### SinglFuse™ SF-0402FPxxxF Series Features
- Single blow fuse for overcurrent protection
- 1005 (EIA 0402) 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

### Electrical Characteristics

<table>
<thead>
<tr>
<th>Model</th>
<th>Rated Current (Amps)</th>
<th>Fusing Time</th>
<th>Resistance (Ω) Typ.***</th>
<th>Rated Voltage</th>
<th>Interrupting Rating</th>
<th>Typical I^2t (A^2 s) ****</th>
</tr>
</thead>
<tbody>
<tr>
<td>SF-0402FP020F</td>
<td>0.20</td>
<td>Open within 5 sec. at 300 % rated current</td>
<td>0.60</td>
<td>DC 35 V</td>
<td>0.0017</td>
<td></td>
</tr>
<tr>
<td>SF-0402FP025F</td>
<td>0.25</td>
<td></td>
<td>0.33</td>
<td>DC 35 V</td>
<td>0.0035</td>
<td></td>
</tr>
<tr>
<td>SF-0402FP0375F</td>
<td>0.375</td>
<td></td>
<td>0.24</td>
<td>DC 35 V</td>
<td>0.0036</td>
<td></td>
</tr>
<tr>
<td>SF-0402FP050F</td>
<td>0.50</td>
<td></td>
<td>0.16</td>
<td>DC 35 V</td>
<td>0.0060</td>
<td></td>
</tr>
<tr>
<td>SF-0402FP075F</td>
<td>0.75</td>
<td></td>
<td>0.10</td>
<td>DC 35 V 35 A</td>
<td>0.0120</td>
<td></td>
</tr>
<tr>
<td>SF-0402FP100F</td>
<td>1.00</td>
<td></td>
<td>0.073</td>
<td>DC 35 V 35 A</td>
<td>0.024</td>
<td></td>
</tr>
<tr>
<td>SF-0402FP125F</td>
<td>1.25</td>
<td></td>
<td>0.054</td>
<td>DC 35 V</td>
<td>0.045</td>
<td></td>
</tr>
<tr>
<td>SF-0402FP150F</td>
<td>1.50</td>
<td></td>
<td>0.040</td>
<td>DC 35 V</td>
<td>0.081</td>
<td></td>
</tr>
<tr>
<td>SF-0402FP175F</td>
<td>1.75</td>
<td></td>
<td>0.034</td>
<td>DC 35 V</td>
<td>0.092</td>
<td></td>
</tr>
<tr>
<td>SF-0402FP200F</td>
<td>2.00</td>
<td></td>
<td>0.031</td>
<td>DC 35 V</td>
<td>0.120</td>
<td></td>
</tr>
<tr>
<td>SF-0402FP250F</td>
<td>2.50</td>
<td></td>
<td>0.018</td>
<td>DC 35 V</td>
<td>0.220</td>
<td></td>
</tr>
<tr>
<td>SF-0402FP300F</td>
<td>3.00</td>
<td></td>
<td>0.015</td>
<td>DC 35 V</td>
<td>0.270</td>
<td></td>
</tr>
<tr>
<td>SF-0402FP350F</td>
<td>3.50</td>
<td></td>
<td>0.012</td>
<td>DC 35 V</td>
<td>0.340</td>
<td></td>
</tr>
<tr>
<td>SF-0402FP400F</td>
<td>4.00</td>
<td></td>
<td>0.011</td>
<td>DC 35 V</td>
<td>0.360</td>
<td></td>
</tr>
<tr>
<td>SF-0402FP500F</td>
<td>5.00</td>
<td></td>
<td>0.009</td>
<td>DC 35 V</td>
<td>0.550</td>
<td></td>
</tr>
</tbody>
</table>

*** Resistance value measured with ≤10 % rated current at 25 °C ambient. Tolerance ±25 %.
**** Melting I^2t calculated at 0.001 second pre-arching 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>
<tbody>
<tr>
<td>1</td>
<td>Bending</td>
<td>≤1 A: DCR change ≤ ±10 %</td>
<td>2 mm</td>
<td>Refer to STP doc-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>&gt;1 A: DCR change ≥ ±20 %</td>
<td></td>
<td>ument</td>
</tr>
<tr>
<td>2</td>
<td>Solderability</td>
<td>Minimum 95 % coverage</td>
<td>One dip at 255 °C for 5 seconds</td>
<td>MIL-STD-202 Method</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>208</td>
</tr>
<tr>
<td>3</td>
<td>Thermal shock</td>
<td>DCR change ≤ ±10 % No mechanical damage</td>
<td>100 cycles between -55 °C and +125 °C</td>
<td>MIL-STD-202 Method</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>107</td>
</tr>
<tr>
<td>4</td>
<td>Moisture resistance</td>
<td>DCR change ≤ ±10 % No excessive corrosion</td>
<td>10 cycles</td>
<td>MIL-STD-202 Method</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>106</td>
</tr>
<tr>
<td>5</td>
<td>Salt spray</td>
<td>DCR change ≤ ±10 % No excessive corrosion</td>
<td>48 hour exposure, 5 % salt solution</td>
<td>MIL-L-STD-202 Method</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>101</td>
</tr>
<tr>
<td>6</td>
<td>Mechanical vibration</td>
<td>DCR change ≤ ±10 % No mechanical damage</td>
<td>0.4 inch D.A. or 30 G between 5-3000 Hz</td>
<td>MIL-STD-202 Method</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>204</td>
</tr>
<tr>
<td>7</td>
<td>Mechanical shock</td>
<td>DCR change ≤ ±10 % No mechanical damage</td>
<td>1500 G, 0.5 ms, half-sine shocks</td>
<td>MIL-STD-202 Method</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>213</td>
</tr>
<tr>
<td>8</td>
<td>Life</td>
<td>No electrical “opens” during testing Voltage drop change shall be less than ±10 % of initial value</td>
<td>75 % rated current for 2000 hours at ambient temperature between +20 °C and +30 °C</td>
<td>Refer to STP doc-</td>
</tr>
</tbody>
</table>

** 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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WARNING Cancer and Reproductive Harm
www.P65Warnings.ca.gov
SinglFuse™ SF-0402FPxxxF Series - Fast Acting Precision Surface Mount Fuses

**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)

**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: 1
- ESD Classification (HBM): Class 6

**Typical Part Marking**

![Part Marking Diagram]

**How to Order**

SinglFuse™ SF - 0402 FP 050 F - 2

**Product Dimensions**

![Dimensions Diagram]

**Current Rating Thermal Derating Curve**

![Derating Curve Graph]

**Specifications**
- UL File Number: E198545
- Agency Recognition: E198545
- Construction: PCB Cu/Sn, EPOXY Cu/Sn
- Packaging Quantity: 20,000 pieces per 7-inch reel
- Recommended Pad Layout:

- Dimensions: MM (INCHES)
  - 0.010 (0.40)
  - 0.016 (0.040)
  - 0.020 (0.080)
  - 0.027 (0.086)
  - 0.300 (1.00)

**Notes**
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Solder Reflow Recommendations

**Profile Feature** | **Pb-Free Assembly**
--- | ---
Preheat / Soak: |  
Temperature Min. ($T_{\text{min}}$) | 150 °C
Temperature Max. ($T_{\text{max}}$) | 200 °C
Time ($t_{s}$) 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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Average Pre-Arcing Time vs. Current Curves

Average $I^2t$ vs. $t$ Curves

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**SF-0402FPxxxF Series Tape and Reel Packaging Specifications**

### Tape Dimensions

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Value (mm)</th>
<th>Value (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>W</strong></td>
<td>8.00 ± 0.10</td>
<td>0.315 ± 0.004</td>
</tr>
<tr>
<td><strong>P0</strong></td>
<td>4.0 ± 0.10</td>
<td>0.157 ± 0.004</td>
</tr>
<tr>
<td><strong>P1</strong></td>
<td>2.0 ± 0.05</td>
<td>0.079 ± 0.002</td>
</tr>
<tr>
<td><strong>P2</strong></td>
<td>2.0 ± 0.05</td>
<td>0.079 ± 0.002</td>
</tr>
<tr>
<td><strong>A0</strong></td>
<td>0.61 ± 0.05</td>
<td>0.024 ± 0.002</td>
</tr>
<tr>
<td><strong>B0</strong></td>
<td>1.15 ± 0.05</td>
<td>0.045 ± 0.002</td>
</tr>
<tr>
<td><strong>F</strong></td>
<td>3.50 ± 0.05</td>
<td>0.138 ± 0.002</td>
</tr>
<tr>
<td><strong>E1</strong></td>
<td>1.75 ± 0.10</td>
<td>0.069 ± 0.004</td>
</tr>
<tr>
<td><strong>D0</strong></td>
<td>1.50 ± 0.10</td>
<td>0.059 ± 0.004</td>
</tr>
<tr>
<td><strong>T</strong></td>
<td>0.43 ± 0.03</td>
<td>0.017 ± 0.001</td>
</tr>
</tbody>
</table>

**PACKAGING:** Paper tape, 20,000 pcs. per reel

**DIMENSIONS:**

- **DIA.** 13.40 ± 0.50 (0.520 ± 0.020)
- **DIA.** 13.20 ± 0.50 (0.520 ± 0.020) DIA.
- **DIA.** 178.00 ± 1.00 (7.008 ± 0.039) DIA.
- **DIA.** 60.30 ± 0.50 (2.382 ± 0.020) DIA.

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