



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

| Model | Rated Current (Amps) | Fusing Time | Resistance (Ω) Typ.*** | Rated Voltage | Interrupting Rating | Typical I ² t (A ² s) **** |
|------------------|----------------------|---|------------------------|---------------|------------------------------|--|
| SF-0603FP015F-2 | 0.15 | Open within 5 sec. at 200 % rated current | 2.20 | DC 65 V | DC 35 V 50 A AC 65 V 13 A | 0.0006 |
| SF-0603FP020F-2 | 0.20 | | 1.30 | | | 0.0014 |
| SF-0603FP025F-2 | 0.25 | | 1.10 | | | 0.0016 |
| SF-0603FP0375F-2 | 0.375 | | 0.48 | | | 0.0040 |
| SF-0603FP050F-2 | 0.50 | | 0.185 | | | 0.0120 |
| SF-0603FP075F-2 | 0.75 | | 0.112 | | | 0.0210 |
| SF-0603FP100F-2 | 1.00 | | 0.069 | | | 0.0420 |
| SF-0603FP125F-2 | 1.25 | | 0.048 | | | 0.0520 |
| SF-0603FP150F-2 | 1.50 | | 0.037 | 0.0710 | | |
| SF-0603FP175F-2 | 1.75 | | 0.031 | DC 35 V | DC 35 V 35 A AC 24 V 50 A | 0.10 |
| SF-0603FP200F-2 | 2.00 | | 0.026 | | | 0.14 |
| SF-0603FP250F-2 | 2.50 | | 0.021 | | | 0.24 |
| SF-0603FP300F-2 | 3.00 | | 0.0176 | | | 0.33 |
| SF-0603FP350F-2 | 3.50 | | 0.0148 | | | 0.49 |
| SF-0603FP400F-2 | 4.00 | | 0.0125 | | | 0.63 |
| SF-0603FP500F-2 | 5.00 | | 0.0095 | | | 1.10 |

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

**** 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 | 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

<http://www.ul.com/> Follow link to Online Certificates Directory, then enter UL File No. E198545, or [click here](#)

* 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.

"SinglFuse" is a trademark of Bourns, Inc.

Specifications are subject to change without notice.

The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time.

Users should verify actual device performance in their specific applications.

SingIFuse™ 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

SF-0603FPxxxF 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

Typical Part Marking

Represents total content. Layout may vary.



| RATED CURRENT (A) | |
|-------------------|-------------|
| · = 0.150 | II = 1.500 |
| .. = 0.200 | = = 1.750 |
| · · = 0.250 | ≡ = 2.000 |
| ·· · = 0.375 | H = 2.500 |
| I = 0.500 | III = 3.000 |
| — = 0.750 | HH = 3.500 |
| + = 1.000 | □ = 4.000 |
| x = 1.250 | ○ = 5.000 |

How to Order

SF - 0603 FP 015 F - 2

SingIFuse™
 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



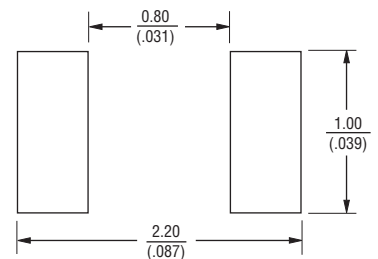
Packaging Quantity

8,000 pieces per 7-inch reel

Product Dimensions



Recommended Pad Layout



Current Rating Thermal Derating Curve



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Solder Reflow Recommendations



| Profile Feature | Pb-Free Assembly |
|---|------------------------------------|
| Preheat / Soak: Temperature Min. (T_{smin}) Temperature Max. (T_{smax}) Time (t_s) from (T_{smin} to T_{smax}) | 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. |

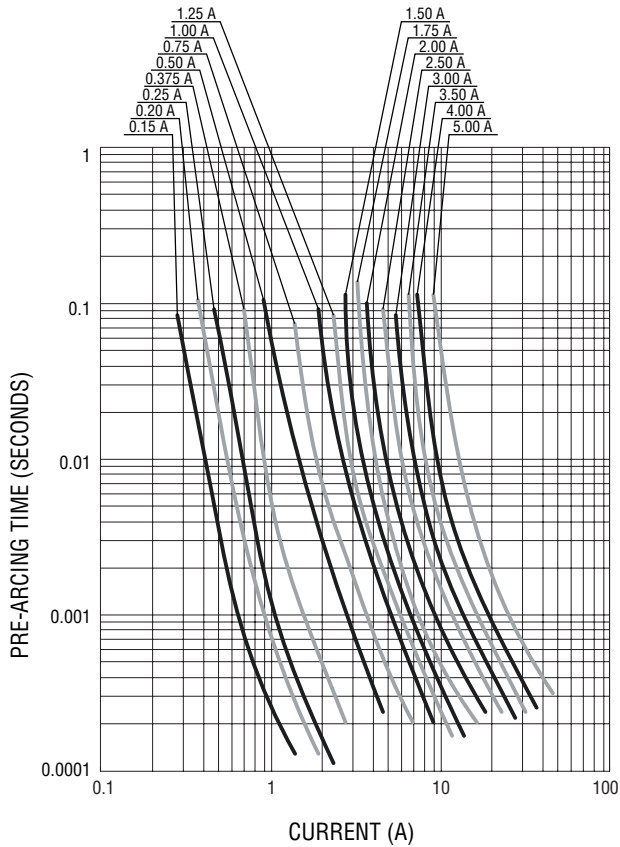
* Tolerance for peak profile temperature (T_p) is defined as a supplier minimum and a user maximum.

Recommended Temperature Profile for Wave Soldering



Wave soldering is suitable for 0603 size models.

Average Pre-Arcing Time vs. Current Curves



Average I²t vs. t Curves



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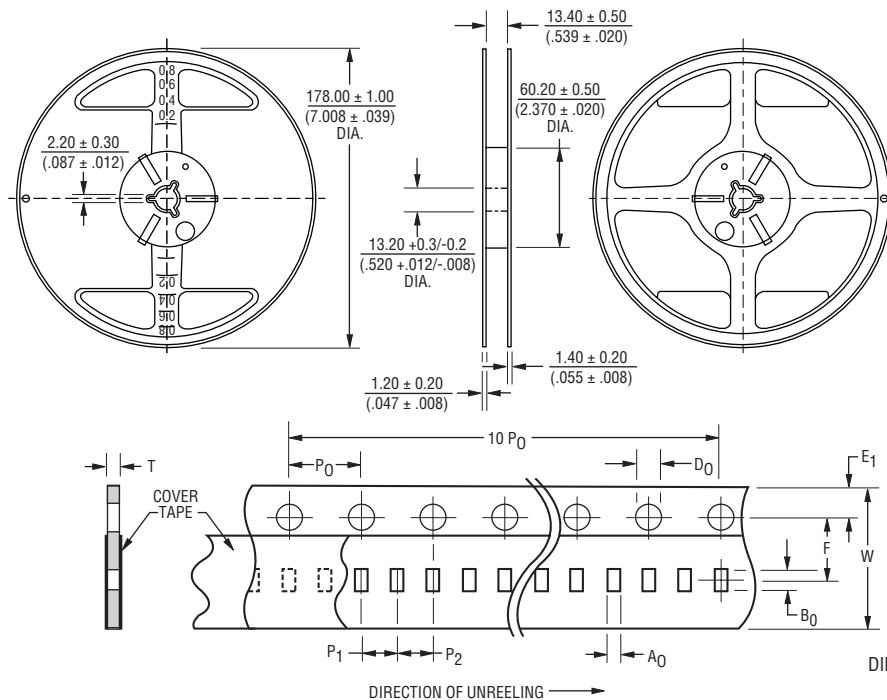
www.bourns.com

SF-0603FPxxxF Series Tape and Reel Packaging Specifications

BOURNS®

| Tape Dimensions | SF-0603FPxxxF Series per EIA 481-2 |
|-----------------|---|
| W | $\frac{8.10 \pm 0.20}{(.319 \pm .008)}$ |
| 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 | $\frac{1.00 \pm 0.10}{(.039 \pm .004)}$ |
| B ₀ | $\frac{1.80 \pm 0.10}{(.071 \pm .004)}$ |
| F | $\frac{3.50 \pm 0.05}{(.138 \pm .002)}$ |
| E ₁ | $\frac{1.75 \pm 0.10}{(.069 \pm .004)}$ |
| D ₀ | $\frac{1.55 \pm 0.05}{(.061 \pm .002)}$ |
| T | $\frac{0.60 \pm 0.08}{(.024 \pm .003)}$ |

PACKAGING: Paper tape, 8,000 pcs. per reel



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