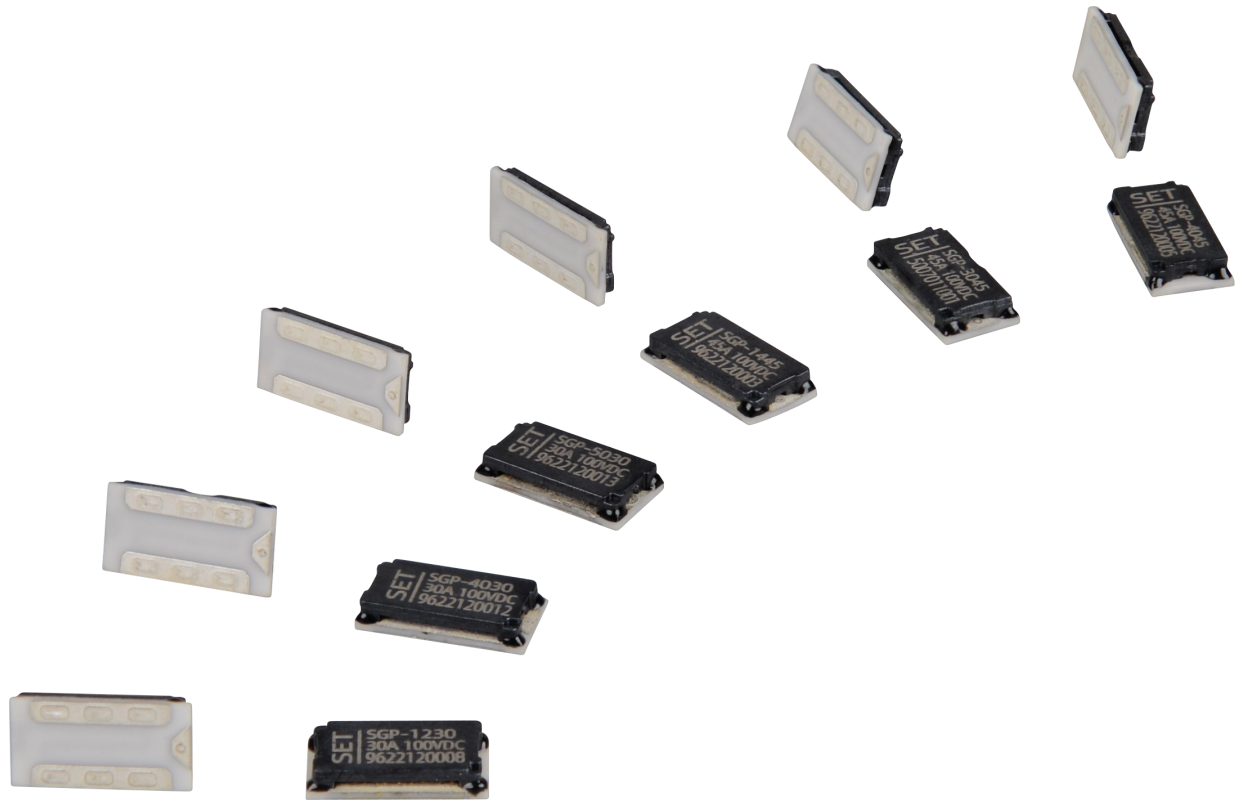

Features

- Low Impedance, Low Power Consumption
- Non-Resettable
- Surface Mount
- Overcurrent Protection
- Overcharging Protection
- RoHS & REACH Compliant
- Controlled Fusing Time ≤ 60 s
- Patented Product

TBP

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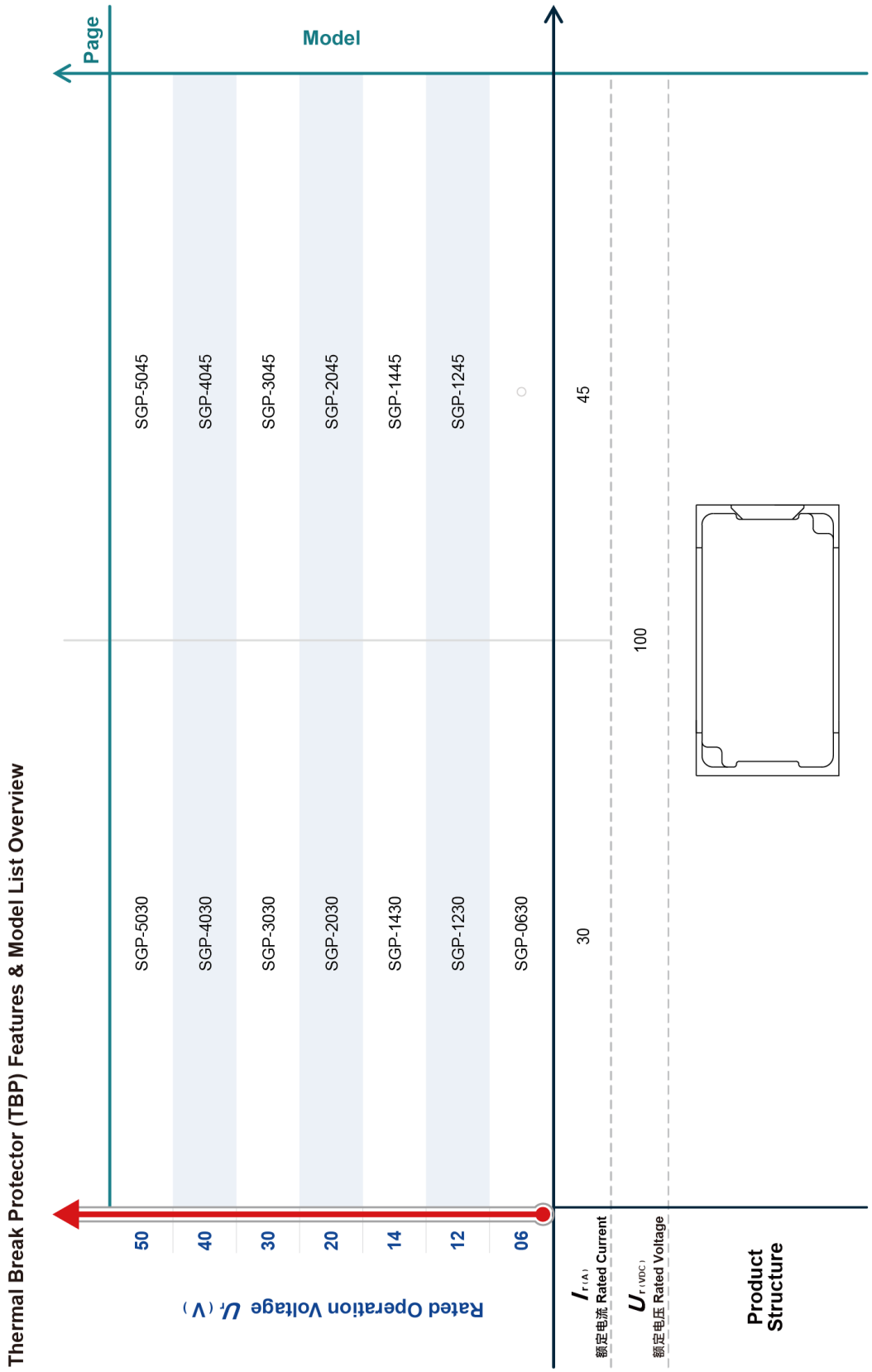
Thermal Break Protector (TBP) Features & Model List Overview



TBP

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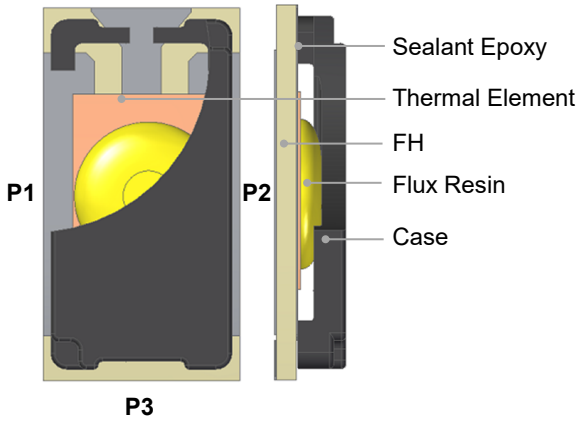
Description

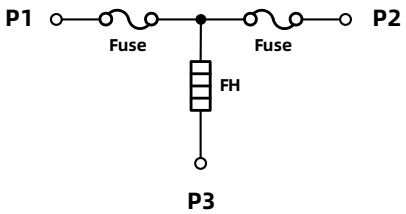
TBP is made up of Thermal Element, Flux Resin, FH, Case, Sealant Epoxy. In the charge/discharge loop, the addition of the thermal break protector (TBP) can provide secondary protection for the lithium-ion battery loop, and trigger the action in case of over-current or over-voltage, so as to reduce the risk of fire or explosion of lithium-ion battery.

SETsafe | SETfuse thermal break protector (TBP) cover rated current (30, 45) A, rated voltage (100VDC), Range of Operating Voltage (6.0 to 72.0) VDC, It complies with RoHS and REACH requirements.

Structure



Product Schematic



- P1 ~ P2 Main Circuit（MC）
- P1/P2 ~ P3 Control Circuit（CC）

TBP

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Part Number System

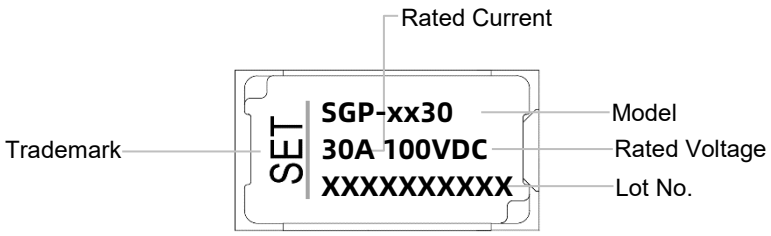
SGP - x x 3 0

Rated Current (A)

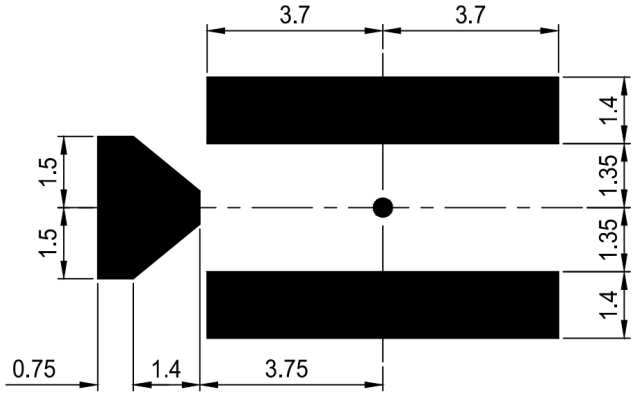
Rated Operating Voltage (VDC)
06、12、14、20、30、40、50

Series
SGP-xx30

Marking



Recommended Land Pattern



TBP

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Glossary

Item	Description
TBP	**Thermal Break Protector（TBP)** With Feed Heater , A Protector that turns on a Feed Heater to cut off circuit.
MC	**Main Circuit (MC)** All conductive components used in switching devices for closing or disconnecting circuits in a circuit.
CC	**Control Circuit (CC)** In addition to the main circuit, all conductive parts of the switching apparatus used in the access circuit as the closing operation and / or opening operation of the switching apparatus.
I_r	**Rated Current** The current used to classify an TBP, which is the Maximum current that TBP allows to carry and is able to cut off the circuit safely.
U_r	**Rated Voltage** The voltage used to classify an TBP, which is the Maximum voltage that TBP allows to carry and is able to cut off the circuit safely.
FH	**Feed Heater** Electric appliances that use electric energy to achieve heating effect.
Breaking Capacity	**Breaking Capacity** Value of prospective current that a fuse-link is capable of breaking at a stated voltage under prescribed conditions of use and behavior.
Range of Operation Voltage	**Range of Operation Voltage** Under specified conditions, the protector can operate normally to disconnect the voltage.

TBP

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ATTENTION

Usage

1. When atmosphere press is from 80 kPa to 106 kPa, the related altitude shall be from 2,000 meter to -500 meter.
2. Do not touch the TBP body or electrode lead directly when power is on, to avoid burning or electric shocking.
3. It is necessary to foresee there are possibilities that “Current carrying Capacity” and “Controlled Fusing Time” may be varied along with the condition change in the substrate thermal capacity，etc. Therefore you should check it on your PCB Generally，when thermal capacity of PCB increases，Current carrying capacity will increase accordingly and Clearing-time will be longer.
4. This product is designed and produced for only general-use of electronics devices. Therefore, we do not suppose that it is used for the applications [Military, Medical and so on] which may cause direct damages on life, bodies or properties of third party.

TBP

Installation

1. Patch type surface mounting.
2. Do not apply mechanical stress to the protection body during or after the installation.
3. Ultrasonic-cleaning or immersion-cleaning and so on must not be done to TBP before and after mounted. When cleaning is done, flux on element would flow, and it would not be satisfied its specification. Moreover, a similar influence happens when the product comes in contact with cleaning-solution. These products after cleaning will not be guaranteed.
4. Please do not re-use of the TBP removed by the solder correction.
5. Please avoid contacting TBP and resin-mold. The resin might infiltrate into the product, and it doesn’t meet the specification when the resin-mold is done to this product. These products after resin-mold will not be guaranteed.
6. Make sure that the terminals of this product are connected property on the land of circuit board, and the value falls in the rated heater resistance between Terminal P1 - P3 and P2 - P3.

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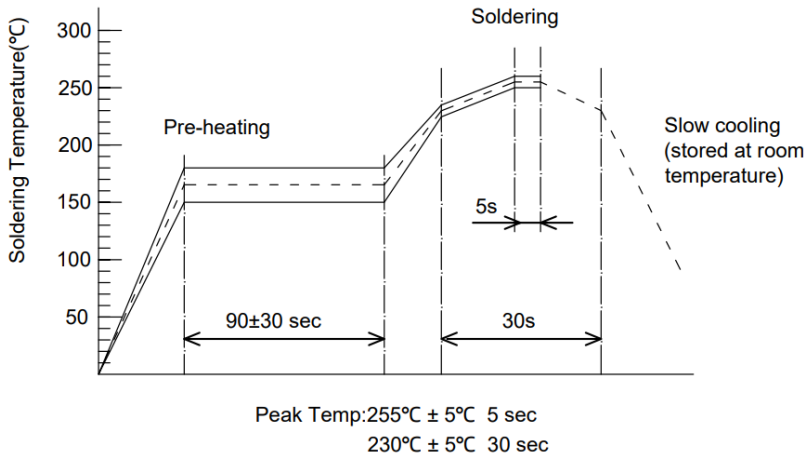
Soldering Parameters

1. Reflow Soldering Method (For Reference Only)



Peak Temp:255℃ ± 5℃ 5 sec
230℃ ± 5℃ 30 sec

2. Recommended Soldering Parameters
   Solder Iron Temp.:（300 ± 5）℃
   Soldering Time:≤ 3 s

Replacement

TBP is a non-repairable product. For safety aspect, it shall be replaced by an equivalent TBP, and mounted in the same way.

Storage

1. TBP must be stored in shaded area where it is not too dusty, with temp. (10 to 30) °C or less with no sudden temperature change, humidity within (30 to 70) % RH, and no corrosive gas in the air. please use them up within 1 year after receiving the goods.
2. This product's terminals use Ag plating. Ag terminals tend to easily get sulfurized or tarnished, please be cautious about their storage environment as follows.
   (1) Unopen packages also must be stored under the storage condition described in Storage Section 1.
   (2)After opening packages, products shall be sealed in a bag with high gas barrier property (e.g. aluminum laminated bag), and must be stored under the storage condition described in Storage Section 1.

TBP

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Patents

Name	Region	Category
A chip controlled fuse	China	Invention
A chip controlled fuse	China	Utility Model

TBP

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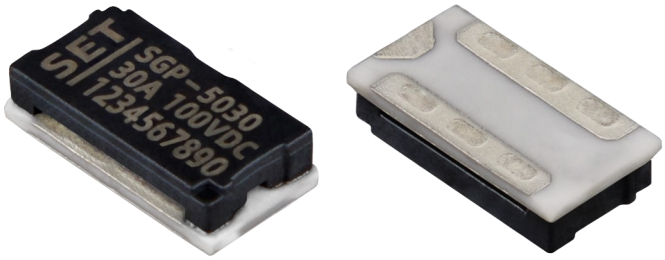
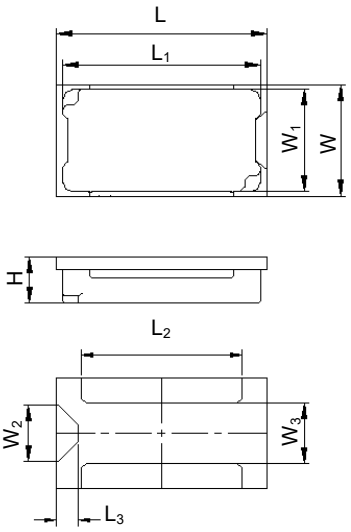
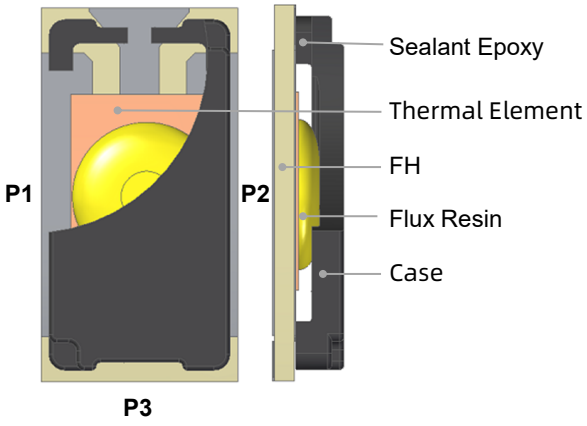
Dimensions (mm)





L	L_1	L_2	L_3	W	W_1	W_2	W_3	H
9.50 ± 0.30	8.90 ± 0.20	7.20 ± 0.20	1.00 ± 0.20	5.00 ± 0.30	4.60 ± 0.20	2.55 ± 0.20	2.40 ± 0.20	1.90 ± 0.20

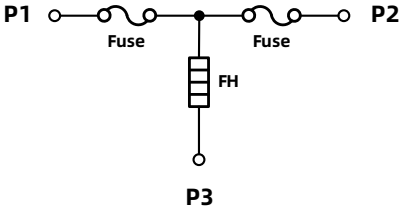
Structure Diagrams



Features

- Surface Mount
- Low Impedance, Low Power Consumption
- Controlled Fusing Time ≤ 60 s
- Non-Resettable
- Overcurrent Protection
- Overcharging Protection
- RoHS & REACH Compliant

Product Schematic



- P1 ~ P2 Main Circuit（MC）
- P1/P2 ~ P3 Control Circuit（CC）

Application

- Electric Tool
- Storage Battery
- Portable Power Supply
- Electric Motorcycle
- Electric Bicycle
- Household Energy Storage

TBP

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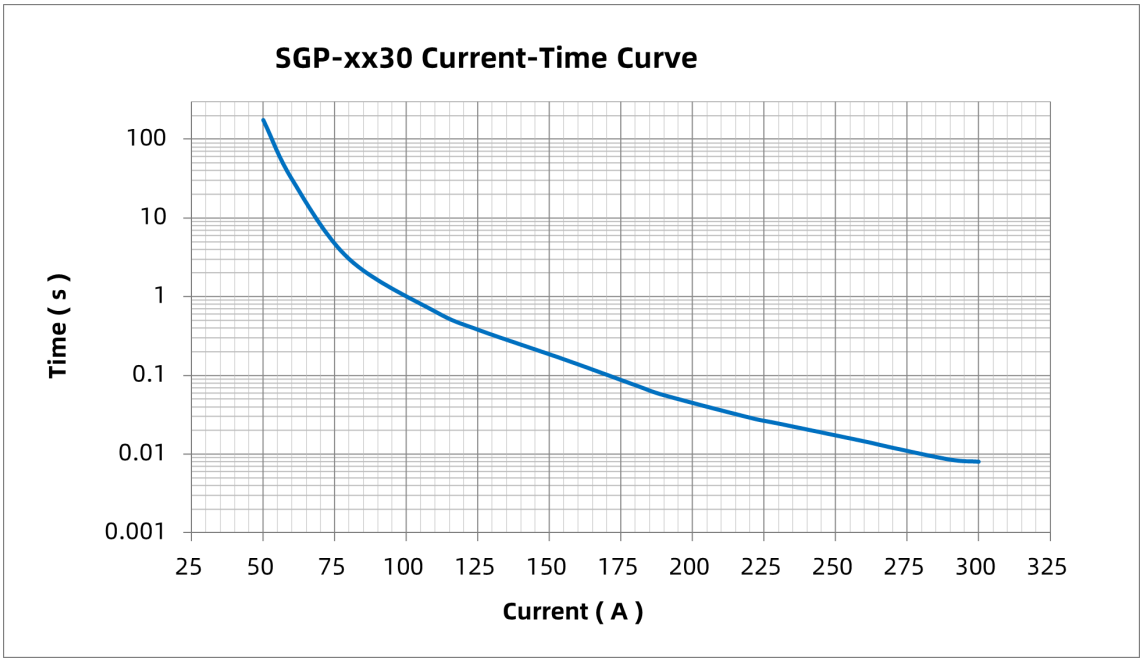
Specifications

Model	I_r	U_r	Cells in series	Breaking Capacity	Range of Operating Voltage	Resistance		Agency Mark		
						R_{Fuse}	R_{FH}			
	(A)	(VDC)	(Cells)	(A)	(VDC)	(mΩ)	(Ω)	UL	cUL	TUV
SGP-0630	30	100	2	80	6.0 ~ 9.6	≤ 2.0	0.6 ~ 1.3	•	•	•
SGP-1230	30	100	3	80	8.4 ~ 13.2	≤ 2.0	1.5 ~ 3.5	•	•	•
SGP-1430	30	100	4	80	11.1 ~ 18.4	≤ 2.0	2.8 ~ 4.5	•	•	•
SGP-2030	30	100	5	80	14.0 ~ 23.5	≤ 2.0	4.6 ~ 6.8	•	•	•
SGP-3030	30	100	6 ~ 7	80	20.2 ~ 31.5	≤ 2.0	8.5 ~ 15.0	•	•	•
SGP-4030	30	100	9 ~ 10	80	28.0 ~ 46.9	≤ 2.0	17.0 ~ 27.0	•	•	•
SGP-5030	30	100	12 ~ 17	80	39.6 ~ 72.0	≤ 2.0	38.0 ~ 65.0	•	•	•
Current Carrying Capacity	100% x I_r, no melting									
Current Fusing Time	200% x I_r the fusing time is < 1 min									
Controlled Fusing Time	In operation voltage range, the fusing time is <1min									
Endurance Test	100 A, power on 5 ms, power off 995 ms, 10,000 cycles									

Note: For P1-P2, please refer to the structure diagram.

Product Current-Time Curve (Reference)

The Current-Time curve shows functioning time at multi-times rated current at room temperature.



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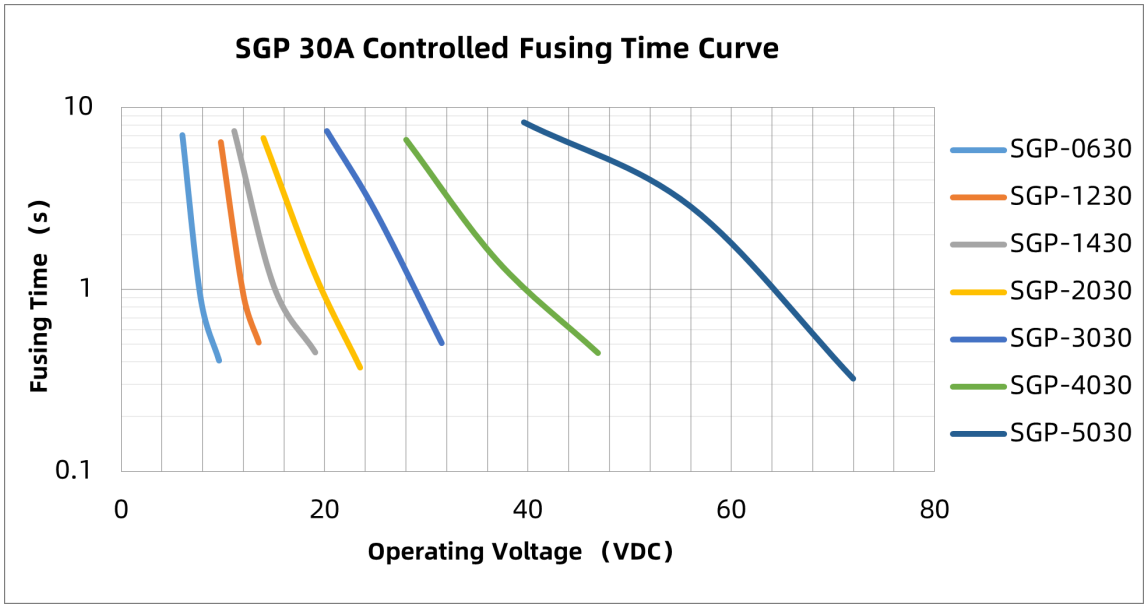
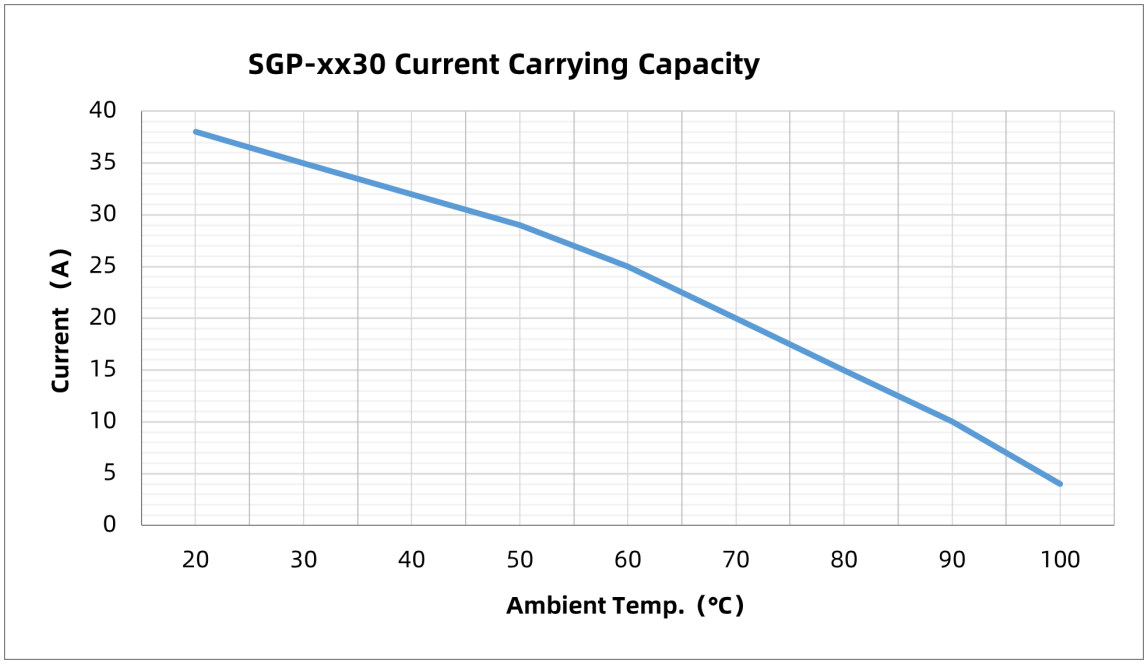
Controlled Fusing Time Curve (Reference)

The FH applies the operating voltage at room temperature, and collects the disconnection time of P1-P2.



Current Carrying Capacity (Reference)

Under different temperatures apply test current collect the surface temperature of the product to reach the set value.



TBP

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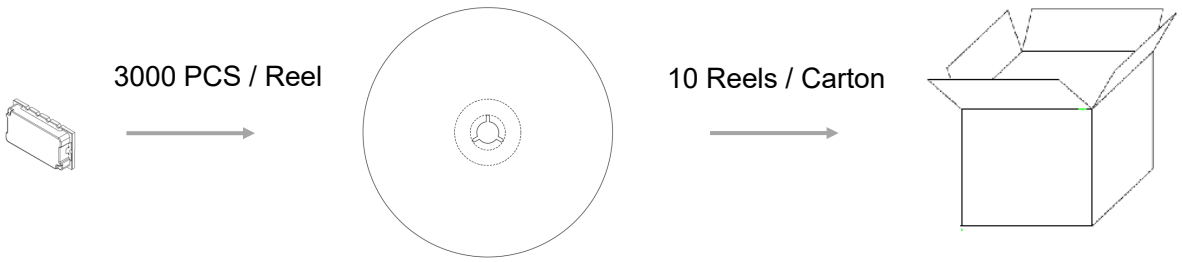
Packing Information

Item	Reel	Carton
Dimensions (mm)	Φ330 × 22.7	340 × 240 × 345
Quantity (PCS)	3000	30000
Gross Weight (kg)	11 ± 10 %	



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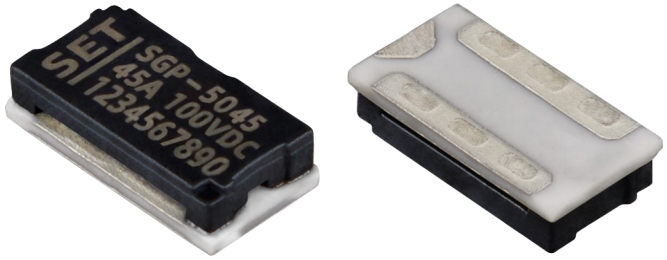
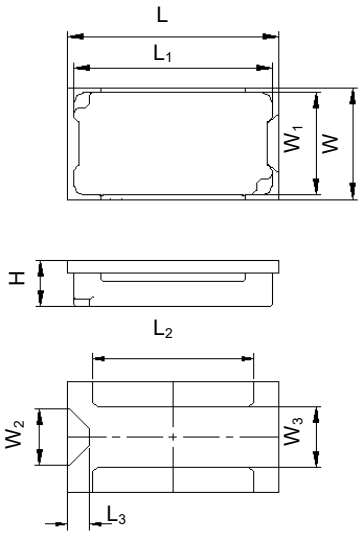
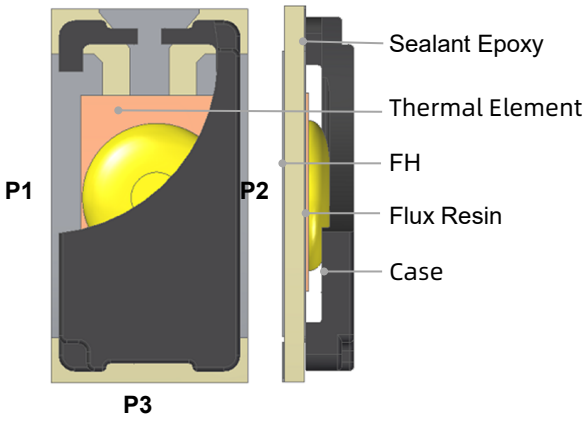
Dimensions (mm)





L	L_1	L_2	L_3	W	W_1	W_2	W_3	H
9.50 ± 0.30	8.90 ± 0.20	7.20 ± 0.20	1.00 ± 0.20	5.00 ± 0.30	4.60 ± 0.20	2.55 ± 0.20	2.40 ± 0.20	1.90 ± 0.20

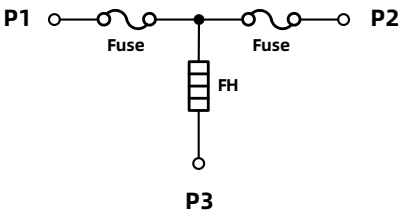
Structure Diagrams



Features

- Surface Mount
- Low Impedance, Low Power Consumption
- Controlled Fusing Time ≤ 60 s
- Non-Resettable
- Overcurrent Protection
- Overcharging Protection
- RoHS & REACH Compliant

Product Schematic



- P1 ~ P2 Main Circuit（MC）
- P1/P2 ~ P3 Control Circuit（CC）

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TBP

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Specifications

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	(A)	(VDC)	(Cells)	(A)	(VDC)	(mΩ)	(Ω)	UL	cUL	TUV
SGP-1245	45	100	3	120	9.8 ~ 13.5	≤ 1.6	1.6 ~ 3.5	•	•	•
SGP-1445	45	100	4	120	13.0 ~ 18.4	≤ 1.6	3.0 ~ 5.6	•	•	•
SGP-2045	45	100	5	120	16.7 ~ 23.5	≤ 1.6	4.6 ~ 9.0	•	•	•
SGP-3045	45	100	6 ~ 7	120	22.3 ~ 31.5	≤ 1.6	10.0 ~ 17.5	•	•	•
SGP-4045	45	100	9 ~ 10	120	33.0 ~ 46.9	≤ 1.6	22.0 ~ 37.0	•	•	•
SGP-5045	45	100	12 ~ 14	120	43.7 ~ 62.0	≤ 1.6	35.0 ~ 65.0	•	•	•
Current Carrying Capacity	100% x I_r, no melting									
Current Fusing Time	200% x I_r the fusing time is < 1 min									
Controlled Fusing Time	In operation voltage range, the fusing time is <1min									
Endurance Test	100 A, power on 5 ms, power off 995 ms, 10,000 cycles									

Note: For P1-P2, please refer to the structure diagram.

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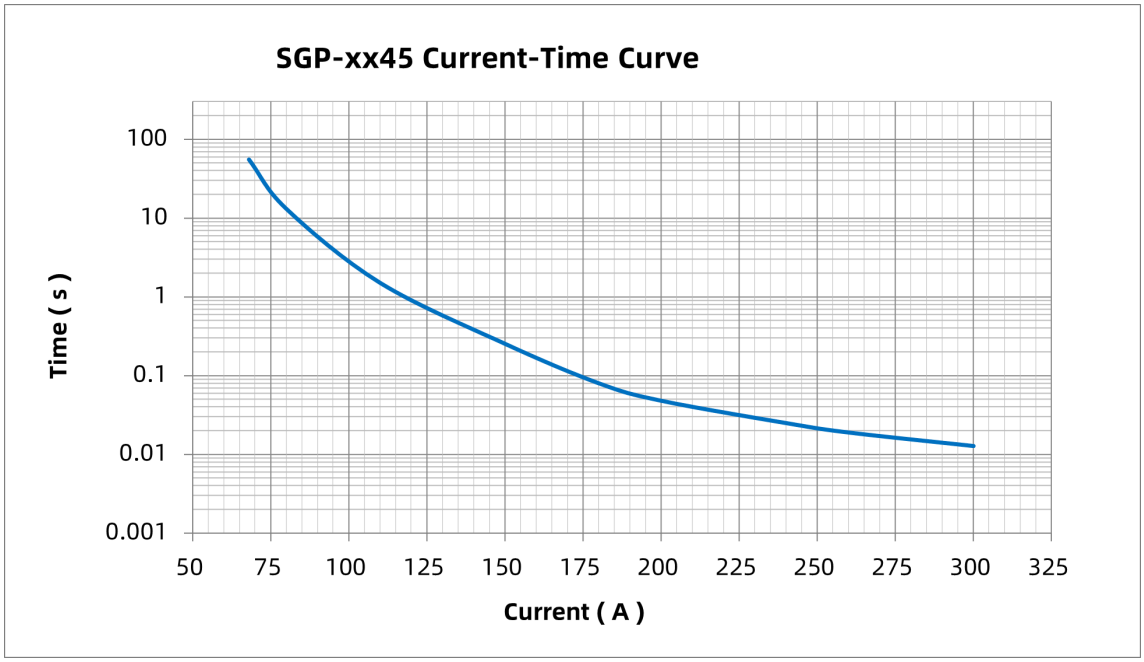

TBP

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Controlled Fusing Time Curve (Reference)

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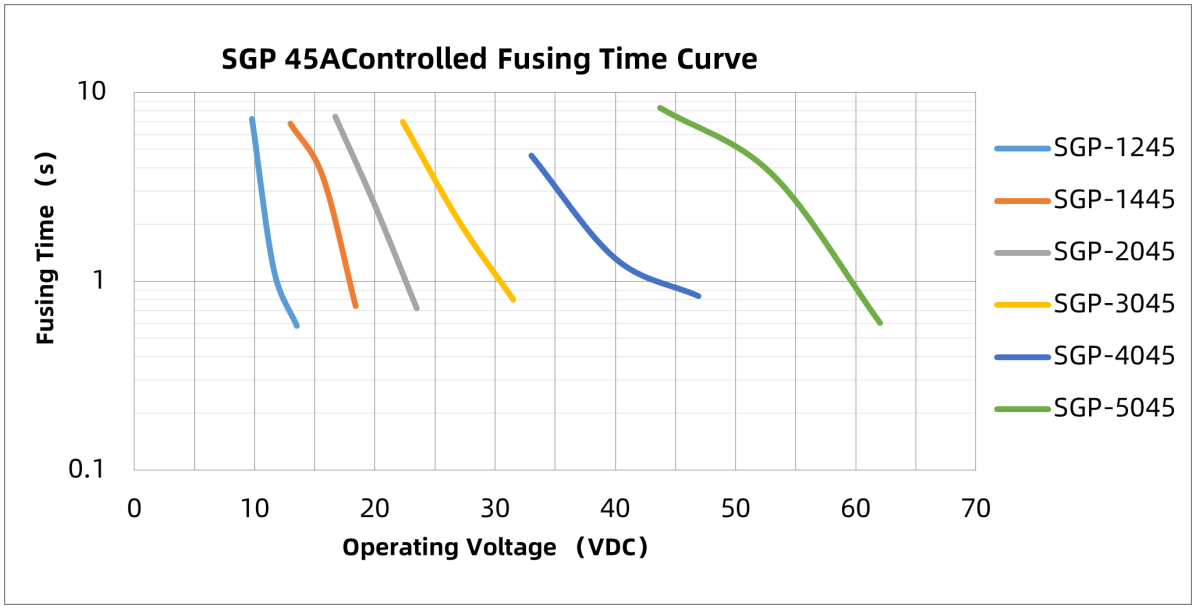

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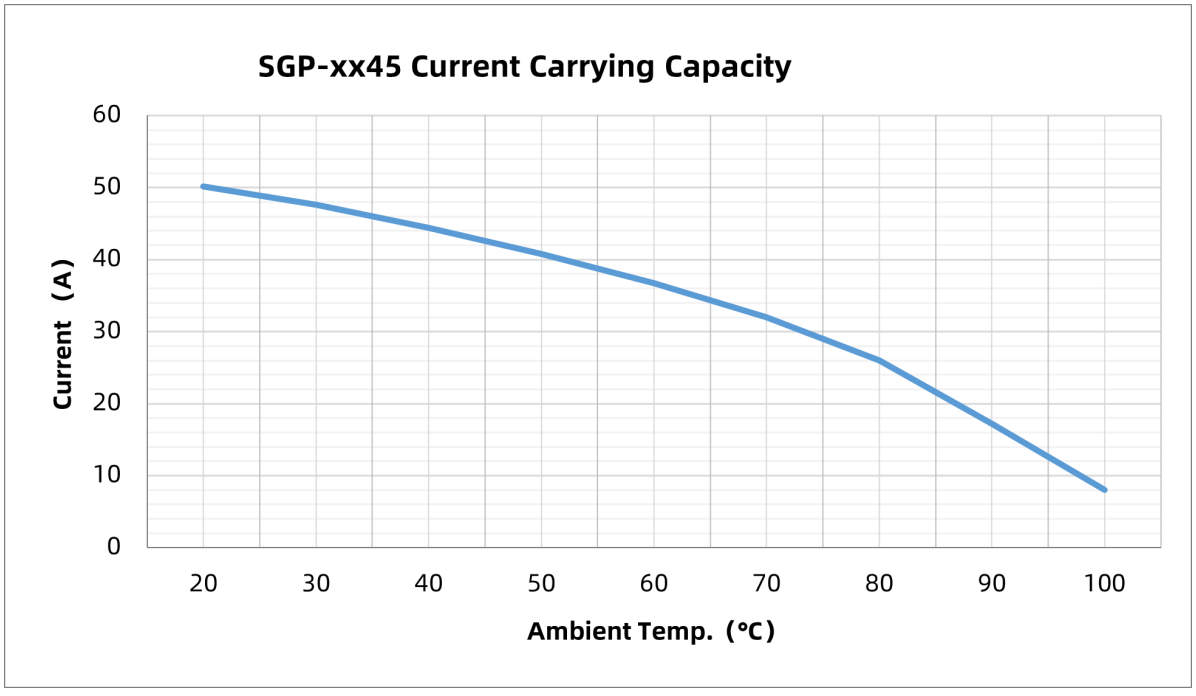

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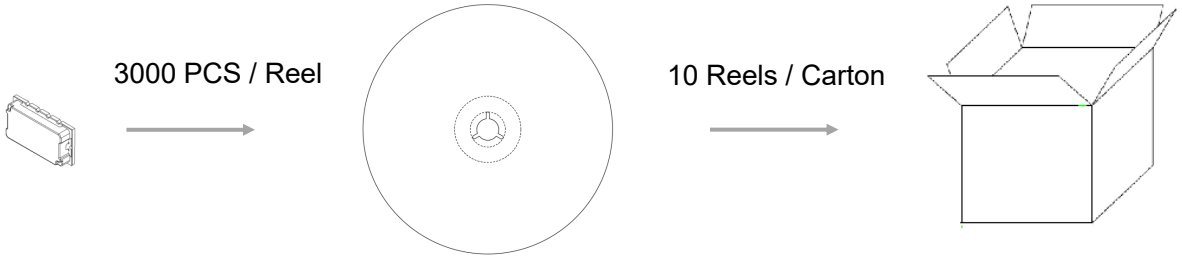
Quantity (PCS)	3000	30000
Gross Weight (kg)	11 ± 10 %	



TBP

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