

## SinglFuse™ SF-0402SxxxM Series Features

- Single blow fuse for overcurrent protection
- 1005 (EIA 0402) miniature footprint
- Slow blow fuse (Fusing time  $\leq 5$  seconds at 250 % rated current)
- UL 248-14 listed
- Surface mount packaging for automated assembly
- Multilayer SMD design
- RoHS compliant\* and halogen free\*\*

## SF-0402SxxxM Series - Slow Blow Multilayer Surface Mount Fuses

### Electrical Characteristics

Model	Rated Current (Amps)	Fusing Time	Resistance ( $\Omega$ ) Typ.***	Rated Voltage	Breaking Capacity	Typical $I^2t$ (A <sup>2</sup> s) ****
SF-0402S050M-2	0.50	Open within 5 sec. at 250 % rated current	0.380	DC 24 V	DC 24 V 35 A	0.004
SF-0402S075M-2	0.75		0.210			0.007
SF-0402S100M-2	1.00		0.120			0.014
SF-0402S150M-2	1.50		0.056			0.050
SF-0402S200M-2	2.00		0.035			0.070
SF-0402S300M-2	3.00		0.021			0.110
SF-0402S400M-2	4.00		0.014			0.210

\*\*\* Resistance value measured with  $\leq 10$  % rated current at 25 °C ambient.

\*\*\*\*Melting  $I^2t$  calculated at 0.001 second pre-arcing time.

### Reliability Testing

No.	Test	Requirement	Test Condition	Test Reference
1	Soldering heat resistance	DCR change $\leq \pm 10$ % No mechanical damage	One dip at 260 °C for 60 seconds	MIL-STD-202 Method 210
2	Solderability	Minimum 95 % coverage	One dip at 245 °C for 5 seconds	MIL-STD-202 Method 208
3	Thermal shock	DCR change $\leq \pm 10$ % No mechanical damage	100 cycles between -65 °C and +125 °C	MIL-STD-202 Method 107
4	Moisture resistance	DCR change $\leq \pm 15$ % No excessive corrosion	10 cycles	MIL-STD-202 Method 106
5	Salt spray	DCR change $\leq \pm 10$ % No excessive corrosion	48 hour exposure, 5 % salt solution	MIL-STD-202 Method 101
6	Mechanical vibration	DCR change $\leq \pm 10$ % 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 $\leq \pm 10$ % 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 $\pm 20$ % of initial value.	80 % rated current (75 % for $\leq 1$ A fuses) for 2000 hours at ambient temperature +20 °C ~ +30 °C	Refer to STP document
9	Terminal strength	No mechanical damage	0.5 Kg pushing force	Refer to STP document

### Environmental Characteristics

Operating Temperature.....	-55 °C to +125 °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

**BOURNS®**

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\* 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-0402SxxxM 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

## SF-0402SxxxM Series - Slow Blow Multilayer Surface Mount Fuses **BOURNS®**

### Typical Part Marking

..... No part marking for this series

### Packaging Quantity

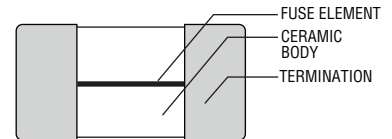
.....10,000 pieces per 7 inch reel

### How to Order

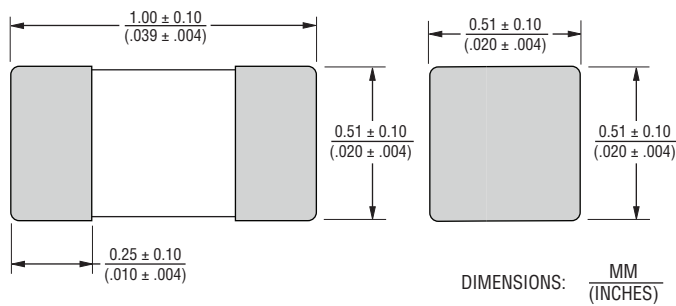
**SF - 0402 S 050 M - 2**

SingIFuse™  
 Product Designator  
 SMD Footprint  
 0402 = 1005 (EIA 0402) size  
 Fuse Blow Type  
 S = Slow blow  
 Rated Current  
 050 ~ 400 (0.50 A ~ 4.00 A)  
 Structure Type  
 M = Multilayer  
 Packaging Type  
 - 2 = Tape & Reel

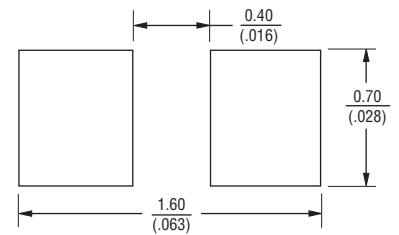
### Construction



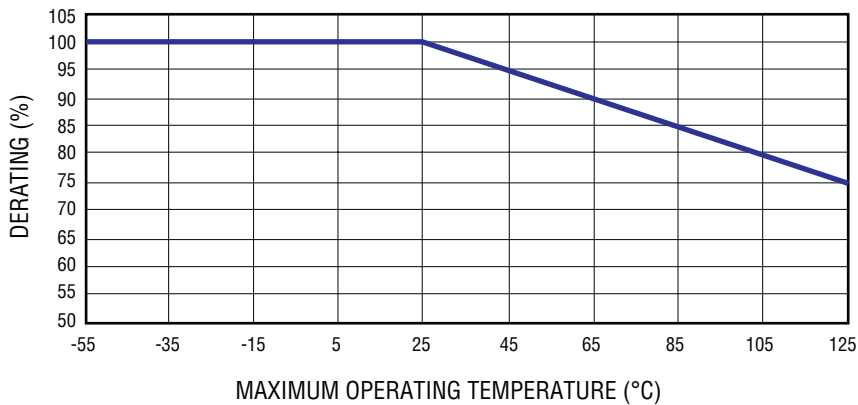
### Product Dimensions



### Recommended Pad Layout

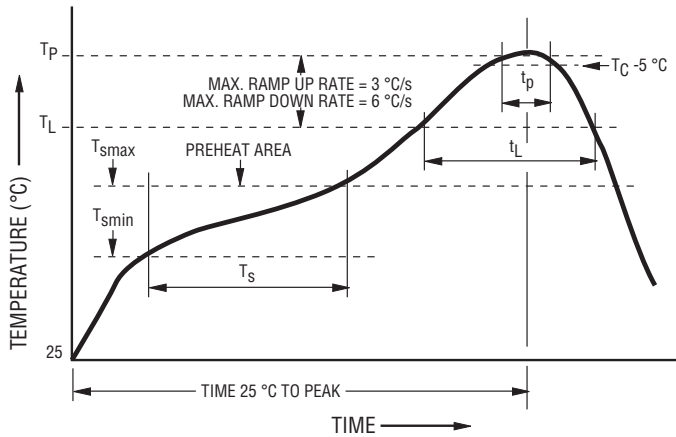


### Current Rating Thermal Derating Curve



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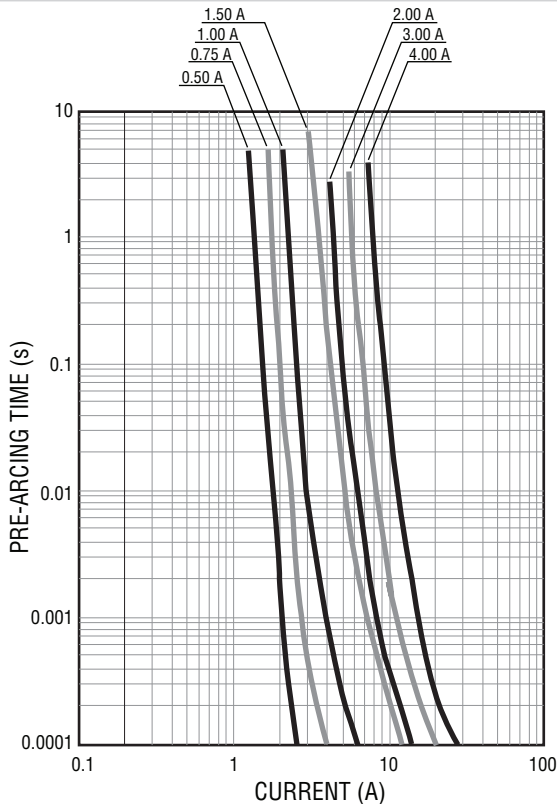
**Solder Reflow Recommendations**



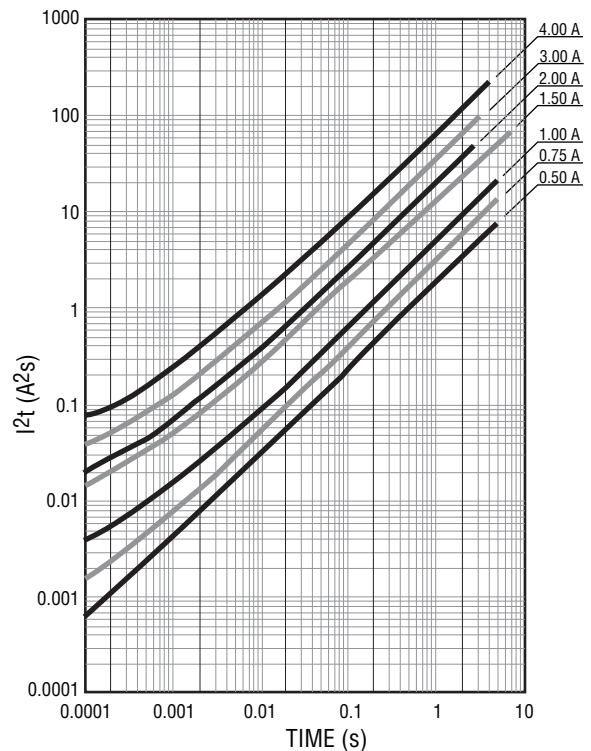
Profile Feature	Pb-Free Assembly
Preheat / Soak: Temperature Min. ( $T_{smin}$ ) Temperature Max. ( $T_{smax}$ ) Time ( $T_s$ ) from ( $t_{smin}$ to $t_{smax}$ )	150 °C 200 °C 60~120 seconds
Ramp Up Rate ( $T_L$ to $T_P$ )	3 °C / second max.
Liquidous Temperature ( $T_L$ ) Time ( $t_L$ ) maintained above $T_L$	217 °C 60~150 seconds
Peak Package Body Temperature ( $T_P$ )	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.

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



**Minimum I²t vs. t Curves**



REV. A 01/18

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# SF-0402SxxxM Series Tape and Reel Specifications

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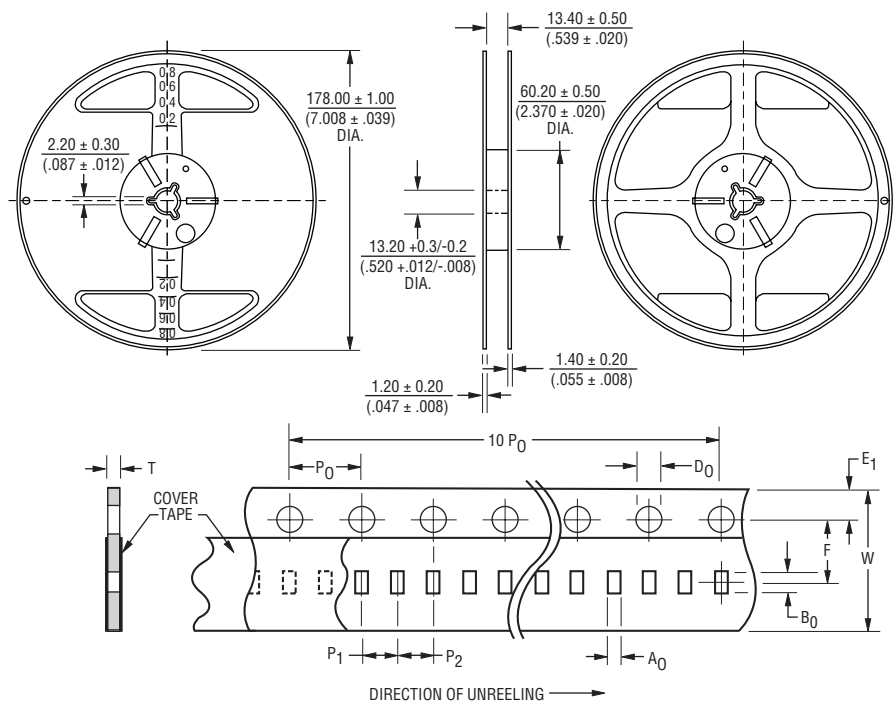
## SF-0402SxxxM Series per EIA 481-2

### Tape Dimensions

W	$\frac{8.10 \pm 0.10}{(.319 \pm .004)}$
P <sub>0</sub>	$\frac{4.0 \pm 0.10}{(.157 \pm .004)}$
P <sub>1</sub>	$\frac{2.0 \pm 0.10}{(.079 \pm .004)}$
P <sub>2</sub>	$\frac{2.0 \pm 0.05}{(.079 \pm .002)}$
A <sub>0</sub>	$\frac{0.67 \pm 0.10}{(.026 \pm .004)}$
B <sub>0</sub>	$\frac{1.17 \pm 0.10}{(.046 \pm .004)}$
F	$\frac{3.5 \pm 0.05}{(.138 \pm .002)}$
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	$\frac{0.63 \pm 0.10}{(.025 \pm .004)}$

PACKAGING: Paper tape, 10,000 pcs. per reel

DIMENSIONS:  $\frac{\text{MM}}{(\text{INCHES})}$



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