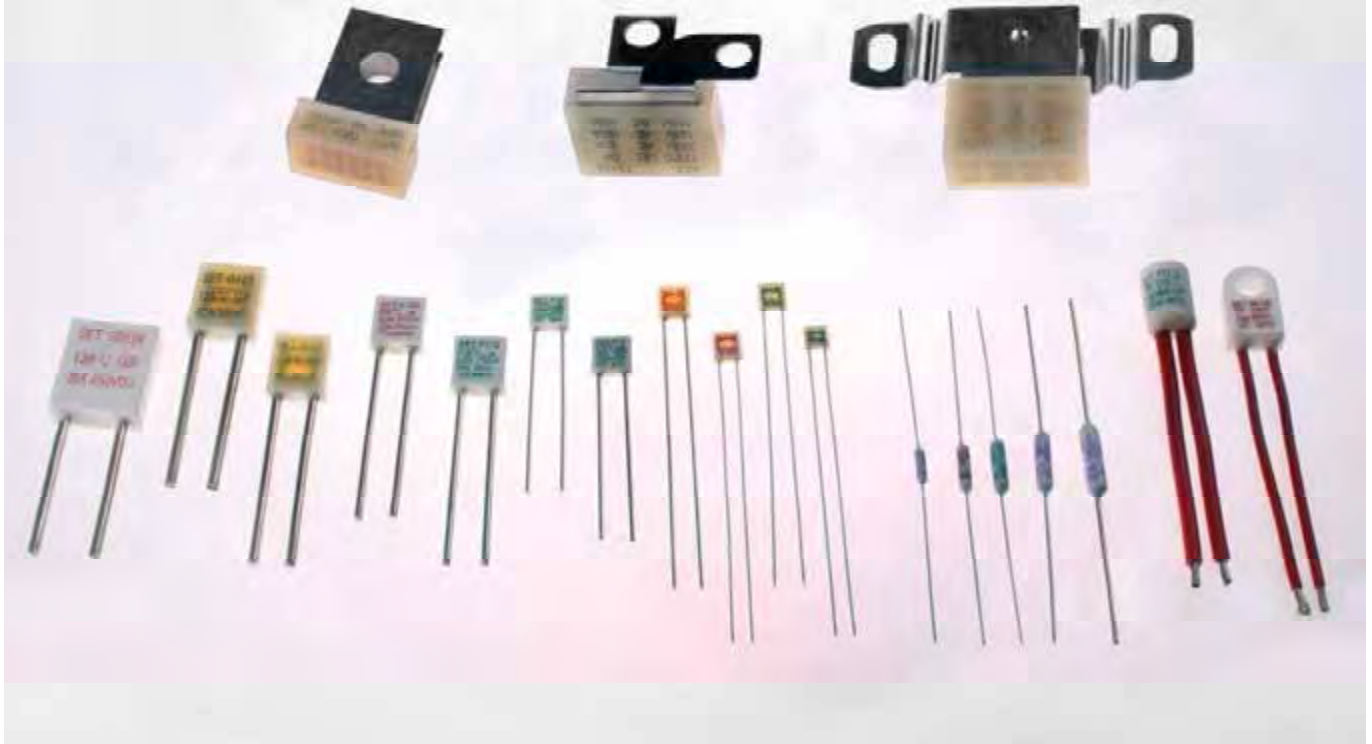


Thermal links Thermal cutoff (TCO) Thermal fuse



Features and Benefits

- Low Resistance
- Sealed Construction
- Radial and Axial Shape
- Rated Current: 1A~200A
- Compact size and Small size
- Function Temperature: 76C~221C
- One-time Over Temperature protection
- High accuracy of Cutoff temperature $\pm 2C$

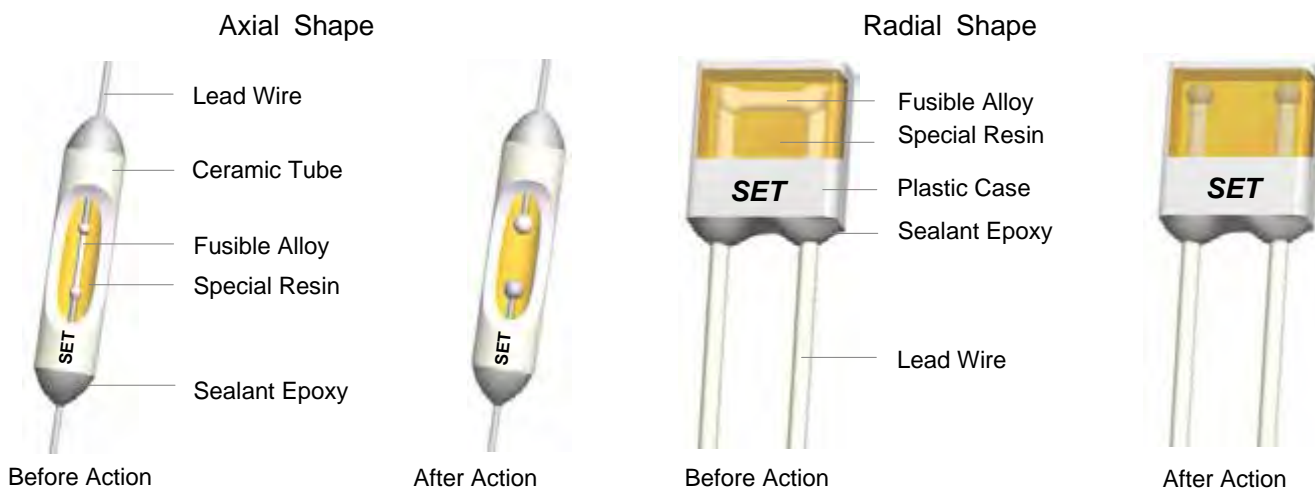


Thermal-links/Thermal cutoff/Thermal fuse

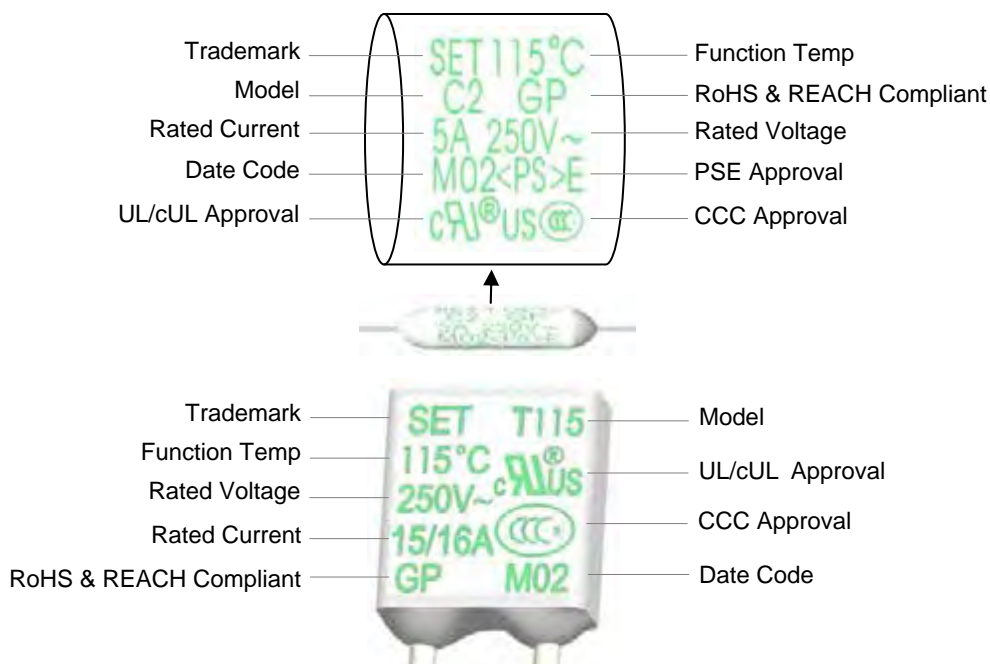
Product Description

SET[®] Alloy thermal cutoffs, defined as non-resettable, are single action devices that are widely used for the electrical equipments against over temperature. The thermal cutoffs are composed of the fusible alloy with low melting point and special resin, encapsulated in a plastic or ceramic housing. Under normal operated, the fusible alloy is joined by the two lead wires within the housing. When the thermal cutoff senses an abnormal heat and reach a preset temperature, the fusible alloy melts and disconnects the circuit completely with the aid of the special resin. Both Axial and Radial shapes are available, with rated current from 1A to 200A, Function temperature 76°C~221°C, certificated including UL, cUL, VDE, TUV, PSE, KTL, CCC and RoHS, REACH Compliant.

Structure Diagrams



Marking














Thermal-links/Thermal cutoff/Thermal fuse

Glossary of Terms

- Thermal-link: also known as thermal cutoff or thermal fuse, all are the same in this context, function one only, non-resettable.
- Rated Function temperature (Tf):
The temperature of the Thermal-link which causes it to change its state of conductivity with a detection current up to 10mA as the only load.
Tolerance: +0°C, -10°C UL, VDE, IEC Standard
Tolerance: ±7°C only PSE
- Fuse temperature (Fuse-temp):
The temperature is measured with silicone oil bath of which temperature is increased at the rate of 0.5°C~1°C/ min, with a detection current up to 10mA as the only load.
- Holding temperature (Th) :
The Max. temperature at which a TCO will not change its state of conductivity when conducting rated current for 168Hours.
- Max. temperature limit (Tm):
The Max. temperature at which the TCO can maintain its mechanical and electrical properties without being impaired for 10 mins.
- Rated current (Ir):
The current used to classify a Thermal-link, which is the Maximum current that thermal cutoffs allow to carry and are able to cutoff the circuit in safety.
- Rated voltage (Ur) :
The voltage used to classify a Thermal-link, which is the Maximum voltage that is allowed to apply to the circuit in which the thermal cutoff is used.
- Transient overload current (Ip):
A direct current pulse train which the thermal-link is able to withstand without impairing its characteristics.

Agency Approvals

Agency	Standards	File Number	Category
 UL	UL60691	E214712	XCQM2
 cUL	CAN-CSA-E60691	E214712	XCQM8
 TUV	EN60691	R50161772/R50112713/14/15/16/R50207621	
 VDE	EN60691	40004041/40017055/57/40018082	
 PSE	J60691	PSE09020139/40/41/42/43/44	
 KTL	K60691	SU05023-6001A/2A/3A/11001/2 /3	
 CCC	GB9816	2009010205350866/7/8/9744 2009010205346076/78/82/83 2009010205470986 2011010205470983/6	
 	● RoHS and REACH Compliant		

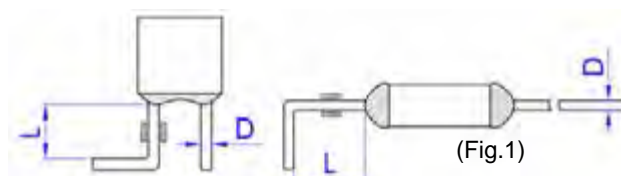
Safety Precautions

1. Each thermal-link has specific Electrical and Temperature Rated and must be used with in the prescribed Rated. These Rated include Tf (Rated Function Temperature), Th or Tc (Holding Temperature), Tm (Maximum Temperature Limit), and the electrical Rated. Please see the technical data sheet.
2. For reason of safety that a thermal-link is a non-repairable item and that, in case of replacement an equivalent thermal-link with the same catalogue number shall be used, mounted in exactly the same way.
3. Install thermal-links so that their temperatures do not continuously exceed the Holding Temperature specified in the individual specification.
4. The end product should be designed so that thermal-link detects only intended heat source (radiant, convection, and / or conductance). For example, in a heater application, thermal-link should not be heated through lead wire which will accelerate the fusing off of the thermal-link, In case of a transformer or motor application, where the temperature should be controlled in a transformer or motor coil, and thermal-link should have good heat conductive contact with the transformer or motor coil.
5. It is recommended that using the dummy thermal-link having an internal thermocouple to select the proper temperature Rated and location of the thermal-link.
6. Do not locate the thermal-link on an assembly subjected to severe continuous vibration.
7. The end product should be tested to ensure that potentially abnormal conditions do not exposed the thermal-link to the temperature exceeding its Tm.
8. The seal or body must not be damaged, burned or over heated.
9. Mounting design of the thermal-links.
 - 9.1 Mount the thermal-link at the location where temperature rises evenly.
 - 9.2 Design the lead wire as long as possible and connect it in the way that tension or pressed torsion is not applied to the wire.

10. Lead wire bending .

- 10.1 If the lead has to be used by bending it, bend it at appropriate minimum away from the molded section, In the list below.

D	$\leq \Phi 1.0\text{mm}$	$> \Phi 1.0\text{mm}$
L	$\geq 3\text{mm}$	$\geq 5\text{mm}$



- 10.2 Use radio pinchers to bend the wire as shown in Fig.1 and not to damage the molded section of the case and the lead wire.
- 10.3 Leads should not be cut, nicked, bended sharply, fractured or burned during forming or installation.
- 10.4 Tangential forces on the leads must be avoided (i.e. pushing or pulling on the leads at angle to thermal-link body) as such forces may damage the seal of thermal-links.
11. The seal or body must not be damaged, burned or over heated.
12. Stress due to expansion and contraction of parts attached to the leads or body, vibration or other movements of parts should be considered when designing the end product. A flexible or bent heater lead or a cold, low resistance heater lead should be used to connect to Thermal-link.
13. Resistance of connections should be monitored to ensure minimal resistance. Improper connections or secure may result in premature failure of the thermal-link. Samples of joints should be inspected to ensure adequate mechanical bonding of lead to connection wires. Improper connections can cause damage to the seal or other parts which may result in shorting or nuisance tripping of the devices due to the generation of excessive heat at a faulty high resistance junction.
14. Splices and terminations.
 - 14.1 If it is necessary to bare the lead of wire, there shall be

Safety Precautions

an arrangement that prevents deflection or damage of the thermal-link wires.

14.2 Terminals or clamps should be of corrosion resistance materials.

14.3 Appropriate free lengths of wire and sufficiently flexible wire connections should be used. Thermal-links and splices should be secured to prevent vibration or flexing of thermal-links and splices during normal operation.

15. Soldering of leads.

15.1 Soldering should be carried out within the soldering conditions listed in table 1.

15.2 Because the thermal element of thermal-link is a fusible alloy which connected with lead wires, improper soldering operation (too high soldering temperature, too long soldering time, too short lead wire used etc.) will cause thermal element damaged by the excessive heat transmit from the lead wire which may result in premature opening of thermal-link.

15.3 When soldering is required under severe conditions listed other than specified table 1, use a heat sink on thermal-link lead wire between solder joint and thermal-link body.

15.4 Perform the soldering operation carefully so that the pull/push and twist tensions are not applied to thermal-link body and lead wire.

15.5 After soldering leave it for natural cooling for longer than 20 sec. During this cooling time, never move the thermal-link body and lead wire.

16. Location of thermal-link with regard to wet application.

If thermal-link is applied to coffeepot, hot-water heater, dryer, hygostat, etc., locate the thermal-link at the position where thermal-link is protected from breakage by pilling water or other liquid and from damage by high humidity.

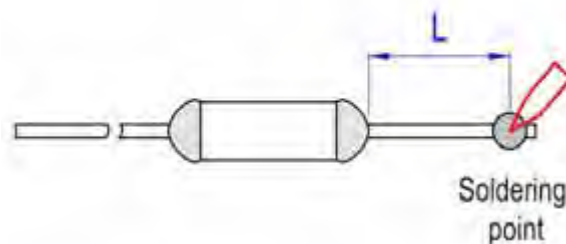
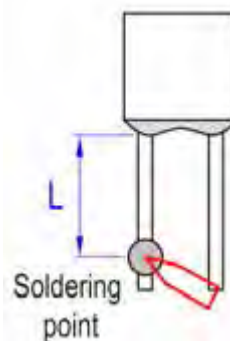
17. After Installation, the end construction shall comply with the appliance standard.

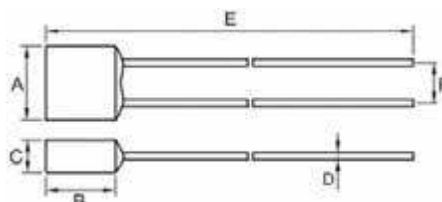
18. Read Standard Specification and Instruction Manual for use throughly.

Table 1. Soldering time (s)

Function Temperature T_f (°C)	Max allowable soldering time (s)			Solder temperature
	Length of Lead wire (L)			
	10mm	20mm	30mm	
76~101	1*	2	3	400°C
102~115	1*	2	3	
116~135	1*	3	5	
136~150	3	5	5	
151~221	4	6	7	

* Need to add auxiliary heat conduction for not damage the thermal fuse unexpectedly.





Dimensions (mm)

A	B	C	D(Φ)	E	F*
5.8±0.5	5.8±0.5	2.3±0.2	0.54±0.05	70±3	3.7±0.5

Note: The dimension F is measured from the root of leadwires.

Key Features

- Plastic case
- One-time over temperature protection
- Alloy type Thermal-link
- Environmental-friendly products

Specifications

Model	Tf (°C)	Fuse-Temp (°C)	Th (°C)	Tm (°C)	Ir (A)	Ur (V)	UL	cUL	PSE	VDE	TUV	CCC	KTL	RoHS
							UL	cUL	PSE	VDE	TUV	CCC	KTL	RoHS
K0	76	73±2	53	200	2	250AC	●	●	●			●		●
						60DC	●	●						●
K18	86	81±2	61	200	2	250AC	●	●	●	●		●	●	●
						60DC	●	●						
K1	102	98±2	79	200	2	250AC	●	●	●	●	●	●	●	●
						60DC	●	●						
K2	115	111±2	91	200	2	250AC	●	●	●	●	●	●	●	●
						60DC	●	●						
K3	125	121±2	100	200	2	250AC	●	●	●	●	●	●	●	●
						60DC	●	●						
K4	130	125±2	106	200	2	250AC	●	●	●	●	●	●	●	●
K8	133	130±2	111	200	2	250AC	●	●	●	●		●	●	●
K5	135	130±2	111	200	2	250AC	●	●	●	●		●	●	●
K9	136	131±2	112	200	2	250AC	●	●	●	●		●	●	●
K6	145	140±2	121	200	2	250AC	●	●	●	●		●	●	●
K7	150	145±2	126	200	2	250AC	●	●	●	●	●	●	●	●
K16	160	154±2	135	200	2	250AC			●			●		●
K32	205	199±3	169	250	2	250AC	●	●			●	●		●
K31	221	218±2	188	250	2	250AC	●	●			●	●		●

Applications

- Motor
- Battery
- Transformer
- Power supplies
- Lamps and lanterns
- Home electrical appliances

Customized

Other temperatures can be customized such as: 85°C, 90°C, 92°C, 95°C, 97°C, 100°C, 103°C, 108°C, 117°C, 120°C, 127°C, And etc.

The length of leadwires can be customized as required.

Packing Information

QTY: 50Kpcs/Carton

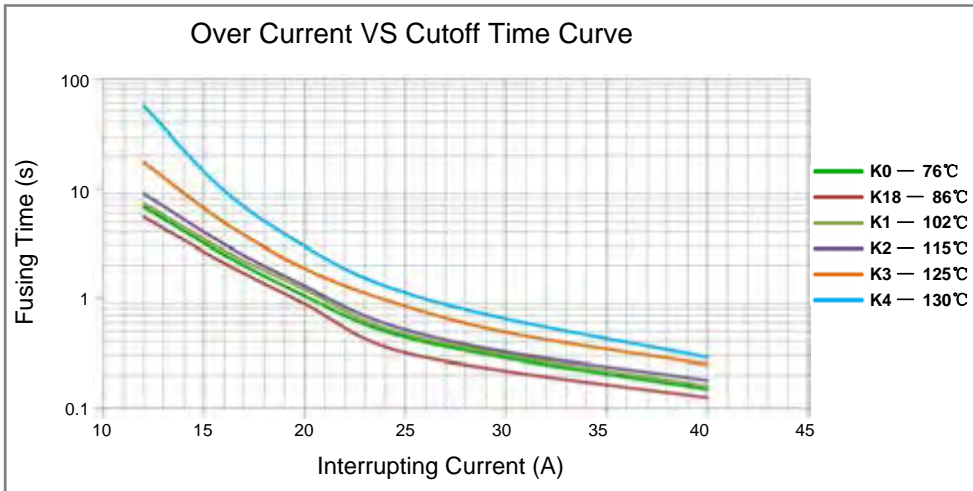
Carton Size: 44cm×30cm×26cm.

Agency Approvals

- UL/cUL: E214712
- VDE: 40017055
- TUV: R50161772/779
- PSE: 09020139/40/41/42/43/44
- CCC: 2009010205346083
- KTL: SU05023-6001A/6002A/6003B
- RoHS & REACH Compliant

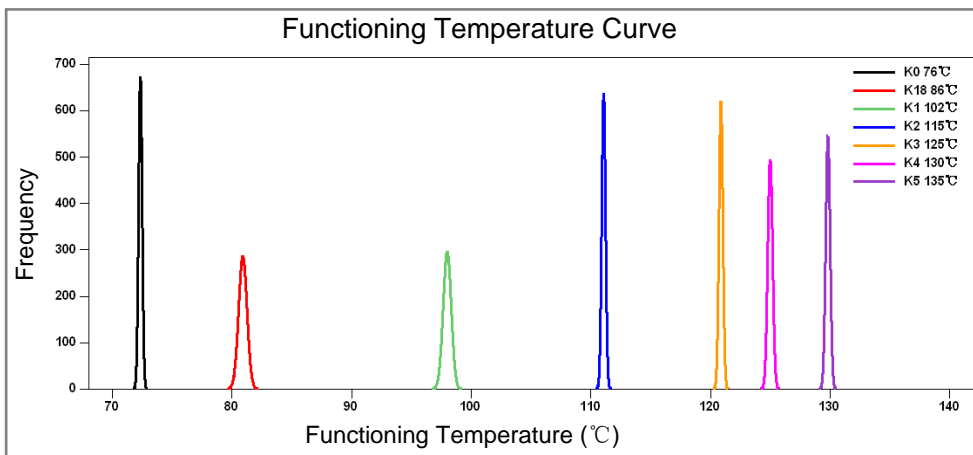
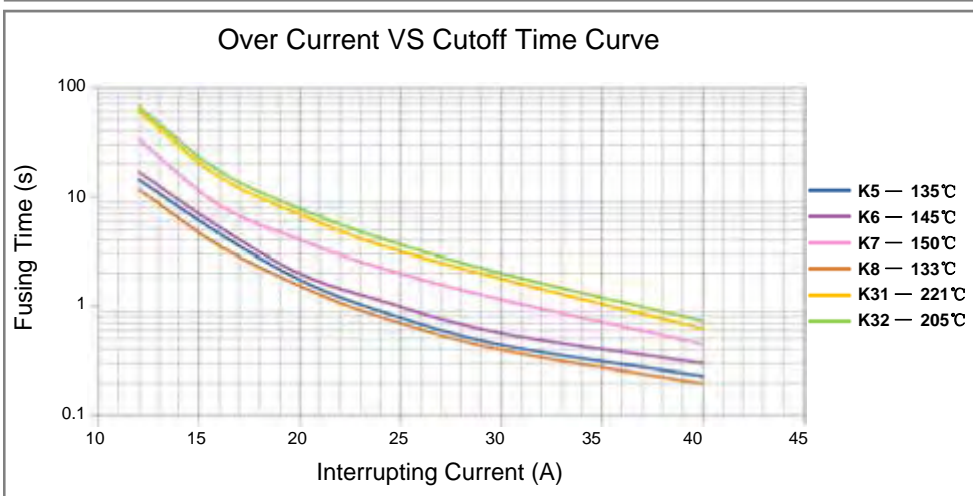


Performance Curve



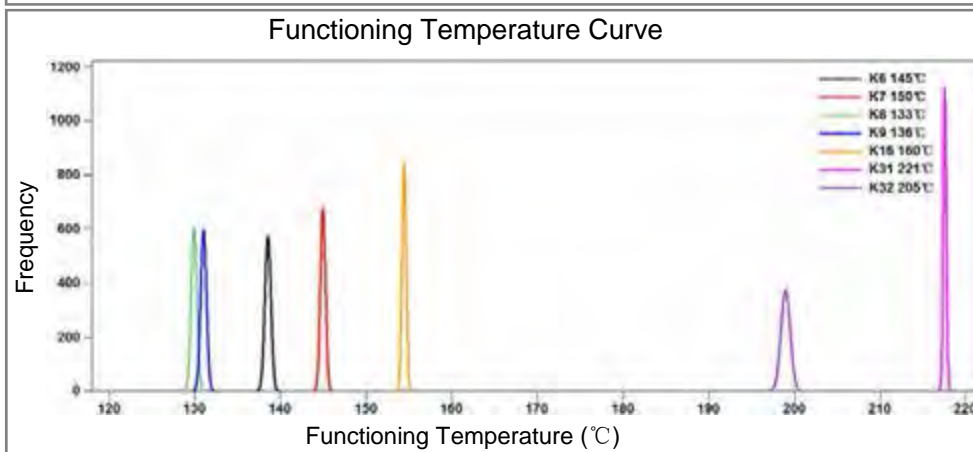
This is an illustrated curve for the model K series, describing the open time VS Multi-times rated current in the condition of the room temperature 25°C.

(This curve is for reference only)

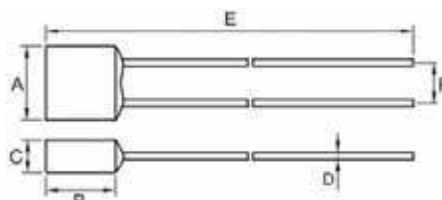
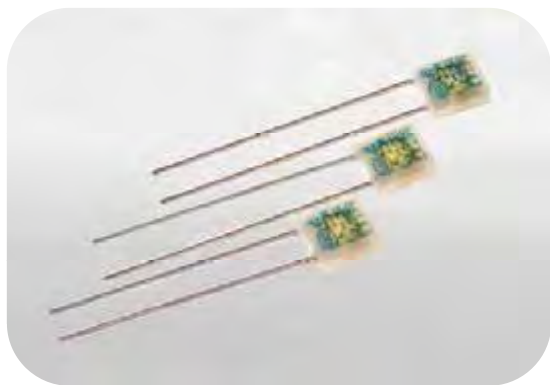


This is an illustrated curve for the model K series, The temperature is measured with silicone oil bath of which temperature is increased at the rate of 0.5°C~1°C/ min, with a detection current up to 10mA as the only load.

(This curve is for reference only)



Frequency: Concentration ratio of real opening temperature measured in the preset conditions.



Dimensions (mm)

A	B	C	D(Φ)	E	F*
5.8±0.5	5.8±0.5	2.3±0.2	0.54±0.05	70±3	3.7±0.5

Note: The dimension F is measured from the root of leadwires.

Key Features **Specifications**

- Plastic case
- One-time over temperature protection
- Alloy type Thermal-link
- Environmental-friendly products

Model	Tf (°C)	Fuse-Temp (°C)	Th (°C)	Tm (°C)	Ir (A)	Ur (V)	UL	cUL	PSE	VDE	TUV	CCC	KTL	RoHS
X0	76	73±2	53	200	3	250AC	●	●	●			●		●
X18	86	81±2	61	200	3	250AC	●	●	●	●		●	●	●
						60DC	●	●						●
X1	102	98±2	79	200	3	250AC	●	●	●	●		●	●	●
						60DC	●	●						
X2	115	111±2	91	200	3	250AC	●	●	●	●		●	●	●
						60DC	●	●						
X3	125	121±2	100	200	3	250AC	●	●	●			●		●
						60DC	●	●						
X4	130	125±2	106	200	3	250AC	●	●	●	●		●	●	●
X8	133	130±2	111	200	3	250AC	●	●	●	●		●	●	●
X5	135	130±2	111	200	3	250AC	●	●	●	●		●	●	●
X9	136	131±2	112	200	3	250AC	●	●	●	●		●	●	●
X6	145	140±2	121	200	3	250AC	●	●	●	●		●	●	●
X7	150	145±2	126	200	3	250AC	●	●	●	●		●	●	●
X16	160	154±2	135	200	3	250AC			●			●		●
X32	205	199±3	169	250	3	250AC	●	●			●	●	●	●
X31	221	218±2	188	250	3	250AC	●	●			●	●	●	●

Applications

- Motor
- Battery
- Transformer
- Power supplies
- Lamps and lanterns
- Home electrical appliances

Customized

Other temperatures can be customized such as: 85°C, 90°C, 92°C, 95°C, 97°C, 100°C, 103°C, 108°C, 117°C, 120°C, 127°C, And etc. The length of leadwires can be customized as required.

Packing Information

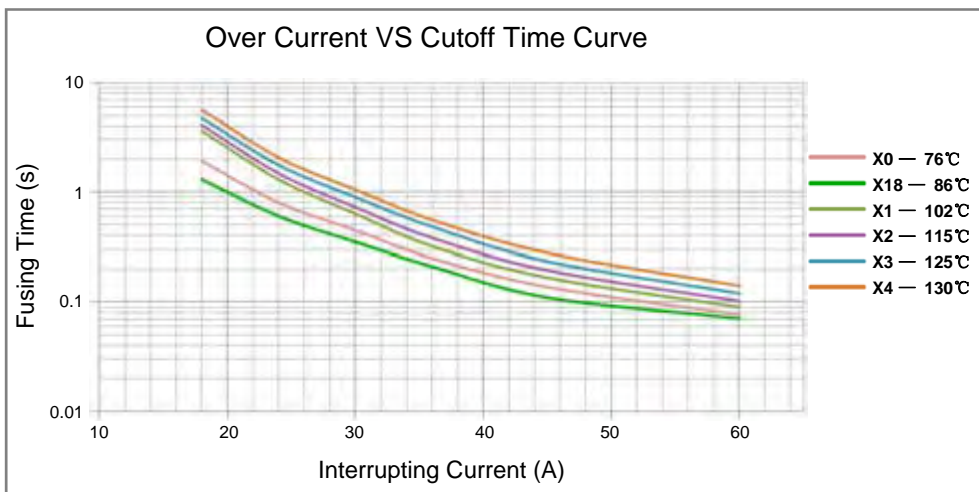
QTY: 50Kpcs/Carton
Carton Size: 44cm×30cm×26cm

Agency Approvals

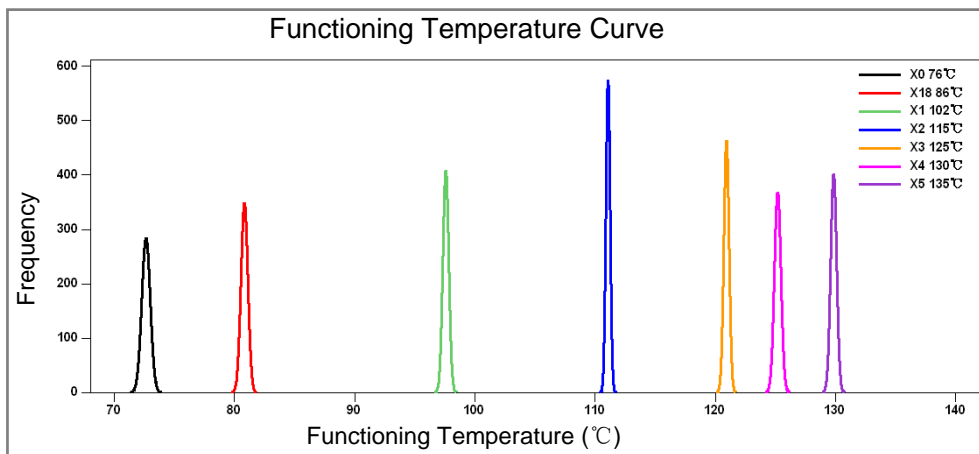
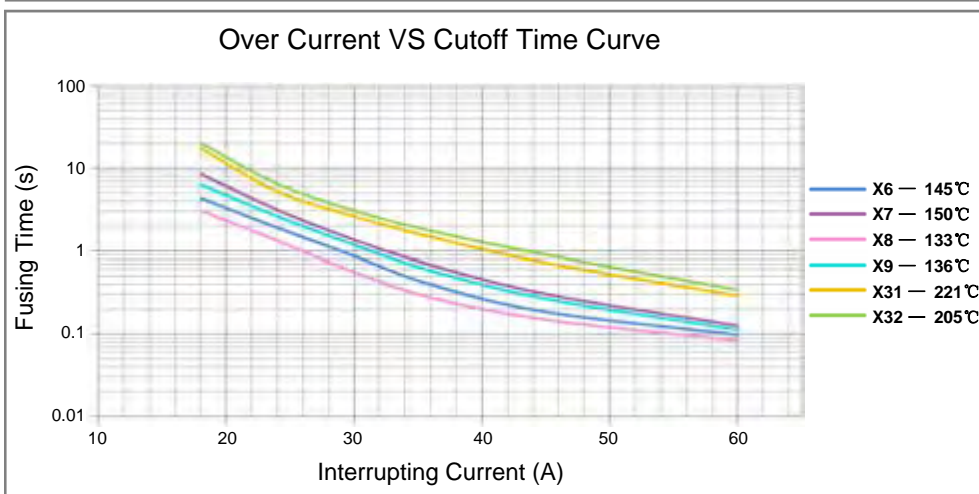
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- VDE: 40017055
- TUV: R50161779
- PSE: 09020139/40/41/42/43/44
- CCC: 2009010205346083
- KTL: SU05023-6001A/6003B
- RoHS & REACH Compliant



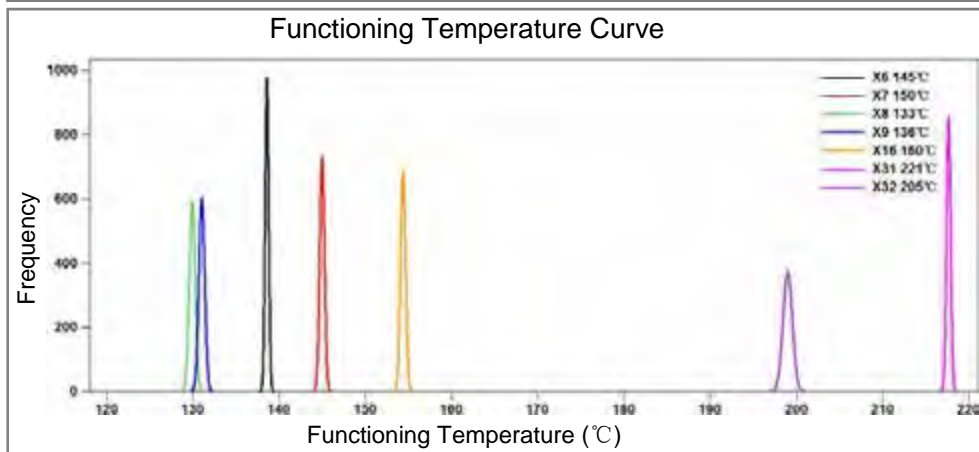
Performance Curve



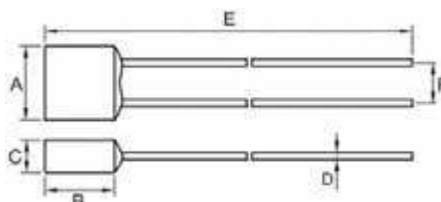
This is an illustrated curve for the model X series, describing the open time VS Multi-times rated current in the condition of the room temperature 25°C.
(This curve is for reference only)



This is an illustrated curve for the model X series, The temperature is measured with silicone oil bath of which temperature is increased at the rate of 0.5°C~1°C/ min, with a detection current up to 10mA as the only load.
(This curve is for reference only)



Frequency: Concentration ratio of real opening temperature measured in the preset conditions.



Dimensions (mm)

A	B	C	D(Φ)	E	F*
6.6±0.5	7.0±0.5	2.7±0.3	0.80±0.05	70±3	4.0±0.5

Note: The dimension F is measured from the root of leadwires.

Key Features **Specifications**

- Plastic case
- One-time over temperature protection
- Alloy type Thermal-link
- Environmental-friendly products

Model	Tf (°C)	Fuse-Temp (°C)	Th (°C)	Tm (°C)	Ir (A)	Ur (VAC)	In 8/20µs (15Times) (KA)	I _{max} 8/20µs (1Time) (KA)	UL	cUL	PSE	VDE	CCC	KTL	RoHS
Y0	76	73±2	53	200	5	250	2	4	●	●	●		●		●
Y18	86	81±2	61	200	5	250	2	4	●	●	●		●		●
Y1	102	98±2	77	200	5	250	3	6	●	●	●		●		●
Y2	115	111±2	89	200	5	250	3	6	●	●	●	●	●	●	●
Y3	125	121±2	98	200	5	250	3	6	●	●	●	●	●	●	●
Y4	130	125±2	103	200	5	250	3	6	●	●	●	●	●	●	●
Y8	133	130±2	108	200	5	250	3	6	●	●	●	●	●	●	●
Y9	136	131±2	111	200	5	250	3	6	●	●	●	●	●	●	●
Y6	145	140±2	118	200	5	250	3	6	●	●	●				●
Y7	150	145±2	123	200	5	250	3	6	●	●	●	●	●	●	●
Y16	160	154±2	133	200	5	250	3.5	7			●		●		●

Applications

- SPD
- Battery
- Transformer
- Power supplies
- Lamps and lanterns
- Home electrical appliances

Customized

Other temperatures can be customized such as:85°C,90°C,92°C, 95°C,97°C, 100°C,103°C,108°C, 117°C,120°C, 127°C.And etc. The length of leadwires can be customized as required.

Packing Information

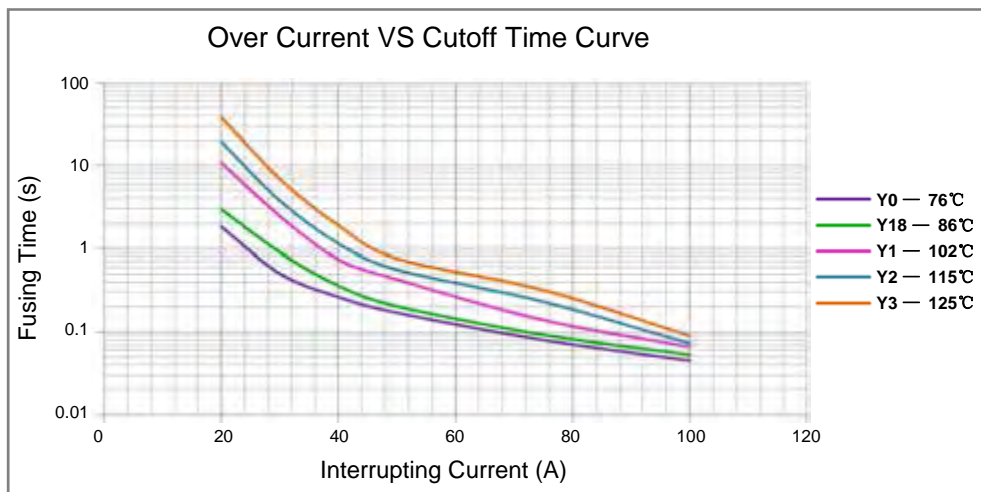
QTY:30Kpcs/Carton
Carton Size:4cmx30cmx26cm .

Agency Approvals

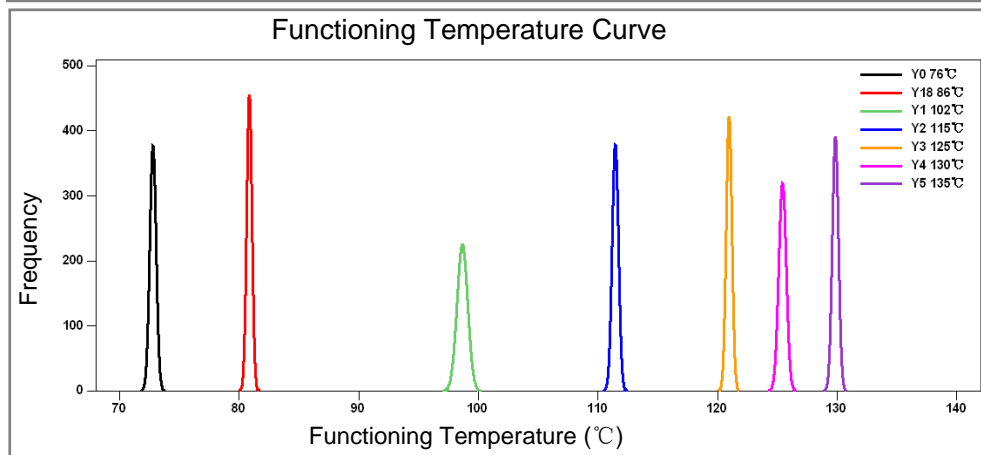
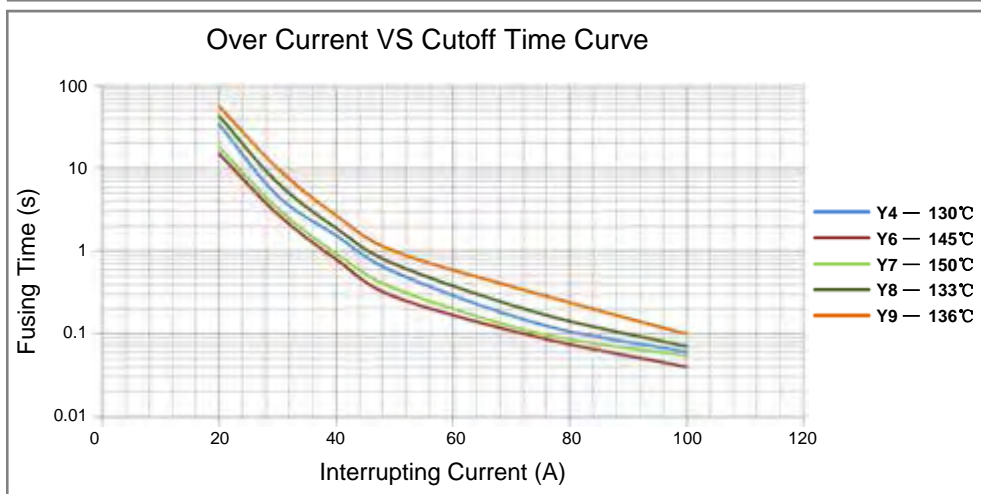
- UL/cUL: E214712
- VDE: 40017057
- PSE: 09020139/40/41/42/43/44
- CCC: 2009010205346082
- KTL: SU05023-6001A/6002A/6003B
- RoHS & REACH Compliant



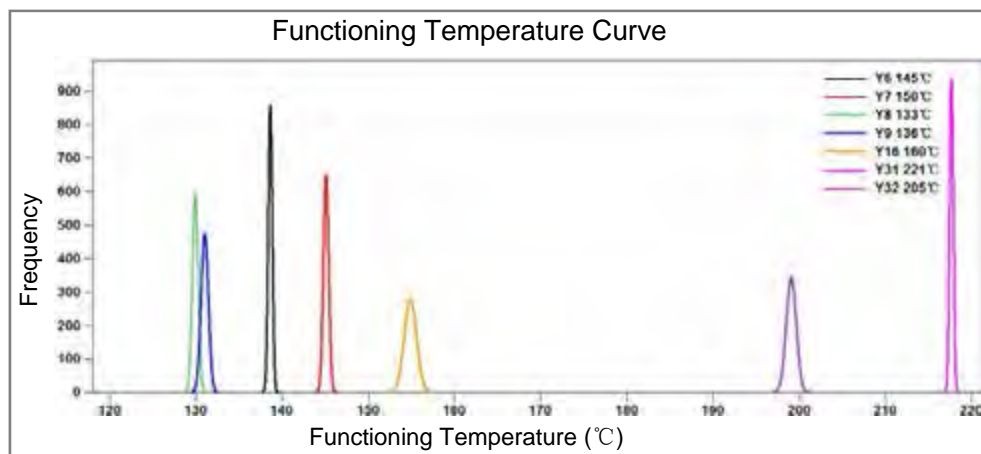
Performance Curve



This is an illustrated curve for the model Y series, describing the open time VS Multi-times rated current in the condition of the room temperature 25°C.
(This curve is for reference only)



This is an illustrated curve for the model Y series, The temperature is measured with silicone oil bath of which temperature is increased at the rate of 0.5°C~1°C/ min, with a detection current up to 10mA as the only load.
(This is curve for reference only)



Frequency: Concentration ratio of real opening temperature measured in the preset conditions.