**SinglFuse™ SF-0603FPxxxF Series Features**
- Single blow fuse for overcurrent protection
- 1608 (EIA 0603) miniature footprint
- Fast-acting precision fuse
- UL 248-14 listed
- RoHS compliant* and halogen free**
- Thin film chip design
- Surface mount packaging for automated assembly

**SF-0603FPxxxF Series - Fast Acting Precision Surface Mount Fuses**

### Electrical Characteristics

<table>
<thead>
<tr>
<th>Model</th>
<th>Rated Current (Amps)</th>
<th>Fusing Time (Resistance (Ω) Typ.***</th>
<th>Rated Voltage</th>
<th>Interrupting Rating</th>
<th>Typical I²t (A²s) ****</th>
</tr>
</thead>
<tbody>
<tr>
<td>SF-0603FP015F-2</td>
<td>0.15</td>
<td>2.20</td>
<td>DC 65 V</td>
<td>AC/DC 35 V 50 A</td>
<td>0.0006</td>
</tr>
<tr>
<td>SF-0603FP020F-2</td>
<td>0.20</td>
<td>1.30</td>
<td>DC 65 V</td>
<td>DC 65 V 13 A</td>
<td>0.0014</td>
</tr>
<tr>
<td>SF-0603FP025F-2</td>
<td>0.25</td>
<td>1.10</td>
<td>DC 65 V</td>
<td>DC 65 V 13 A</td>
<td>0.0016</td>
</tr>
<tr>
<td>SF-0603FP0375F-2</td>
<td>0.375</td>
<td>0.48</td>
<td>AC/DC 35 V</td>
<td>AC/DC 35 V 35 A</td>
<td>0.0040</td>
</tr>
<tr>
<td>SF-0603FP050F-2</td>
<td>0.50</td>
<td>0.185</td>
<td>AC/DC 35 V</td>
<td>AC/DC 35 V 35 A</td>
<td>0.0120</td>
</tr>
<tr>
<td>SF-0603FP075F-2</td>
<td>0.75</td>
<td>0.112</td>
<td>AC/DC 35 V</td>
<td>AC/DC 35 V 35 A</td>
<td>0.0210</td>
</tr>
<tr>
<td>SF-0603FP100F-2</td>
<td>1.00</td>
<td>0.069</td>
<td>AC/DC 35 V</td>
<td>AC/DC 35 V 35 A</td>
<td>0.0420</td>
</tr>
<tr>
<td>SF-0603FP125F-2</td>
<td>1.25</td>
<td>0.048</td>
<td>DC 35 V</td>
<td>AC/DC 35 V 35 A</td>
<td>0.0520</td>
</tr>
<tr>
<td>SF-0603FP150F-2</td>
<td>1.50</td>
<td>0.037</td>
<td>DC 35 V</td>
<td>AC/DC 35 V 35 A</td>
<td>0.0710</td>
</tr>
<tr>
<td>SF-0603FP175F-2</td>
<td>1.75</td>
<td>0.031</td>
<td>DC 35 V</td>
<td>AC/DC 35 V 35 A</td>
<td>0.10</td>
</tr>
<tr>
<td>SF-0603FP200F-2</td>
<td>2.00</td>
<td>0.026</td>
<td>DC 35 V</td>
<td>AC/DC 35 V 35 A</td>
<td>0.14</td>
</tr>
<tr>
<td>SF-0603FP250F-2</td>
<td>2.50</td>
<td>0.021</td>
<td>DC 35 V</td>
<td>AC/DC 24 V 50 A</td>
<td>0.24</td>
</tr>
<tr>
<td>SF-0603FP300F-2</td>
<td>3.00</td>
<td>0.0176</td>
<td>DC 35 V</td>
<td>1.10</td>
<td></td>
</tr>
<tr>
<td>SF-0603FP350F-2</td>
<td>3.50</td>
<td>0.0148</td>
<td>DC 35 V</td>
<td>0.63</td>
<td></td>
</tr>
<tr>
<td>SF-0603FP400F-2</td>
<td>4.00</td>
<td>0.0125</td>
<td>DC 35 V</td>
<td>0.49</td>
<td></td>
</tr>
<tr>
<td>SF-0603FP500F-2</td>
<td>5.00</td>
<td>0.0095</td>
<td>DC 35 V</td>
<td>0.33</td>
<td></td>
</tr>
</tbody>
</table>

*** Resistance value measured with ≤10 % rated current at 25 °C ambient. Tolerance ±25 %.

**** Melting I²t calculated at 0.001 second pre-arcing time.

### Reliability Testing

<table>
<thead>
<tr>
<th>No.</th>
<th>Test</th>
<th>Requirement</th>
<th>Test Condition</th>
<th>Test Reference</th>
</tr>
</thead>
</table>
| 1   | Bending | ≤1 A: DCR change ≤ ±10 %  
     |      | >1 A: DCR change ≤ ±20 % | 2 mm | Refer to STP document |
| 2   | Solderability | Minimum 95 % coverage | One dip at 255 °C for 5 seconds | MIL-STD-202 Method 208 |
| 3   | Thermal shock | DCR change ≤ ±10 %  
     |      | No mechanical damage | 100 cycles between -55 °C and +125 °C | MIL-STD-202 Method 107 |
| 4   | Moisture resistance | DCR change ≤ ±10 %  
     |      | No excessive corrosion | 10 cycles | MIL-STD-202 Method 106 |
| 5   | Salt spray | DCR change ≤ ±10 %  
     |      | No excessive corrosion | 48 hour exposure, 5 % salt solution | MIL-STD-202 Method 101 |
| 6   | Mechanical vibration | DCR change ≤ ±10 %  
     |      | No mechanical damage | 0.4 inch D.A. or 30 G between 5-3000 Hz | MIL-STD-202 Method 204 |
| 7   | Mechanical shock | DCR change ≤ ±10 %  
     |      | No mechanical damage | 1500 G, 0.5 ms, half-sine shocks | MIL-STD-202 Method 213 |
| 8   | Life | No electrical “opens” during testing  
     |      | Voltage drop change shall be less than ±10 % of initial value | 75 % rated current for 2000 hours at ambient temperature between +20 °C and +30 °C | Refer to STP document |

### Agency Recognition

UL File Number: E198545

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** Bourns considers a product to be “halogen free” if (a) the Bromine (Br) content is 900 ppm or less; (b) the Chlorine (Cl) content is 900 ppm or less; and (c) the total Bromine (Br) and Chlorine (Cl) content is 1500 ppm or less.

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Users should verify actual device performance in their specific applications.

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**WARNING Cancer and Reproductive Harm**

www.P65Warnings.ca.gov

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**Electrical Characteristics***

- **Resistance (Ω) Typ.***
- **Rated Voltage**
- **Interrupting Rating**
- **Typical I²t (A²s) ****

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**Reliability Testing**

- **Requirement**
- **Test Condition**
- **Test Reference**

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**Agency Recognition**

UL File Number: E198545
SinglFuse™ SF-0603FPxxxF Series Applications

- Portable memory
- LCD monitors
- Disk drives
- PDAs
- Digital cameras
- MP3 players
- Cell phones
- Rechargeable battery packs
- Battery chargers
- Set-top boxes
- Industrial controllers
- Battery Management Systems (BMS)
- LED lighting
- Power tools
- Portable memory
- LCD monitors
- Disk drives
- PDAs
- Digital cameras
- MP3 players
- Cell phones
- Rechargeable battery packs
- Battery chargers
- Set-top boxes
- Industrial controllers
- Battery Management Systems (BMS)
- LED lighting
- Power tools

Environmental Characteristics

Operating Temperature: -55 °C to +90 °C
Storage Conditions
- Temperature: +5 °C to +35 °C
- Humidity: 40% to 75%
- Shelf Life: 2 years from manufacturing date

Moisture Sensitivity Level: Class 1
ESD Classification (HBM): Class 6

Typical Part Marking

Represents total content. Layout may vary.

How to Order

SF - 0603 FP 015 F - 2

SinglFuse™ Product Designator
SMD Footprint
1608 = (EIA 0603) size
Fuse Blow Type
FP = Fast acting precision
Rated Current
015 ~ 500 (150 mA ~ 5.0 A)
Structure Type
F = Thin film
Packaging Type
- 2 = Tape & Reel

Construction

Packaging Quantity
8,000 pieces per 7-inch reel

Product Dimensions

Recommended Pad Layout

Current Rating Thermal Derating Curve

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**Solder Reflow Recommendations**

### Recommended Temperature Profile for Wave Soldering

Wave soldering is suitable for 0603 size models.

### Profile Feature | Pb-Free Assembly
---|---
Preheat / Soak:  
Temperature Min. ($T_{\text{min}}$) | 150 °C
Temperature Max. ($T_{\text{max}}$) | 200 °C
Time ($t_p$) from ($T_{\text{min}}$ to $T_{\text{max}}$) | 60–120 seconds

Ramp Up Rate ($T_L$ to $T_p$) | 3 °C / second max.

Liquidous Temperature ($T_L$) | 217 °C
Time ($t_L$) maintained above $T_L$ | 60–150 seconds

Peak Package Body Temperature ($T_p$) | 260 °C

Time ($t_p$)* within 5 °C of the specified classification temperature ($T_c$) | 30 seconds*

Ramp Down Rate ($T_p$ to $T_L$) | 6 °C / second max.

Time 25 °C to Peak Temperature | 8 minutes max.

*Tolerance for peak profile temperature ($T_p$) is defined as a supplier minimum and a user maximum.

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### Tape Dimensions

<table>
<thead>
<tr>
<th>Dimension</th>
<th>SF-0603FPxxxF Series per EIA 481-2</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>8.10 ± 0.20 (.319 ± 0.008)</td>
</tr>
<tr>
<td>P₀</td>
<td>4.0 ± 0.10 (.157 ± 0.004)</td>
</tr>
<tr>
<td>P₁</td>
<td>2.0 ± 0.05 (.079 ± 0.002)</td>
</tr>
<tr>
<td>P₂</td>
<td>2.0 ± 0.05 (.079 ± 0.002)</td>
</tr>
<tr>
<td>A₀</td>
<td>1.00 ± 0.10 (.039 ± 0.004)</td>
</tr>
<tr>
<td>B₀</td>
<td>1.80 ± 0.10 (.071 ± 0.004)</td>
</tr>
<tr>
<td>F</td>
<td>3.50 ± 0.05 (.138 ± 0.002)</td>
</tr>
<tr>
<td>E₁</td>
<td>1.75 ± 0.10 (.069 ± 0.004)</td>
</tr>
<tr>
<td>D₀</td>
<td>1.55 ± 0.05 (.061 ± 0.002)</td>
</tr>
<tr>
<td>T</td>
<td>0.60 ± 0.08 (.024 ± 0.003)</td>
</tr>
</tbody>
</table>

### Packaging Information

**Packaging:** Paper tape, 8,000 pcs. per reel

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