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Please be sure to read the "Cautions" on pages 17 through 20 before using.

<table>
<thead>
<tr>
<th>Series</th>
<th>Rated Current/AC</th>
<th>Rated Functioning Temperature</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>SF/E</td>
<td>15/10A</td>
<td>73°C ~ 240°C</td>
<td>5</td>
</tr>
<tr>
<td>SF/K</td>
<td>6A</td>
<td>73°C ~ 216°C</td>
<td>7</td>
</tr>
<tr>
<td>SF/Y</td>
<td>15A</td>
<td>73°C ~ 240°C</td>
<td>7</td>
</tr>
<tr>
<td>SM/A</td>
<td>2A</td>
<td>76°C ~ 187°C</td>
<td>9</td>
</tr>
<tr>
<td>SM/B</td>
<td>1A</td>
<td>87°C ~ 151°C</td>
<td>9</td>
</tr>
<tr>
<td>SM/G</td>
<td>0.5A</td>
<td>100°C ~ 151°C</td>
<td>9</td>
</tr>
</tbody>
</table>

Select optimum series according to temperature and electrical ratings.

Safety standards

PSE (Japan)    UL (USA)    CSA (Canada)    VDE (Germany)    BEAB (UK)    CCC (China)
SEFUSE™ is a compact and reliable thermal cutoff designed to protect domestic electrical appliances and industrial electrical equipment from fire. Cutoff occurs and an electrical circuit opens when ambient temperature increases to an abnormal level.

Two SEFUSE types are available. The SF type uses an organic thermosensitive material as the thermal pellet and its operating temperature range is 73 °C to 240 °C. The SM type uses a fusible alloy and has an operating range of 76 °C to 187 °C.

SEFUSE is manufactured in Japan and Thailand, and both factories are certified by the International Standards Organization (ISO) for the ISO9001 quality standard.

### Features
- Excellently sensitive to ambient temperature.
- Stable and precise operation.
- One shot operation.
- Wide choice of types to suite the application. (SF or SM)
- SF types has ceramic pipe to protect sealing resin from the stress when bending the leads. (excluding SF/K type)
- Meets many safety standards.
- Eco-friendly products, meeting the Directive on WEEE(RoHS), are available.
  → For the SF types, the AgCuO is used as the material of sliding contact, and its patent has been registered in worldwide countries, such as USA and Europe.

### Applications
- Irons, hair dryers, heaters,
- Refrigerators, rice cookers, water pots, coffee makers
- Air conditioners, ventilation fans, electric fans, gas boilers
- Transformers, power suppliers, adaptors, solenoids
- Chargers, battery packs, Air conditioner for Automobile
- Copiers, laser beam printers, power taps

For the purpose of photography, the insulation tube of the thermal cutoff has been removed. In reality, the thermal cutoff is covered by the insulation tube.
The SF type contains a sliding contact, springs, and a thermal pellet inside a metal case. When spring B is compressed, firm contact between lead A and the sliding contact occurs. At normal temperatures, current flows from lead A to the sliding contact and then through the metal case to lead B.

When the ambient temperature rises to the SEFUSE operating temperature, the heat transferred through the metal case melts the thermal pellet. When the thermal pellet melts, springs A and B expand, moving the sliding contact away from lead A. The electrical circuit is opened by breaking contact between the sliding contact and lead A.

*Not using for SF/K series.
The SM type uses a fusible alloy inside a ceramic case. It has a cutoff (rated) current of 0.5 A to 2.0 A (AC). Because of its insulated case, the SM type can be attached directly where temperature detection is required.

In the SM type, leads are connected by a fusible alloy. The current flows directly from one lead to the other. The fusible alloy is coated with a special flux.

When ambient temperature rises to the SEFUSE operating temperature, the fusible alloy melts and condenses into a drop around the end of each lead because of surface tension and the coating of special flux. The electrical circuit then opens.
Standard Ratings

SF/E Series

■ Dimension (Unit:mm)

Note: The dimensions for long lead devices are in parentheses.

■ Marking 1 (SF70E~SF129E)

SEFUSE
SF 70E
PSE
JET
250V~

Brand Name
Part Number
Rated Functioning Temperature
Rated Current
Rated Voltage
Lot Number

Factory Code:
0365

* Factory Code represents the factory location as shown below
  Japan: none
  Thailand: C

■ Marking 2 (SF139E~SF240E)

SEFUSE
SF188E-1
PSE
JET
250V~

Brand Name
Part Number
Rated Functioning Temperature
Rated Current
Rated Voltage
Lot Number

Factory Code:
0365

How to read a lot number

03 6 5

03 Month
6 Sub-lot number
5 Last two digit of year

X·····October
Y·····November
Z·····December

Note:
The dimensions for long lead devices are in parentheses.

SF/E Series

SF type

SEFUSE™

Note:
The dimensions for long lead devices are in parentheses.

SF type

SEFUSE™

Note:
The dimensions for long lead devices are in parentheses.

SF type

SEFUSE™

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SEFUSE™

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SEFUSE™

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SF type

SEFUSE™

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SF type

SEFUSE™

Note:
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SF type

SEFUSE™

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SF type

SEFUSE™

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SEFUSE™

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SF type

SEFUSE™

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The dimensions for long lead devices are in parentheses.

SF type

SEFUSE™

Note:
The dimensions for long lead devices are in parentheses.

SF type

SEFUSE™

Note:
### Ratings

<table>
<thead>
<tr>
<th>Meet for WEEE (RoHS)</th>
<th>Part Number</th>
<th>Rated Functioning Temperature $T_f$ (°C)</th>
<th>Operating Temperature $T_{o}$ (°C)</th>
<th>$T_{m}$ ($°C$)</th>
<th>Rated Current</th>
<th>Rated Voltage</th>
<th>UL</th>
<th>CSA</th>
<th>VDE</th>
<th>BEAB</th>
<th>CCC</th>
<th>PSE</th>
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<tbody>
<tr>
<td>○ SF 70E</td>
<td>73</td>
<td>70 ± 2</td>
<td>58</td>
<td>150</td>
<td>4)</td>
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<td>AC250V</td>
<td>217780 (LR52330)</td>
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<td>-0002</td>
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<td>76 ± 1</td>
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<td>91 ± 0</td>
<td>79</td>
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<td>1012</td>
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<td>150</td>
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<td>159</td>
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<td>1016</td>
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<td>○ SF152E</td>
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<td>172</td>
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<td>○ SF169E</td>
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<td>189</td>
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<td>174</td>
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<td>○ SF188E</td>
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<td>○ SF214E</td>
<td>216</td>
<td>214 ± 1</td>
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<td>1021</td>
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<td>○ SF226E</td>
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<td>226 ± 1</td>
<td>210</td>
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<td>○ SF240E</td>
<td>240</td>
<td>237 ± 2</td>
<td>260</td>
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<td></td>
<td></td>
<td>1023</td>
</tr>
</tbody>
</table>

Note: 1) ○: No use the hazardous substances prescribed by WEEE (RoHS).
2) Part numbers are for standard lead devices. For long leads, add the number "1" at the end of part number.
3) $T_m$ of SF188E, SF214E, SF226E, SF240E are as follows.
4) The electrical ratings by safety standards are as follows.

#### 4) The electrical ratings by safety standards are as follows.

<table>
<thead>
<tr>
<th>Rated Voltage</th>
<th>UL</th>
<th>CSA</th>
<th>VDE</th>
<th>BEAB</th>
<th>CCC</th>
<th>PSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC120V</td>
<td>15A (Inductive) (Resistive)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>20A (Resistive)</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AC240V</td>
<td>15A (Resistive)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>AC250V</td>
<td>10A (Resistive)</td>
<td>15A (Inductive) (Resistive)</td>
<td>15A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>17A (Resistive)</td>
<td></td>
<td></td>
<td>15A</td>
<td></td>
<td>15A</td>
</tr>
<tr>
<td>AC277V</td>
<td>15A (Resistive)</td>
<td></td>
<td></td>
<td>15A</td>
<td></td>
<td>15A</td>
</tr>
</tbody>
</table>

5) SF169E, SF184E, SF188E, SF214E, SF226E and SF240E has a recognition of CH rating by UL.
6) The number in parentheses are previous number. Both number can be inquired.
7) The products indicated in *3 and *4 mention a certified number by the former law, the Electrical Appliance Material Control Law, as a transitional measure to the current law, the Electrical Appliance and Material Safety Law of Japan.
## Standard Ratings

### SF/K Series

#### Dimension (Unit:mm)

- **Marking 1 (SF70K~SF119K)**
  - SEFUSE SF 70K
  - 73°C
  - 6A
  - 250V~
  - <PS>E JET
  - 0365

- **Marking 2 (SF188K,SF214K)**
  - SEFUSE SF 188K
  - 192°C
  - 6A
  - 250V~
  - <PS>E JET
  - 0365

### SF/Y Series

#### Dimension (Unit:mm)

- **Marking 1 (SF70Y~SF129Y)**
  - SEFUSE SF 70Y
  - 73°C
  - 15A
  - 250V~
  - JET
  - 0365

- **Marking 2 (SF139Y~SF240Y)**
  - SEFUSE SF 139Y
  - 192°C
  - 15A
  - 250V~
  - JET
  - 0365

---

**Note:** The dimensions for long lead devices are in parentheses.
### Ratings

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Rated Functioning Temperature (°C)</th>
<th>Operating Temperature (°C)</th>
<th>Th (°C)</th>
<th>Tm (°C)</th>
<th>Rated Current</th>
<th>Rated Voltage</th>
<th>U L</th>
<th>VDE</th>
<th>BEAB</th>
</tr>
</thead>
<tbody>
<tr>
<td>SF 70K</td>
<td>73</td>
<td>70 ± 2</td>
<td>45</td>
<td>150</td>
<td>6A (Resistive)</td>
<td>AC250V</td>
<td>E71747</td>
<td>677802-1171-0006</td>
<td>1008</td>
</tr>
<tr>
<td>SF 76K</td>
<td>77</td>
<td>76 ± 1</td>
<td>51</td>
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<td></td>
</tr>
<tr>
<td>SF 91K</td>
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<td>91 ± 1</td>
<td>66</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>SF 96K</td>
<td>99</td>
<td>96 ± 2</td>
<td>71</td>
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<tr>
<td>SF214K</td>
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<td>214 ± 1</td>
<td>198</td>
<td></td>
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</tr>
</tbody>
</table>

Note: 1) ○ : No use the hazardous substances prescribed by WEEE(RoHS).  
2) The following recognition is approved by UL and VDE.  
3) SF188K and SF214K has a recognition of CH rating by UL.  
4) The products indicated in **1** mention a certified number by the former law, the Electrical Appliance Material Control Law, as a transitional measure to the current law, the Electrical Appliance and Material Safety Law of Japan.  

This series are made only in Japan.

### Ratings

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Rated Functioning Temperature</th>
<th>Operating Temperature</th>
<th>Rated Current</th>
<th>Rated Voltage</th>
<th>U L</th>
<th>CCC</th>
<th>PSE (JET1975-32001-XXXX)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SF 70Y</td>
<td>73°C</td>
<td>70 ± 2°C</td>
<td>15A</td>
<td>AC250V</td>
<td></td>
<td></td>
<td>E71747</td>
</tr>
<tr>
<td>SF 76Y</td>
<td>77°C</td>
<td>76 ± 1°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>E71747</td>
</tr>
<tr>
<td>SF 91Y</td>
<td>94°C</td>
<td>91 ± 1°C</td>
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<td>E71747</td>
</tr>
<tr>
<td>SF 96Y</td>
<td>99°C</td>
<td>96 ± 2°C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>E71747</td>
</tr>
<tr>
<td>SF119Y</td>
<td>121°C</td>
<td>119 ± 2°C</td>
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<td>E71747</td>
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<tr>
<td>SF129Y</td>
<td>133°C</td>
<td>129 ± 2°C</td>
<td></td>
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</tr>
<tr>
<td>SF214Y</td>
<td>216°C</td>
<td>214 ± 1°C</td>
<td></td>
<td></td>
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<td>E71747</td>
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<td>E71747</td>
</tr>
</tbody>
</table>

Note: 1) ○ : No use the hazardous substances prescribed by WEEE(RoHS).  
2) Part numbers are for standard lead devices. For long leads, add the number "-1" at the end of part number.  
3) The products indicated in **1** mention a certified number by the former law, the Electrical Appliance Material Control Law, as a transitional measure to the current law, the Electrical Appliance and Material Safety Law of Japan.  

This series are made only in Japan.
## Standard Ratings

### SM/A Series

**Dimension (Unit:mm)**

<table>
<thead>
<tr>
<th>Component</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>38(68) ±3.0</td>
</tr>
<tr>
<td>Width</td>
<td>9 ±0.3</td>
</tr>
<tr>
<td>Height</td>
<td>85(145) ±3.0</td>
</tr>
</tbody>
</table>

Note: The dimensions for long lead devices are in parentheses.

**Marking**

- **Rated Functioning Temperature**: 115°C
- **Rated Current**: 2A
- **Rated Voltage**: 250V
- **Lot Number**
- **Inspector Name**
- **PSE Mark**
- **Factory Code**
- **Brand Name**: SEFUSE
- **Part Number**: SM110A0

* Factory Code represents the factory location as shown below:
  - Japan: none
  - Thailand: C

**How to read a lot number**

- **Month**
  - X: October
  - Y: November
  - Z: December
- **Sub-lot number**
- **Last one digit of year**

### SM/B Series

**Dimension (Unit:mm)**

<table>
<thead>
<tr>
<th>Component</th>
<th>Measurement</th>
</tr>
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<tbody>
<tr>
<td>Length</td>
<td>39.5(69.5) ±3.0</td>
</tr>
<tr>
<td>Width</td>
<td>6 ±0.3</td>
</tr>
<tr>
<td>Height</td>
<td>85(145) ±3.0</td>
</tr>
</tbody>
</table>

Note: The dimensions for long lead devices are in parentheses.

**Marking**

- **Rated Functioning Temperature**: 115°C
- **Rated Current**: 1A
- **Rated Voltage**: 250V
- **Lot Number**
- **Inspector Name**
- **PSE Mark**
- **Factory Code**
- **Brand Name**: SEFUSE
- **Part Number**: SM110B0

* Factory Code represents the factory location as shown below:
  - Japan: none
  - Thailand: C

**How to read a lot number**

- **Month**
  - X: October
  - Y: November
  - Z: December
- **Sub-lot number**
- **Last one digit of year**

### SM/G Series

**Dimension (Unit:mm)**

<table>
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<tr>
<td>Width</td>
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<tr>
<td>Height</td>
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</tbody>
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Note: The dimensions for long lead devices are in parentheses.

**Marking**

- **Rated Functioning Temperature**: 115°C
- **Rated Current**: 0.5A
- **Rated Voltage**: 250V
- **Lot Number**
- **PSE Mark**
- **Part Number**
- **Brand Name**: SEFUSE
- **Rated Current**: 110G0 0.5A

**How to read a lot number**

- **Month**
  - X: October
  - Y: November
  - Z: December
- **Sub-lot number**
- **Last one digit of year**
### Ratings

<table>
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<tr>
<th>Meet for WEEE (RoHS)</th>
<th>Part Number</th>
<th>Rated Functioning Temperature Tl (°C)</th>
<th>Operating Temperature Tm (°C)</th>
<th>Th Tc (°C)</th>
<th>Tm (°C)</th>
<th>Electrical Ratings</th>
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Note: 1) ○ No use the hazardous substances prescribed by WEEE(RoHS).
2) Part numbers are for standard devices. For long leads, change the last number from 0 to 1.
3) DC rating are approved by UL and VDE.
4) The number in parentheses are previous number. Both number can be inquired.
5) The products indicated in *3 mention a certified number by the former law, the Electrical Appliance and Material Safety Law of Japan.
6) Rated Functioning Temperature Tl: Min. 70° C

### Ratings

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Performance Data
SF/E Series · SF/K Series · SF/Y Series

- Temperature Rise
- Response Time

**SF/E Series**

- Temperature Rise
- Response Time

**SF/K Series**

- Temperature Rise
- Response Time

**SF/Y Series**

- Temperature Rise
- Response Time

**SM/A Series**

- Temperature Rise
- Response Time
### Internal Resistance and initial operating temperature

<table>
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<th>Internal Resistance (mΩ/25mm)</th>
<th>Operating Temperature (°C)</th>
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**Legend:**
- **Internal Resistance**
- **Initial Operating Temperature**
Performance Data

SM/B Series

**Temperature Rise**

![Temperature Rise Graph for SM/B Series](image)

**Response Time**

![Response Time Graph for SM/B Series](image)

SM/G Series

**Temperature Rise**

![Temperature Rise Graph for SM/G Series](image)

**Response Time**

![Response Time Graph for SM/G Series](image)
### Internal Resistance and initial operating temperature

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### Internal Resistance and initial operating temperature

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Internal Resistance (mΩ/25mm)</th>
<th>Operating Temperature (°C)</th>
<th>Part Number</th>
<th>Internal Resistance (mΩ/25mm)</th>
<th>Operating Temperature (°C)</th>
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</table>
**Definition of Terms**

- **Rated Functioning Temperature**
  Rated functioning temperature is the operating temperature of thermal cutoffs, measured using the method specified in the safety standard. In present PSE (Electrical Appliance and Material safety Law) of Japan, the operation should be within the specified operating temperature range of ±7 °C. In various standards such as UL, CSA, VDE, BEAB and CCC which comply with the IEC standard, it is called the rated functioning temperature, and should operate within the prescribed temperature range of +0 / -10 °C.
  It is represented by the symbol Tf in the UL, CSA, VDE, BEAB and CCC standards.
  In SEFUSE, a temperature that complies with both standards is set as the rated functioning temperature, and is indicated on the body of the thermal cutoff.

- **Operating Temperature**
  Operating temperature is the actual operating temperature range when the thermal cutoff is made to operate inside a constant temperature oven whose temperature is raised at the rate of 0.5 to 1 °C/min. while a detection current of 10 mA or lower is applied.
  The operating temperature is a standard set by ourself and is not specified by a safety standard.

- **Th, Tc (Holding Temperature)**
  Holding temperature is the maximum temperature at which, when applying a rated current to the thermal cutoff, the state of conductivity is not changed during specified time not less than 168 hours (1 week).
  It is represented by the symbol Th in the UL and CSA standard, Tc in the VDE, BEAB and CCC standard as an option.

- **Tm (Maximum Temperature Limit)**
  Maximum temperature limit is the temperature up to which thermal cutoffs will not change its state of cutoff without impairing.
  It is represented by the symbol Tm in the UL, CSA, VDE, BEAB and CCC standards.
Lead Cutting and Taping

The following lead cutting and taping are available as your request.

### Applicable Products

<table>
<thead>
<tr>
<th>Standard lead type</th>
<th>Long lead type</th>
</tr>
</thead>
<tbody>
<tr>
<td>SF/E</td>
<td>SF/K</td>
</tr>
<tr>
<td>Taping</td>
<td>—</td>
</tr>
<tr>
<td>Lead Cutting</td>
<td>○</td>
</tr>
<tr>
<td>Lead Forming</td>
<td>○</td>
</tr>
</tbody>
</table>

### Taping

- SF Type
- SM Type
- For more information on dimensions not described in diagrams above, please contact us.

### Lead Cutting

- SF Type
  - L₁ : 9 ~ 32 (mm)
  - L₂ : 7 ~ 33 (mm)

- SM Type
  - L₁, L₂ : 9 ~ 35 (mm)

### Lead Forming

- A : Should be over 5 mm

For more information on dimensions not described in diagrams above, please contact us.
Cautions

This section describes cautions designed to protect the performance of the thermal cutoff. Be sure to read and fully understand these cautions.

To obtain full performance from the thermal cutoff, it is necessary for the customer to appropriately store the thermal cutoff, design appropriate circuits for the application, and perform evaluations, mounting and testing as necessary. Problems arising from the inappropriate execution of the above are the responsibility of the customer, and we declines any and all responsibility.

Design

Do not use this device for and purpose other than as a thermal cutoff.
The thermal cutoff is designed to detect abnormal rises in temperature and break circuits if needed. It is not a current fuse that cuts excess current. If used as a current fuse, the SEFUSE may malfunction.

Do not use this device in aerospace equipment, aeronautical equipment, nuclear reactor control systems, life support equipment or systems, transportation machinery engine control or safety-related equipment.
This device is designed for use in household electric appliance, office automation equipment, audio and video equipment, computer communications equipment, test and measurement equipment, personal electronic equipment and transportation equipment (excluding engine control).

The customer should select the proper thermal cutoff device, mounting location, and mounting method as appropriate for each application.
Verify whether the chosen selections are appropriate by repeatedly testing the final design for thermal cutoff under normal conditions as well as under predicted maximum abnormal conditions.

Mount the SEFUSE so that it can detect abnormal heat as quick as possible.
The thermal cutoff operates when the inside thermal element melts. Therefore, if the inside thermal element does not reach the operating temperature, the thermal cutoff does not operate, even if the ambient temperature rises to the operating temperature. When the ambient temperature rises suddenly or detect heat partially, it may take time till the SEFUSE operates.

Mount the SEFUSE so that the temperature of every part become to equal.
If the SF-type lead B, which is caulked to the metal case, is mounted so that it only conducts heat to the body, the temperature around the thermal pellet can be always higher than the other places in the metal case, which can cause the SEFUSE to early open. Be sure to connect the lead A, the resin-sealed side, to the heat source.
Mounting the SEFUSE so that the temperature of the lead A is always lower than that of the lead B can also cause the SEFUSE to early open.
Make designs so that the temperature of the body of the thermal cutoff does not exceed the temperatures shown in Table 1.

If the temperature is exceeded on a regular basis, the thermal cutoff may start operating only at temperature lower than the normal operating temperature. Malfunctions may also occur. Even if the thermal cutoff's operating temperature is exceeded, it may malfunction.

The SEFUSE has a limited life.

Although the thermal elements are made of durable substances for the long time using, their lifetime varies, depending on using conditions. Especially, the more often the SEFUSE are used at the temperature nearly to the operating temperature, the lifetime may be short. Therefore, we recommend performing a reliability test, with the SEFUSE mounted to the actual application, or under the almost same conditions as the actual ones, and confirming that there is no problem with the lifetime.

The body temperature of the thermal cutoff becomes higher as current passes through.

The body temperature of the thermal cutoff becomes higher as current passes through and might rise higher than the ambient operating temperature (see test data). The temperature may rise even higher depending on the mounting method and other conditions. Therefore, after mounting the thermal cutoff under the same conditions you would use for the actual application, work the final product and measure the body temperature of the thermal cutoff.

Use the thermal cutoff with a voltage and current level lower than the rated level.

If the thermal cutoff is used with a voltage or current level higher than the rated level, contacts may melt in the SF type, causing the fuse to malfunction. In the SM type, the body of the thermal cutoff may be destroyed.

Do not use the thermal cutoff in water, organic solvents or other liquids, or environments containing sulfurous acid gas, nitrous acid gas, or high humidity.

Doing so will cause deterioration of the sealing resin, the thermal cutoff may operate at lower than operating temperature, or any other malfunctions may occur. Also, the thermal cutoff may not operate even if its operating temperature is exceeded.

<table>
<thead>
<tr>
<th>Type</th>
<th>Body Temperature</th>
<th>Type</th>
<th>Body Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>SM072A</td>
<td>52°C</td>
<td>SF 70E,K,Y</td>
<td>50°C</td>
</tr>
<tr>
<td>SM082A, B</td>
<td>62°C</td>
<td>SF 76E,K,Y</td>
<td>56°C</td>
</tr>
<tr>
<td>SM092A, B</td>
<td>72°C</td>
<td>SF 91E,K,Y</td>
<td>71°C</td>
</tr>
<tr>
<td>SM095A, B, G</td>
<td>75°C</td>
<td>SF 96E,K,Y</td>
<td>76°C</td>
</tr>
<tr>
<td>SM110A, B, G</td>
<td>90°C</td>
<td>SF113E, Y</td>
<td>90°C</td>
</tr>
<tr>
<td>SM125A, B</td>
<td>106°C</td>
<td>SF119E,K,Y</td>
<td>99°C</td>
</tr>
<tr>
<td>SM126A, B, G</td>
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<td>SF129E,Y</td>
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</tr>
<tr>
<td>SM130A, B, G</td>
<td>110°C</td>
<td>SF139E,Y</td>
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<td>SM134A, B, G</td>
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<td>SF152E,Y</td>
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<td>SM137A, B, G</td>
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<td>SF169E,Y</td>
<td>140°C</td>
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<td>SM146A, B, G</td>
<td>126°C</td>
<td>SF184E,Y</td>
<td>140°C</td>
</tr>
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<td>SM150A, B</td>
<td>126°C</td>
<td>SF188E,K,Y</td>
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<td>SM164A</td>
<td>140°C</td>
<td>SF214E,K,Y</td>
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<tr>
<td>SM182A</td>
<td>140°C</td>
<td>SF226E,Y</td>
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</tr>
<tr>
<td>SF Type</td>
<td></td>
<td>SF240E,Y</td>
<td>140°C</td>
</tr>
</tbody>
</table>

Temperatures listed in the table aren't ambient temperature but body temperature of a thermal cutoff.

Table 1
**Cautions**

**SEFUSE™**

### Lead wire process

- When bending the lead wire, in order to protect the resin seal from excessive pressure, secure the lead wire close to the case and bend the part beyond the secured section. The lead wire should be bent at a distance **3 mm or more** from the body of the fuse, and should not be twisted.

- The tensile strength applied to the lead wire should be **5 kg or less** for the SF type, and **1 kg or less** for the SM type.

- The strength applied to the body of the thermal cutoff should be **10 kg or less** for the SF type, and **5 kg or less** for the SM type.

In the case of an SF type, deformation of the case may change the location of the sliding contact during operation and may cause the thermal cutoff to operate only at temperatures lower than the normal operating temperature range. The thermal cutoff also may not operate even if the thermal cutoff’s operating temperature is exceeded.

### Mounting

**SEFUSE™** can be mounted by soldering, caulking, or welding.

- The connecting position at the lead of resin-sealed side should be **5 mm or more** from the body of the thermal cutoff.

- If soldering, note that the thermal cutoff may not function because of excessive solder temperature. To prevent such malfunctions, for example, holding the lead near the case by a tool is effective for allowing the heat to escape, and the soldering should be done in short interval. Another effective method is to use a lower solder temperature and to solder at a location that is distant from the case.

- If caulking or welding, be careful to keep the resistance value of the connecting section low. If the connecting section has a high resistance value, the passing current may generate an abnormally high temperature that will cause the thermal cutoff to operate (break the circuit).

- After mounting the thermal cutoff, be careful not to apply force that may pull, push or twist the lead wires.
● If using a SF type thermal cutoff, be sure not to make the lead on the resin-sealed side touch the case. This would cause the current to flow from the lead on the resin-sealed side to the opposite lead so that the thermal cutoff cannot break the circuit.

Note that the body of the SF type is the same in potential as the circuit. Therefore, it must be electrically isolated from the other metallic part.

■ Storage

● The body and lead A of SF type, and the leads of SM092A, SM164A, SM182A and SM092B are silver-plated. Therefore, these parts may discolor because of sulfuration. In the case, the marking of the body will become difficult to discriminate or the solder-ability of lead will decline. To avoid this, the SEFUSE should not keep around materials (such as cardboard or rubber, etc.) which generate sulfurous acid gas.

● When the SEFUSE have to be stored in a cardboard box, the SEFUSE's packs should be put into other bags (such as polyethylene) and make sure the packs seal.

■ Recommendation

● We recommend the following tests on the receiving of the SEFUSE and after mounting it, as it may have a mechanical load or thermal influence under transportation or when being mounted.
  1) Appearance check
  2) Resistance check (comparing before with after), or conductive check
  3) X-ray inspection
  4) Operation check for sampling

● Be careful when mounting the thermal cutoff because external force, heat, or a harmful atmosphere (containing excessive humidity or sulfurous acid gas) may damage the characteristics of the thermal cutoff. If applicable, it is recommended to warn general consumers who are not aware of the usage cautions for the thermal cutoff not to mount, remove or replace the thermal cutoff through a note to this effect in the user's manual and other related material.

If you desire any clarifications or explanations regarding these cautions, please contact us.

The values contained in this document were obtained under certain testing conditions by us. They are not guaranteed and are for reference only.
The information herein is based on the documents as of January 2006, and is subject to change without notice. Therefore it is recommended to refer to latest individual information such as drawing for mass production designing.

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Although we have been making continuous efforts to improve the quality and reliability of our products, the possibility of defects cannot be eliminated entirely. Therefore when using our electronic component products, please make sure to consider safety measures in its design, such as redundancy, fire containment and malfunction prevention against physical injuries, fire disasters and social damages in consideration of the said defect occurrences.

Our products are classified into 2 quality grades: "Standard" and "Special". The recommended applications of the products according to its quality level are indicated below. If you intend to use our products for applications other than "Standard" level, please make sure to consult with our sales representative in advance.

"Standard"
Computers, office equipment, communication equipment, measuring equipment, audio & visual equipment, home electric appliances, machine tools, personal electric equipment and industrial robots. etc.

"Special"
Transportation equipment (automobiles, trains, ships and others), aircrafts, aerospace equipment, medical equipment for life support. etc.
Please contact the following representatives for the information on the SEFUSE.

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