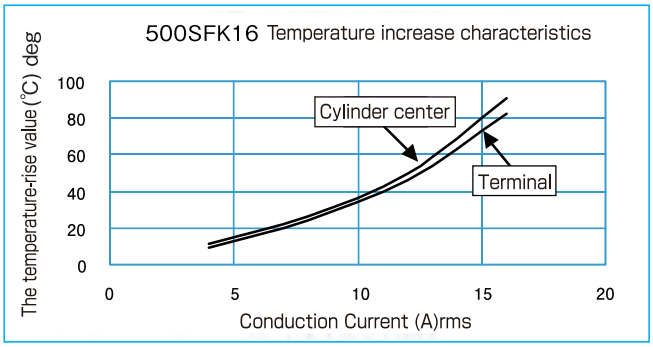
Copper layer thickness: 35μm

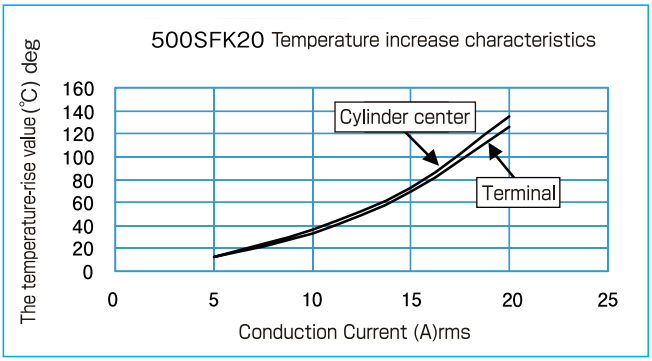
Measurement (mm)



● Temperature increase characteristics



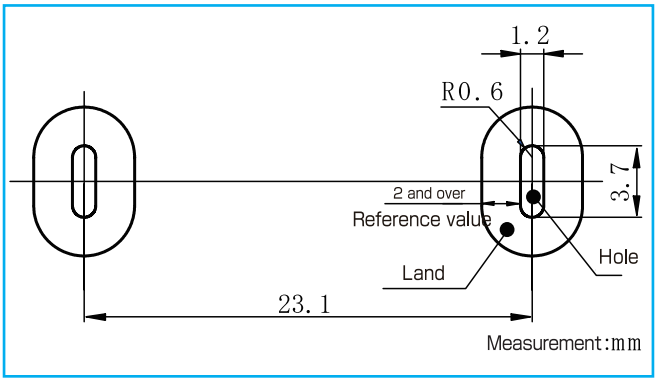




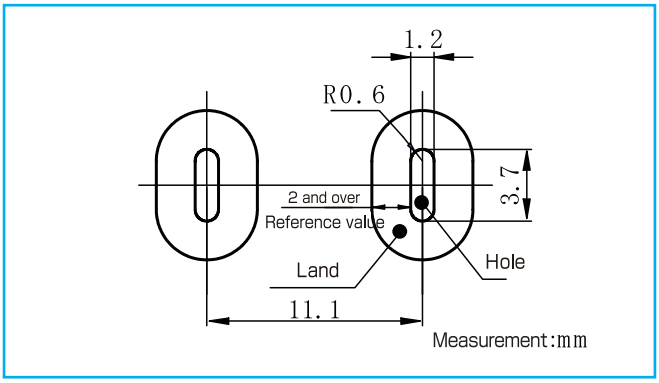
KHK series fuse board mounting design data

1. Recommended mounting hole pitch

●660KHK Series



●400KHK Series



2. Creepage distance, air clearance

A large voltage is applied between both terminals during fuse cut-off.

Recommended values for land separation and distances from other components are given in the table below.

Series	Antithetic pattern·distance		Antithetic fuse-component separation
	Coated substrate	Uncoated substrate	
400KHK	3mm and over	5mm and over	4mm and over
660KHK	5mm and over	8mm and over	6mm and over

There is the potential for substrate contamination to decrease insulation on the 400KHK. In the event a large fuse terminal separation is necessary or terminal separation is insufficient according your regulations please use the 660KHK.

3. Fuse temperature increase

The fuse temperature depends on substrate pattern and current flow, etc.

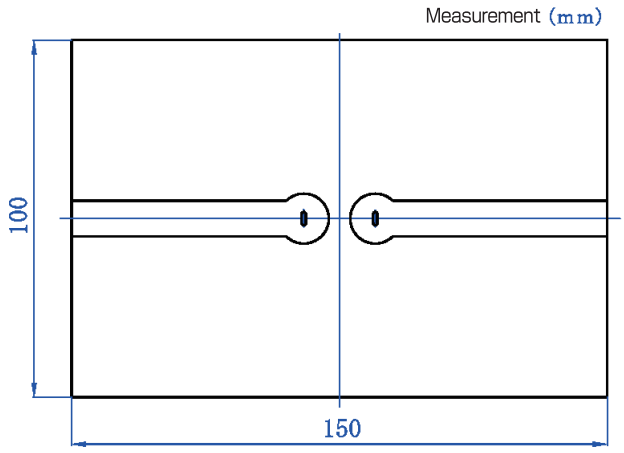
Our substrate fuse temperature increase characteristics are according to a copper layer width that gives 1A/mm (coper layer thickness 35μm) for a current of 50% rated current.

● Conditions

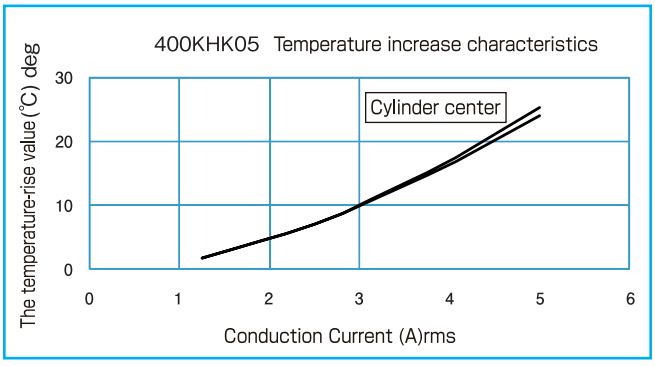
Board size : 150mm×100mm

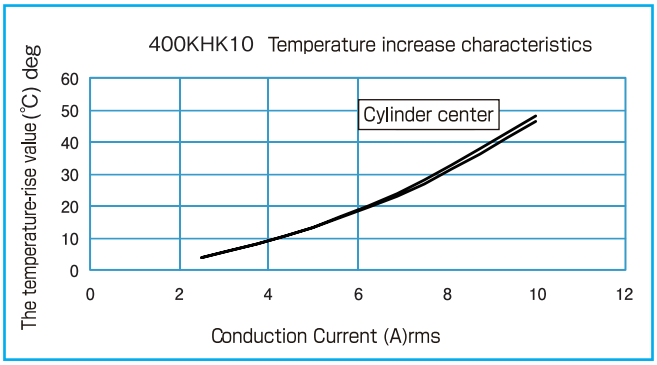
Board material : FR−4

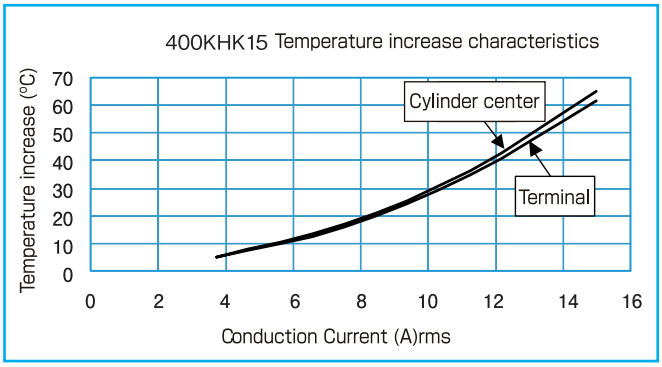
Copper layer thickness : 35μm

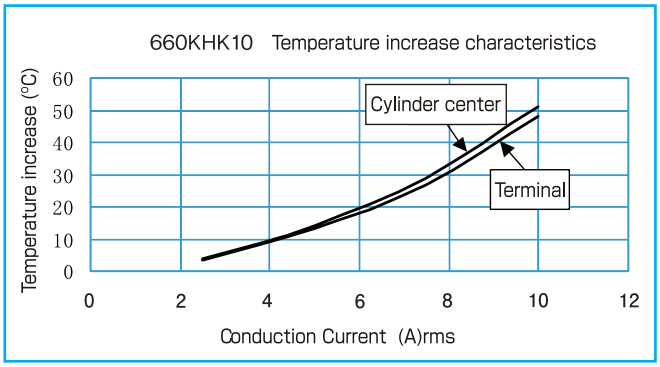


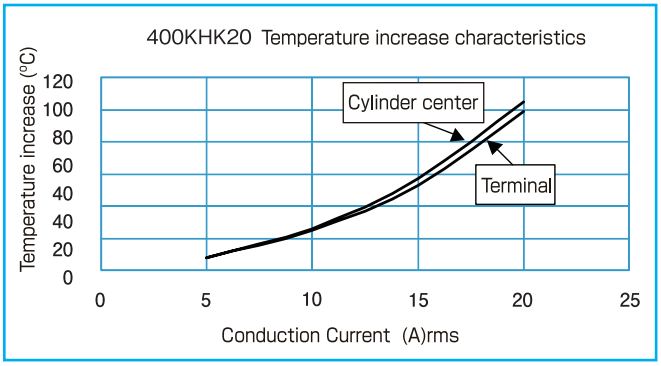
●400KHK Temperature increase characteristics

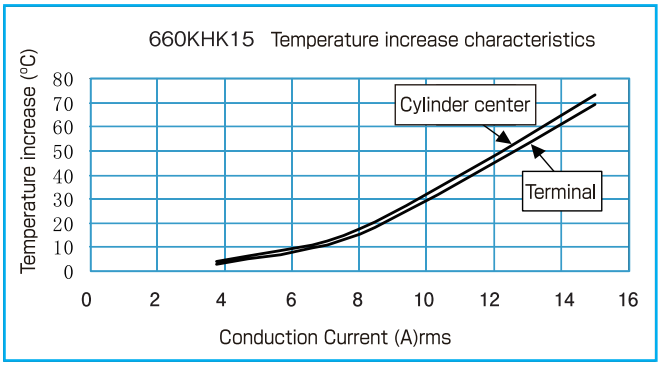


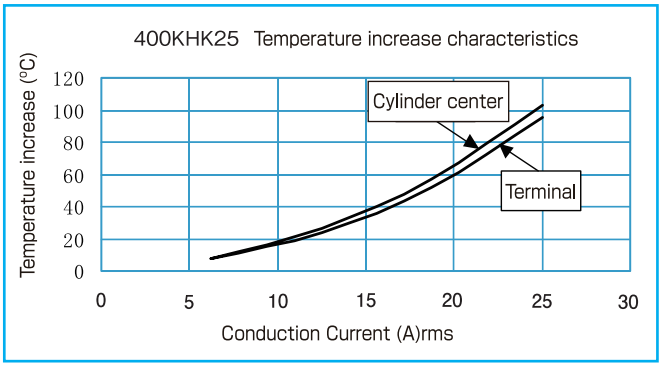


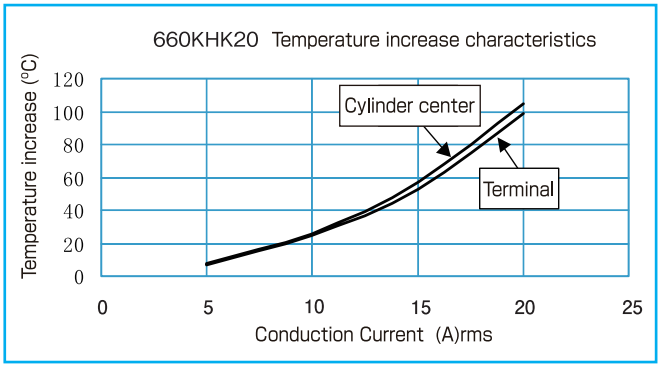


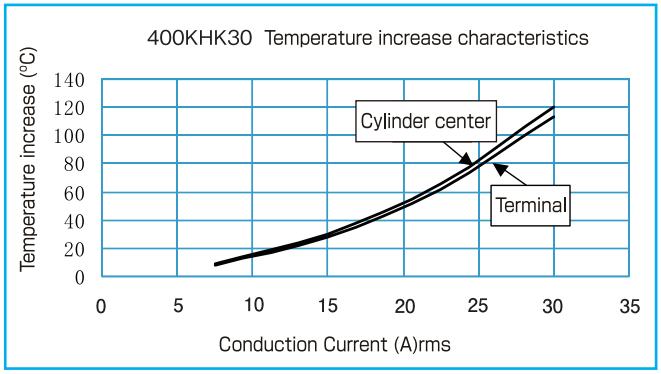


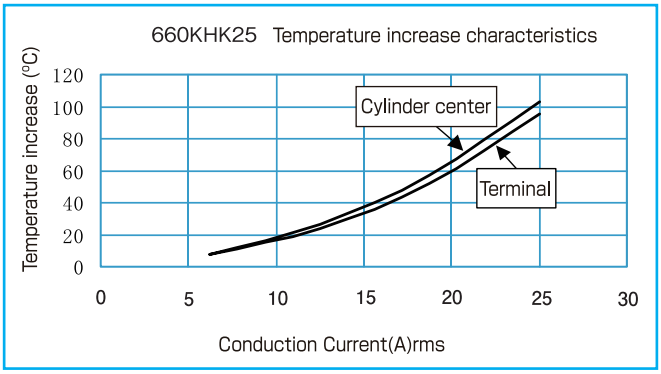




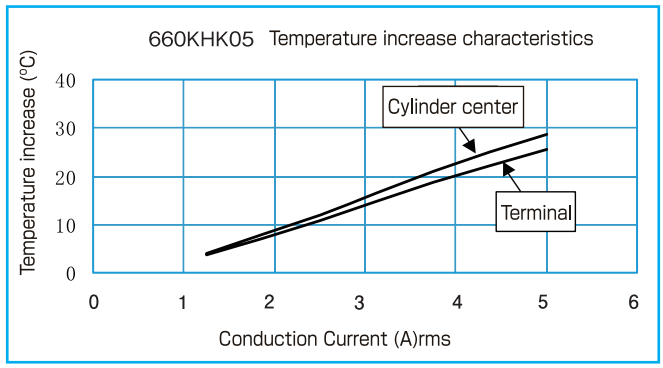


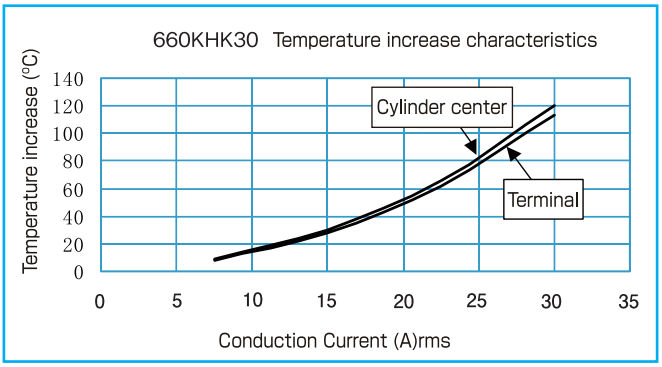






●660KHK Temperature increase characteristics

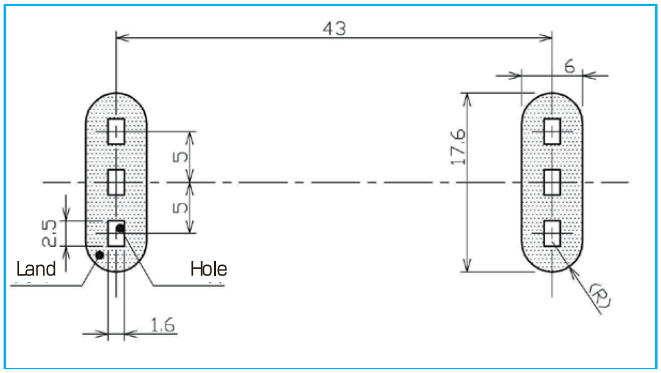




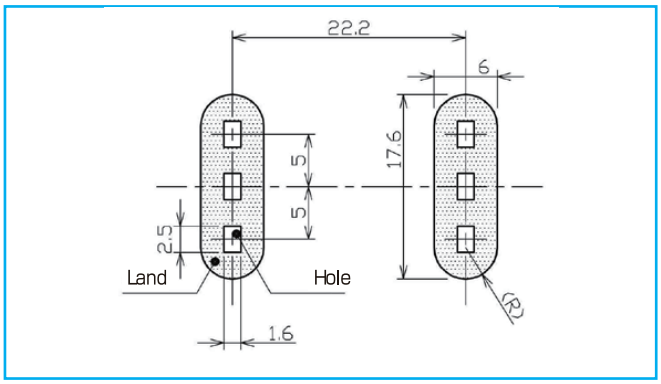
GHK series fuse board mounting design data

1. Recommended mounting hole pitch/recommended land

●750GHK Series



●350GHK Series



2. Creepage distance, air clearance

A large voltage is applied between both terminals during fuse cut-off.

Recommended values for land separation and distances from other components are given in the table below.

Series	Land separation between terminals		Fuse-component separation
	Coated substrate	Uncoated substrate	
350GHK	3mm or higher	5mm or higher	4mm or higher
750GHK	5mm or higher	8mm or higher	6mm or higher

3. Fuse temperature increase

The fuse temperature depends on substrate pattern and current flow, etc. Our substrate fuse temperature increase characteristics are according to a copper layer width that gives 1A/mm (coper layer thickness 35μm) for a current of 50% rated current.

E.g. In the case of a 100A rated fuse, the test is with a pattern of a 50 mm copper layer width.

● Test substrate

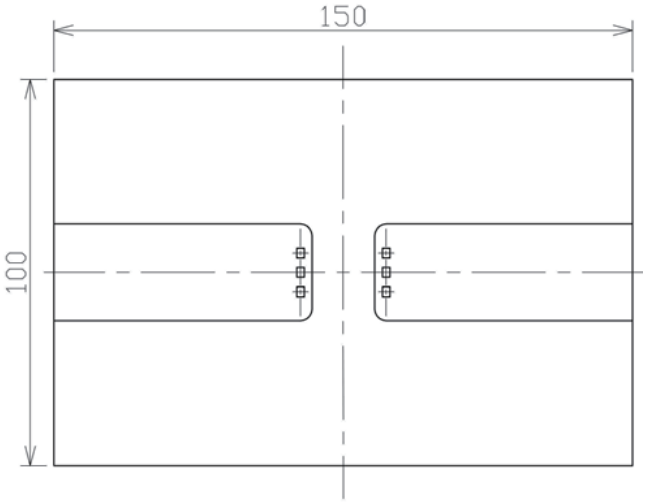
Board size : 150mm×100mm

Board material : FR−4

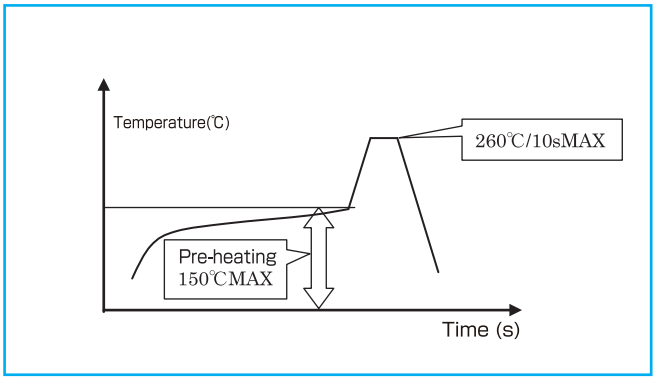
Copper layer thickness : 35μm

Copper layer width : Depends on rated current

unit:mm



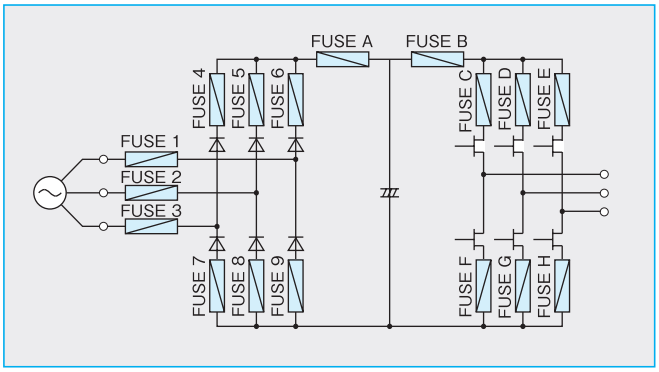
Substrate-mounted fuse temperature profile for flow soldering method



PROTECT FUSE USER'S GUIDE

Where in the circuit should I use a fuse?

First, consider what you would like to protect with the fuse.
Examples of applying position on the inverter circuit



●To prevent secondary damage to supplied power

- ●To protect from condenser short circuit or IGBT short circuit ··· Applicable to FUSE A
- ●To cope with accidents from condenser short circuit, IGBT short circuit, and diode short circuit ··· Applicable to FUSE 1 and 3.
- ●To cope with condenser short circuit, IGBT short circuit, diode short circuit, earth short circuit ··· Applicable to FUSE 1, 2, and 3, and also to FUSE 4, 5, 6, 7, 8, and 9.

●To prevent diode chips from being damaged

- ●If you would like to prevent explosion or ignition of chips with fewer fuses:
  - ●To prevent damage to a chip by adverse DC current ··· Applicable to FUSE A.
  - ●To prevent damage to a chip by supplied power current ··· Applicable to FUSE 1 and 3.
  - ●To prevent both of the above ··· Applicable to FUSE A, 1, and 3.
- ●To prevent damage to a chip by adverse DC current ··· Applicable to FUSE A.
- ●If you would like to reuse sound chips as well as to prevent explosion or ignition of chips ··· Applicable to FUSE 4, 5, 6, 7, 8, and 9.

●To prevent explosion and short-circuit mode of IGBT or thyristor chips

- ●If you would like to protect with fewer fuses ··· Applicable to FUSE B.
- ●If you would like to reuse sound chips (only for thyristors) ··· Applicable to FUSE C, D, E, F, G, and H.

How to select a fuse

●Main factors in selection

- ●Working voltage (AC or DC)
- ●Normal electric current
- ●Inrush current
- ●Ambient temperature
- ●Breaking current (maximum breaking current and minimum breaking current)
- ●Durability performance
- ●Installation structure

Select an appropriate fuse taking these factors into consideration.

●Working voltage

Set the rated voltage of the fuse over the voltage of the circuit where the fuse is to be inserted.

●Normal electric current

To avoid unnecessary fusing, lower the load factor of the normal electric current according to the rated amperage of the fuse. The main load factors used for our products are as follows:
*The load factor is at the ambient temperature of 25°C.

Load Factor / Model	Constant current and alternating sine wave current	Pulse wave form of inverters / power regulators
250SF/SFK	60% or less	50% or less
500SF/SFK		
660CF/KH/KHK	50% or less	40% or less
400KH/KHK		
500VSK/500VSH/400VSK		
500KFK		
350GHK/750GHK	70% or less	60% or less
250GH/350GH/660GH	60% or less	50% or less
1000GH/1000VGH/1500GH	60% or less	50% or less
500KFF/500KFH	60% or less	50% or less

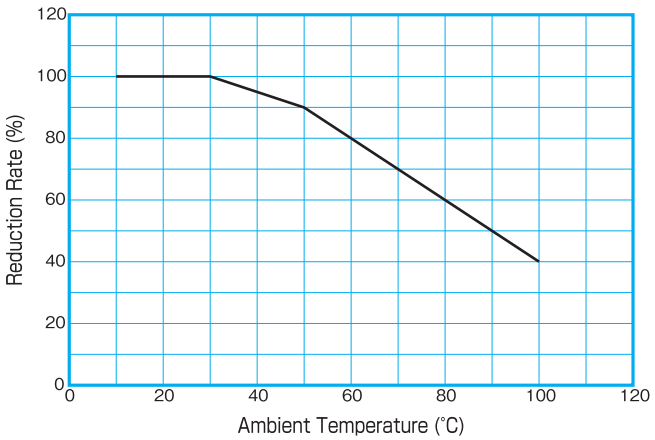
●Inrush current (when considering fusing I^2t)

The fusing I^2t indicated in this catalog is the energy of the fused electric current in time when the heat that occurred does not radiate from the inner conductor by heat conduction. The fusing I^2t varies according to fuse types.
The fusing I^2t has to be considered if the Inrush current (surge electric current, start electric current, plunge electric current, and so on) occurs. If the I^2t of the Inrush current is higher than the fuse I^2t, it will cause unnecessary fusing. By setting the I^2t of Inrush current to less than 25% of the fuse's I^2t, the fuse will withstand the repetitive Inrush current over 30,000 times.

●Ambient temperature

The fuse characteristics described above assume an ambient temperature of 25°C. At a higher ambient temperature, the fuse works in a hotter state, and therefore its life will be shorter. If the ambient temperature is high, reduce the load factor. (Refer to chart titled "reduction rate by the ambient temperature.").

Reduction rate by ambient temperature



●Fuse

Operating temperature and humidity	-25℃~+85℃ Relative humidity:85% or less (However, no freezing or condensation will occur.)
Storage temperature and humidity	-25℃~+40℃ Relative humidity:85% or less (However, no freezing or condensation will occur.)

●Fuse Holders

Operating temperature and humidity	-20℃~+55℃ Relative humidity45~85% or less (However, no freezing or condensation will occur.)
Storage temperature and humidity	-20℃~+40℃ Relative humidity 85% or less (However, no freezing or condensation will occur.)

●Micro Switches
AMS-3B□/7B□/01B

Operating temperature and humidity	-40℃~+85℃ (However, no freezing or condensation will occur.) Relative humidity60% or less (85% or less at 5~35℃)
Storage temperature and humidity	+5℃~+35℃ (However, no freezing or condensation will occur.) Relative humidity85% or less

Notation:Celsius

FOR SAFE USE / PRODUCT WARRANTY

●Breaking current

●Maximum breaking current
Assume that the current breaking capacity of the fuse is greater than the maximum broken current of the circuit.

●Minimum breaking current
Use the fuse with other protection equipment as there may be a possibility of a restrike arc after fusing if an accidental current in the circuit is below the minimum breaking current.

●Circuit time constant
When using for a direct-current circuit, use it under the time constant prescribed by the breaking capacity (or reduce the voltage by its circuit time constant).

FOR SAFE USE

CAUTION!

●Installation/removal, wiring work, maintenance, and inspection must be done by an expert.

●Do not use under an abnormal environment such as a place with high temperature and/or high humidity, a dusty place, a place filled with corrosive gas, or a place that may be subject to physical vibrations and/or shock.

●Do not expose to any liquids.

●Make sure that the terminal is securely tightened. Using a loose terminal may cause a fire.

●Use a wire suitable for the working voltage and the conduction current. When it is used with incomplete wiring, it may cause a fire.

●Do not dismantle or remodel the product.

●Do not use the fuse if you find any damage or alterations while unpacking.

●Use below the rated voltage of the fuse. If exceeded, a burnout or an explosion may occur.

●Use the fuse such that its current breaking capacity is not exceeded. If exceeded, a burnout or an explosion may occur.

●When using for the following equipment or purposes, consult our business desk and finalize specifications for delivery.
Safety and security in desigh and use are the user's responsibility.
- ●Use on equipment or for a purpose that may directly result in injury or death such as medical equipment.
- ●Use on a train, an elevator, and so on that may endanger human lives.
- ●Use on equipment or use for purposes that may involve a shock or a vibration, such as when loading on a vehicle or a ship.
- ●Use on equipment or for purposes that may have a serious effect on society and/or public (e.g., in a traffic system).
- ●In the case of current rise sharply when short-circuited
- ●Use on equipment or use for purposes related to the above.

●When storing, transporting, or moving the fuse, make sure to follow the precautions below and store and transport it properly.
·Fall ·This side up ·Use of cushioning material
Excessive shocks on the top, bottom, left and right may cause damage.

●Do not use a fuse which was fallen from height such a working desk in the process of assembly.
*If you use a fuse that have internal damaged by dropped or a condition that as close as it, an unexpected cutoff or unusual cutoff of the fuse may cause a serious accident.

WARNING

● When used in a DC circuit, Please use that it is less than or equal to the cutoff capacity time constant (or use by adjusting the voltage lower depending on time constant).Even if it is lower, if the current rises sharply, there is a risk of burnout or an explosion.

●When there is a possibility of block-off below the minimum breaking current, take measures such as using other means of protection in addition to the fuse. When no measures are taken, it may cause a burnout or an explosion.

●When the fuse blocks off, the welding arc voltage occurs between the fuse poles, so be sufficiently careful about arrangement of parts around the fuse.

●A fuse protecting a semiconductor becomes hotter than other general parts even under normal conditions.
Touching the fuse may cause burns when the equipment is turned on or after an accidental block-off; attach a label to call attention to the high temperature near the fuse installed on the equipment.

DANGER

●Be careful not to touch a fuse by hand when an electric current is flowing; it may cause an electric shock.
When installing the product on equipment, make sure that a shock-guard protector is attached to the fuse or a label is put nearby to indicate the danger of electric shock.

PRODUCT WARRANTY

Period of Warranty

The period of warranty is one year from the date of delivery.

Scope of Warranty

We will re-deliver the same product or a substitute product promptly in case a product defect causes an inconvenience during the above warranty period. However, the following exceptions apply:

1. When the inconvenience is due to the customer's decision when adopting the product.
2. When an inconvenience occurred that could not be predicted in a performed evaluation test.
3. When the product was exposed to physical, chemical, and/or electrical-engineering-related stress without the manufacturer' s consent.
4. When it was difficult to perceive the concerned defect with the level of science and technologies of both the manufacturer and the customer at the time of the product delivery.
5. When the defect is based on directions of the customer who was engaged in its design.
6. When the malfunction is due to a reason not deriving from the supplied products.
7. When the product defects are due to remodeling by someone other than the manufacturer, or when the product defects are caused by violating conditions about the specifications and/or storage that are determined by the manufacturer.
8. When the supplied product is used, without the manufacturer's prior consent, in situations in which the product defects could harm human lives or cause great physical damage to occur.

Notice about the Warranty

1. Note that compensations are made through the delivery of a replacement or substitute in all cases.
2. When using our fuse for a market where high reliability and safety are required, take precautions in the design of, and security measures for, the applicable device at your own responsibility.
3. If a malfunction or a breakdown of unknown origin causing fusing occurs remove the fuse as-is and return it to our office.
4. For the AMS series, the warranty is also in accordance with the warranty conditions of the microswitch manufacturer as well as those mentioned above. Refer to the warranty of the microswitch manufacturer.

Note that the descriptions in this catalog are subject to change without notice for product improvements or for other reasons.
Various graph data are reference values.

HINODE Founded in 1946

HINODE ELECTRIC CO.,LTD.

1-18-9 Hokima, Adachi-ku, Tokyo 121-0064, JAPAN
URL:http://www.hinodedenki.co.jp

＊The specifications are subject to change without notice for product improvements.

Agency

Rev-01