

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

SF-0402FPxxxF Series - Fast Acting Precision Surface Mount Fuses

Electrical Characteristics

| Model | Rated Current (Amps) | Fusing Time | Resistance (Ω) Typ.*** | Rated Voltage | Interrupting Rating | Typical I ² t (A ² s) **** |
|----------------|----------------------|---|------------------------|---------------|---------------------|--|
| SF-0402FP020F | 0.20 | Open within 5 sec. at 300 % rated current | 0.60 | DC 35 V | DC 35 V 35 A | 0.0017 |
| SF-0402FP025F | 0.25 | | 0.33 | | | 0.0035 |
| SF-0402FP0375F | 0.375 | | 0.24 | | | 0.0036 |
| SF-0402FP050F | 0.50 | Open within 5 sec. at 200 % rated current | 0.16 | | | 0.0060 |
| SF-0402FP075F | 0.75 | | 0.10 | | | 0.0120 |
| SF-0402FP100F | 1.00 | | 0.073 | | | 0.024 |
| SF-0402FP125F | 1.25 | | 0.054 | | | 0.045 |
| SF-0402FP150F | 1.50 | | 0.040 | | | 0.081 |
| SF-0402FP175F | 1.75 | | 0.034 | | | 0.092 |
| SF-0402FP200F | 2.00 | | 0.031 | | | 0.120 |
| SF-0402FP250F | 2.50 | | 0.018 | | | 0.220 |
| SF-0402FP300F | 3.00 | | 0.015 | | | 0.270 |
| SF-0402FP350F | 3.50 | 0.012 | 0.340 | | | |
| SF-0402FP400F | 4.00 | 0.011 | 0.360 | | | |
| SF-0402FP500F | 5.00 | 0.009 | 0.550 | | | |

*** 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

| No. | Test | Requirement | Test Condition | Test Reference |
|-----|----------------------|---|--|-------------------------|
| 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 | MI L-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 |

* RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011.

** 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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Specifications are subject to change without notice.

Users should verify actual device performance in their specific applications.

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WARNING Cancer and Reproductive Harm
www.P65Warnings.ca.gov

SingIFuse™ SF-0402FPxxxF Series Applications

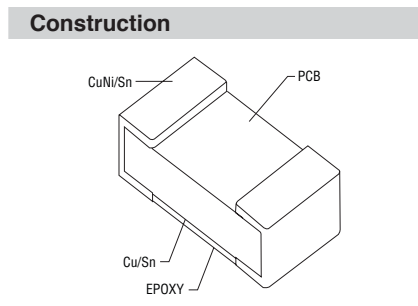
- Portable memory
- Cell phones
- LED lighting
- LCD monitors
- Rechargeable battery packs
- Power tools
- Disk drives
- Battery chargers
- Set-top boxes
- Digital cameras
- Industrial controllers
- Battery Management Systems (BMS)
- MP3 players

SF-0402FPxxxF Series - Fast Acting Precision Surface Mount Fuses BOURNS®

| 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 |

Agency Recognition

UL File Number E198545



Typical Part Marking

Represents total content. Layout may vary.

RATED CURRENT (A)

| | | |
|-------------|-----------|------------|
| •• = 0.200 | ⊕ = 1.00 | H = 2.50 |
| • = 0.250 | × = 1.25 | III = 3.00 |
| ••• = 0.375 | II = 1.50 | HH = 3.50 |
| I = 0.500 | — = 1.75 | □ = 4.00 |
| — = 0.750 | H = 2.00 | ○ = 5.00 |

How to Order

SF - 0402 FP 050 F - 2

SingIFuse™
Product Designator

SMD Footprint
0402 = 1005 (EIA 0402) size

Fuse Blow Type
FP = Fast acting precision

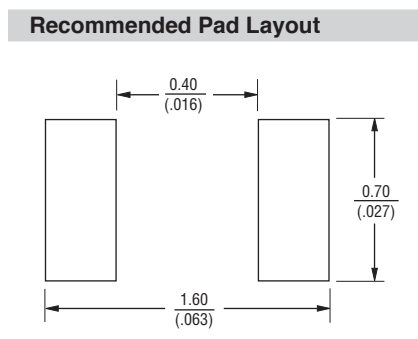
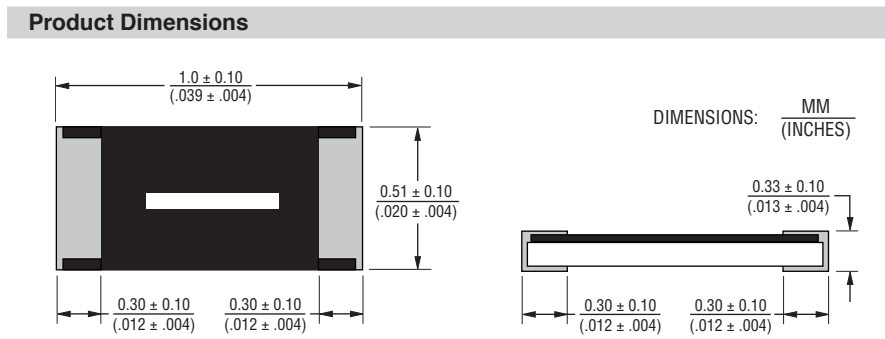
Rated Current
020 ~ 500 (200 mA ~ 5.00 A)

Structure Type
F = Thin film

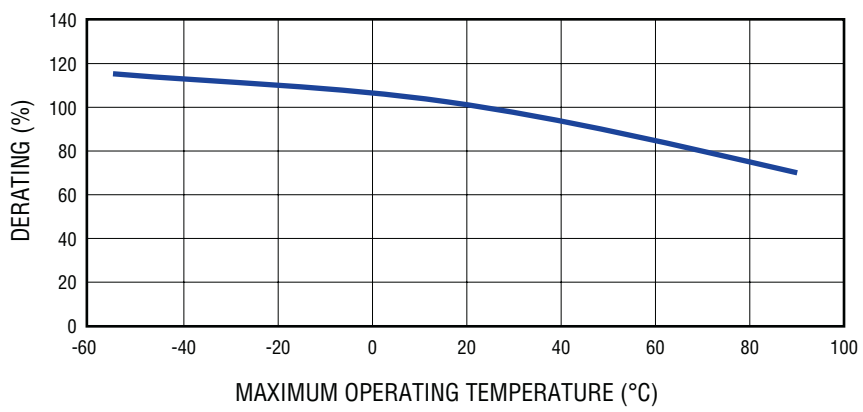
Packaging Type
- 2 = Tape & Reel

Packaging Quantity

20,000 pieces per 7-inch reel



Current Rating Thermal Derating Curve



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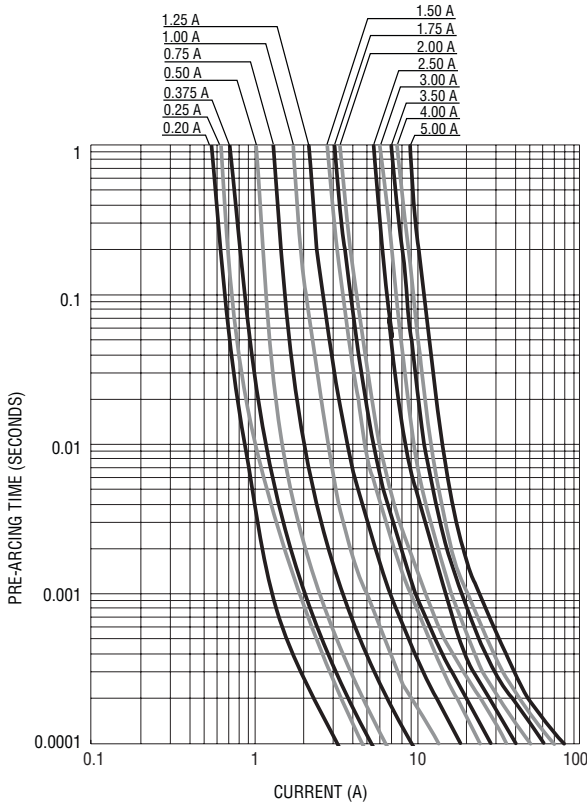
Solder Reflow Recommendations



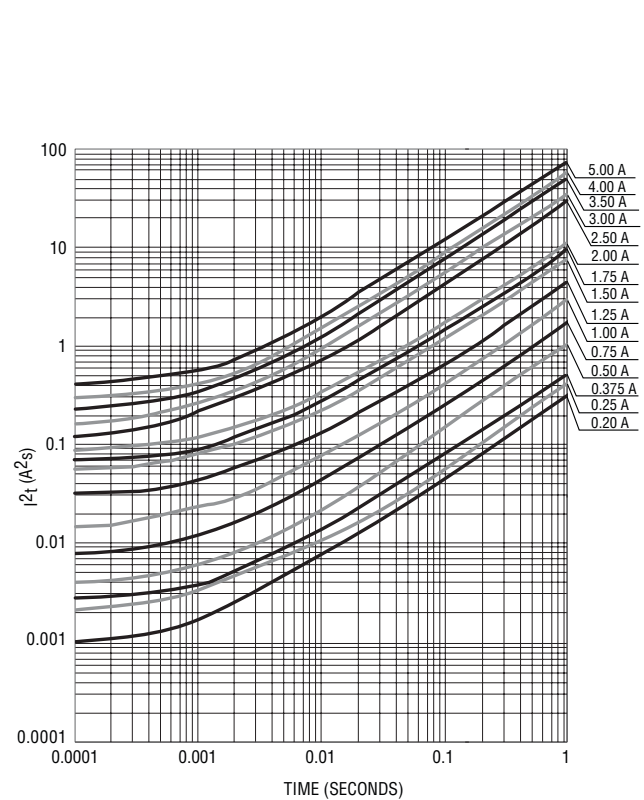
| Profile Feature | Pb-Free Assembly |
|---|------------------------------------|
| Preheat / Soak: Temperature Min. (T_{sm}) Temperature Max. (T_{smx}) Time (t_s) from (T_{sm} to T_{smx}) | 150 °C 200 °C 60~120 seconds |
| Ramp Up Rate (T_l to T_d) | 3 °C / second max. |
| Liquidous Temperature (T_l) Time (t_L) maintained above T_l | 217 °C 60~150 seconds |
| Peak Package Body Temperature (T_d) | 260 °C |
| Time (t_p)* within 5 °C of the specified classification temperature (T_c) | 30 seconds* |
| Ramp Down Rate (T_d 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.

Average Pre-Arcing Time vs. Current Curves



Average I²t vs. t Curves



REV. E 01/19

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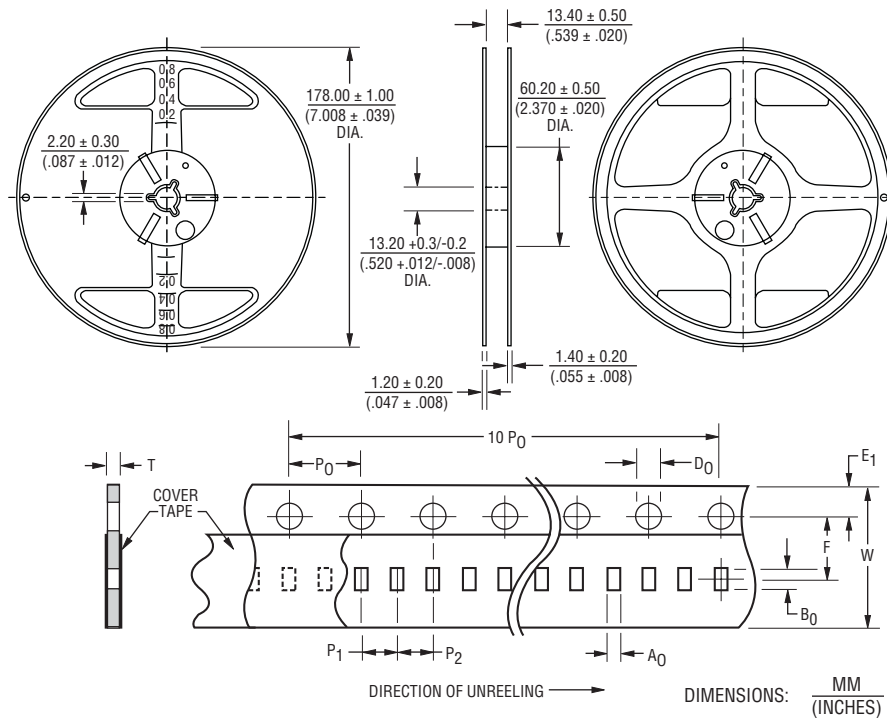
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SF-0402FPxxxF Series Tape and Reel Packaging Specifications

BOURNS®

| Tape Dimensions | SF-0402FPxxxF Series per EIA 481-2 |
|-----------------|---|
| W | $\frac{8.00 \pm 0.10}{(.315 \pm .004)}$ |
| P ₀ | $\frac{4.0 \pm 0.10}{(.157 \pm .004)}$ |
| P ₁ | $\frac{2.0 \pm 0.05}{(.079 \pm .002)}$ |
| P ₂ | $\frac{2.0 \pm 0.05}{(.079 \pm .002)}$ |
| A ₀ | $\frac{0.61 \pm 0.05}{(.024 \pm .002)}$ |
| B ₀ | $\frac{1.15 \pm 0.05}{(.045 \pm .002)}$ |
| F | $\frac{3.50 \pm 0.05}{(.138 \pm .002)}$ |
| E ₁ | $\frac{1.75 \pm 0.10}{(.069 \pm .004)}$ |
| D ₀ | $\frac{1.50 \pm 0.10}{(.059 \pm .004)}$ |
| T | $\frac{0.43 \pm 0.03}{(.017 \pm .001)}$ |

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



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