



## 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 <sup>2</sup> t (A <sup>2</sup> 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.

\*\*\*\* Melting I<sup>2</sup>t 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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Users should verify actual device performance in their specific applications.

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# SingIFuse™ SF-0402FPxxxF 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-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

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

**Typical Part Marking**

Represents total content. Layout may vary.

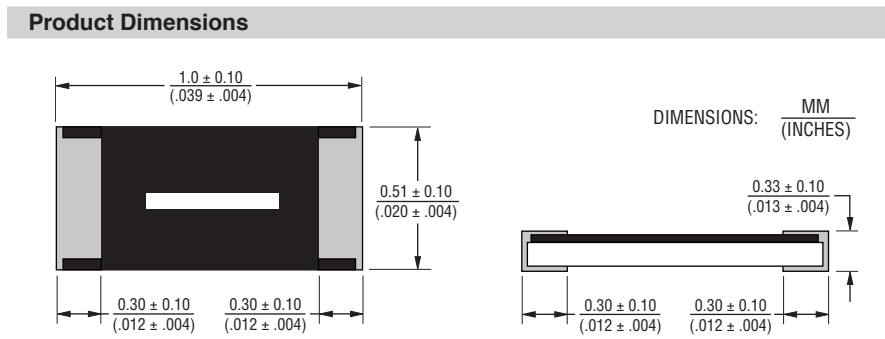
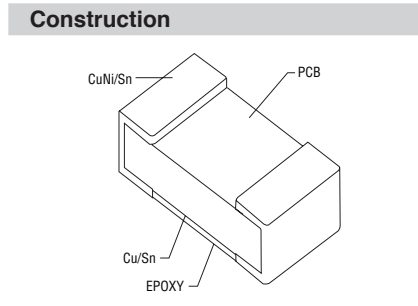


RATED CURRENT (A)		
•• = 0.200	⊕ = 1.00	H = 2.50
• = 0.250	× = 1.25	III = 3.00
••• = 0.375	II = 1.50	IIH = 3.50
I = 0.500	— = 1.75	□ = 4.00
— = 0.750	⊞ = 2.00	○ = 5.00

**How to Order**

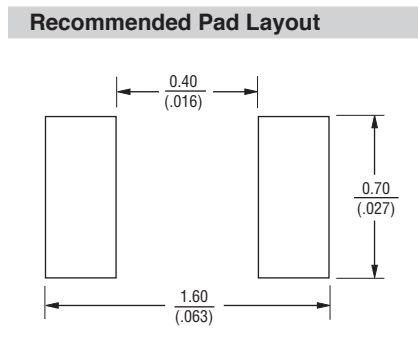
**SF - 0402 FP 050 F - 2**

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

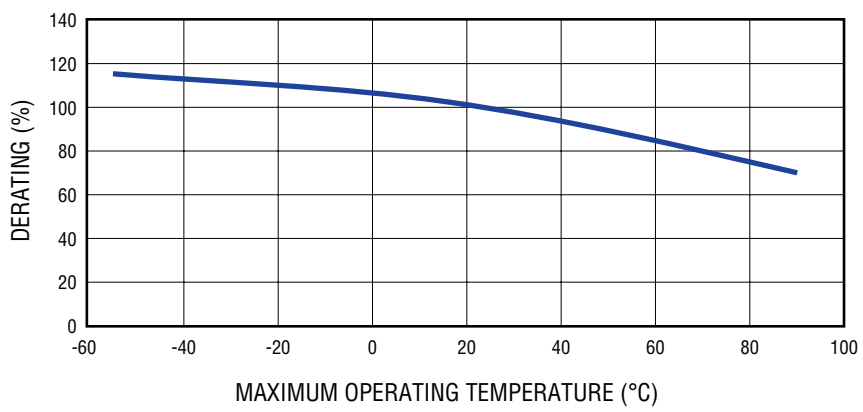


**Packaging Quantity**

20,000 pieces per 7-inch reel



### Current Rating Thermal Derating Curve



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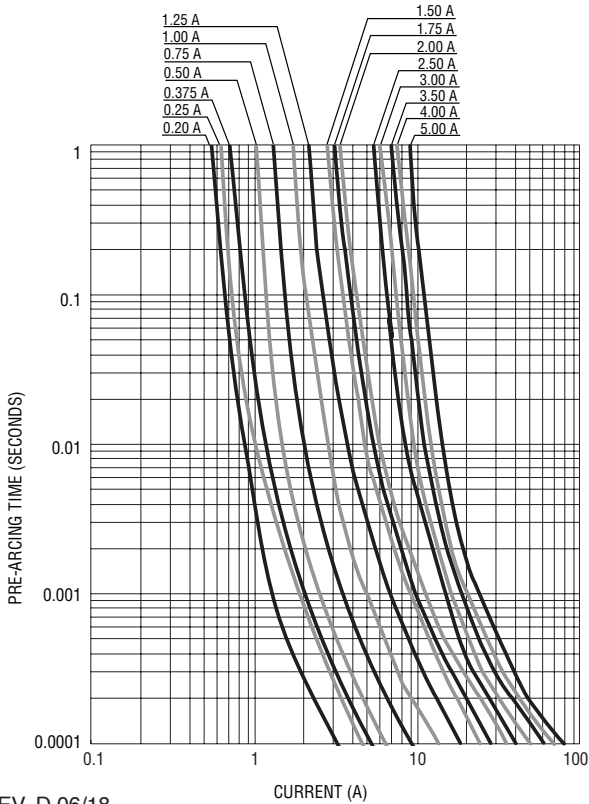
**Solder Reflow Recommendations**



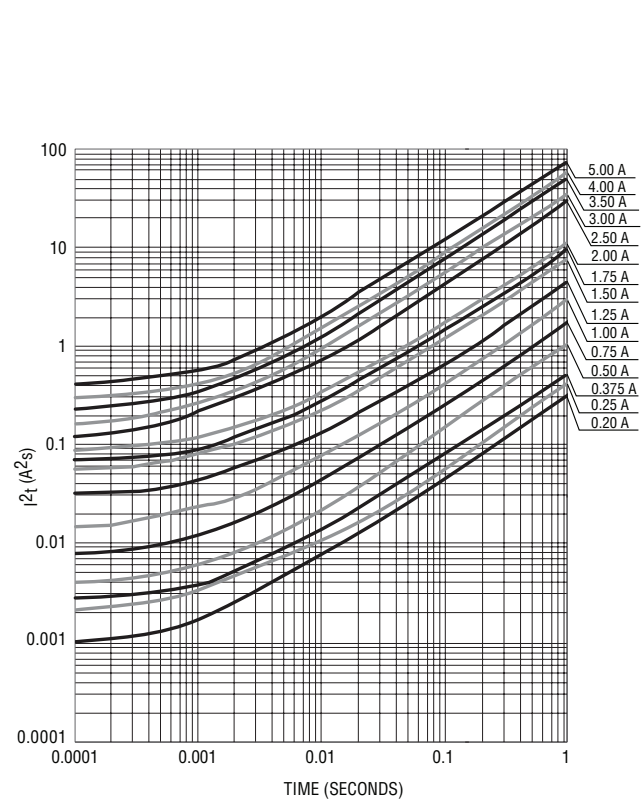
Profile Feature	Pb-Free Assembly
Preheat / Soak: Temperature Min. ( $T_{smin}$ ) Temperature Max. ( $T_{smax}$ ) Time ( $t_s$ ) from ( $T_{smin}$ to $T_{smax}$ )	150 °C 200 °C 60~120 seconds
Ramp Up Rate ( $T_L$ to $T_d$ )	3 °C / second max.
Liquidous Temperature ( $T_L$ ) Time ( $t_L$ ) maintained above $T_L$	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.

**Average Pre-Arcing Time vs. Current Curves**



**Average I²t vs. t Curves**



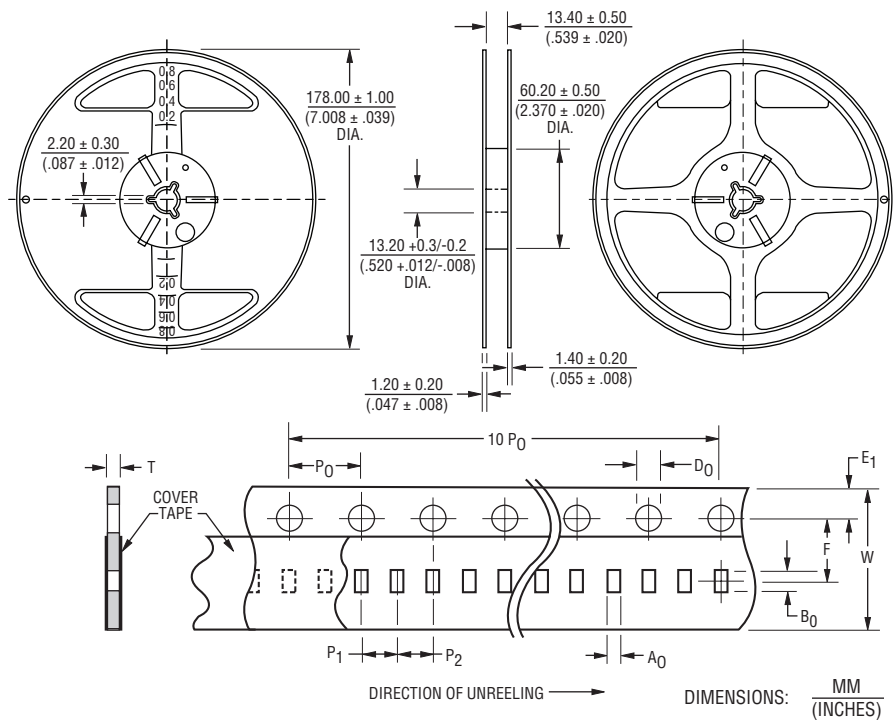
REV. D 06/18

# 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 <sub>0</sub>	$\frac{4.0 \pm 0.10}{(.157 \pm .004)}$
P <sub>1</sub>	$\frac{2.0 \pm 0.05}{(.079 \pm .002)}$
P <sub>2</sub>	$\frac{2.0 \pm 0.05}{(.079 \pm .002)}$
A <sub>0</sub>	$\frac{0.61 \pm 0.05}{(.024 \pm .002)}$
B <sub>0</sub>	$\frac{1.15 \pm 0.05}{(.045 \pm .002)}$
F	$\frac{3.50 \pm 0.05}{(.138 \pm .002)}$
E <sub>1</sub>	$\frac{1.75 \pm 0.10}{(.069 \pm .004)}$
D <sub>0</sub>	$\frac{1.50 \pm 0.10}{(.059 \pm .004)}$
T	$\frac{0.43 \pm 0.03}{(.017 \pm .001)}$

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



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