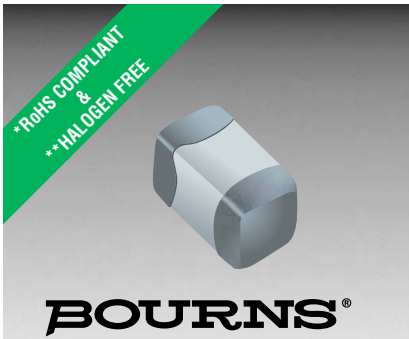




**THE DATASHEET OF  
SF-0402S400M-2**





## SinglFuse™ SF-0402S-M 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 compliant
- Surface mount packaging for automated assembly
- Multilayer SMD design
- RoHS compliant\* and halogen free\*\*

## SF-0402S-M Series - Slow Blow Multilayer Surface Mount Fuses

### Clearing Time Characteristics for Series

% of Current Rating	Clearing Time at 25 °C	
	Min.	Max.
100 %	4 hours	—
250 %	—	5 seconds
400 %	—	0.05 seconds

### Additional Information

Click these links for more information:



### Electrical Characteristics

Model	Rated Current (A)	Resistance ( $\Omega$ ) Typ.***	Rated Voltage	Interrupting Rating	Typical $I^2t$ (A <sup>2</sup> s)****	Certifications
						cUL: <a href="#">E198545</a>
SF-0402S050M-2	0.50	0.378	24 VDC	35 A @ 24 VDC	0.0041	✓
SF-0402S075M-2	0.75	0.209			0.0071	✓
SF-0402S100M-2	1.00	0.119			0.0142	✓
SF-0402S150M-2	1.50	0.0557			0.051	✓
SF-0402S200M-2	2.00	0.0348			0.071	✓
SF-0402S300M-2	3.00	0.0209			0.111	✓
SF-0402S400M-2	4.00	0.0139			0.212	✓

\*\*\* Resistance value measured with  $\leq 10$  % rated current at 25 °C ambient. Tolerance  $\pm 30$  %.

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



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**WARNING Cancer and Reproductive Harm**  
[www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)

\*RoHS Directive 2015/863, Mar 31, 2015 and Annex.

\*\*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.

Users should verify actual device performance in their specific applications.

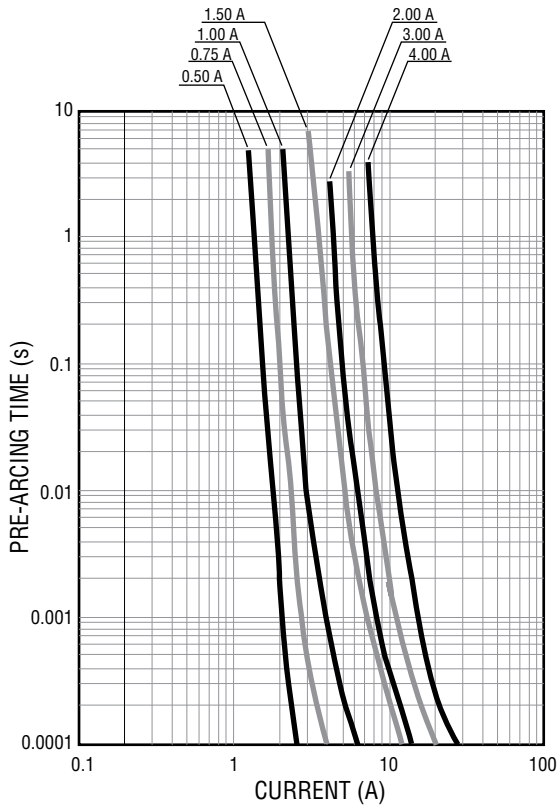
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# SinglFuse™ SF-0402S-M Series Applications

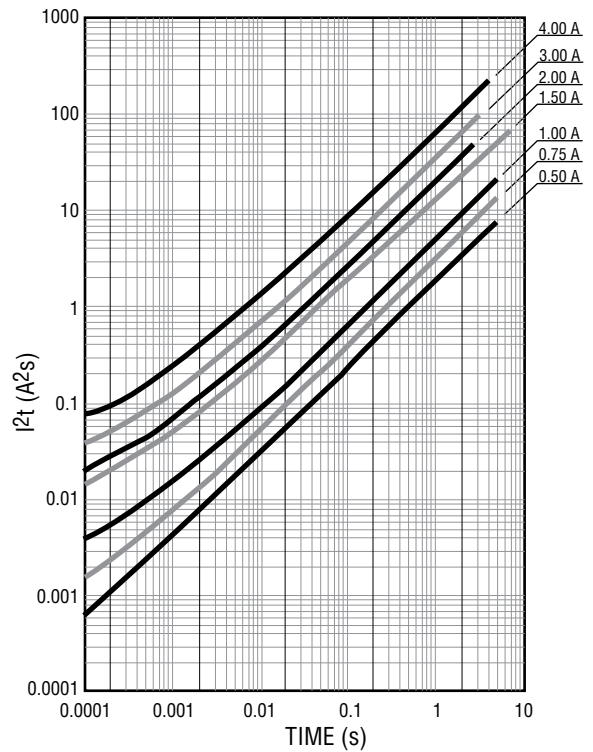
- Portable memory
- LCD monitors
- Disk drives
- PDAs
- Digital cameras
- MP3 players
- Cell phones
- Rechargeable battery packs
- Battery chargers
- Set-top boxes
- Industrial controllers
- Battery Management Systems (BMS)
- LED lighting
- Power tools

## SF-0402S-M Series - Slow Blow Multilayer Surface Mount Fuses BOURNS®

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



**Average I²t vs. t Curves**



### 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

### Typical Part Marking

No part marking for this series

### Packaging

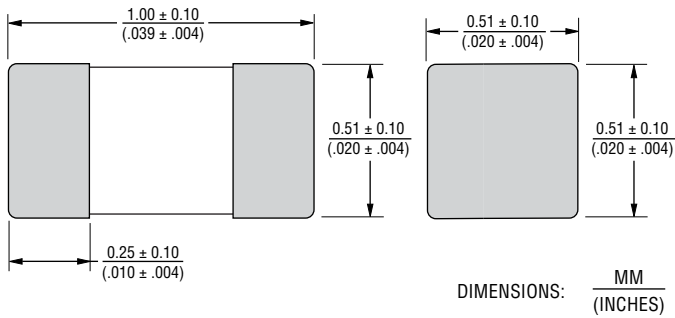
<b>Reel Dimension</b>	7-inch Tape and Reel
<b>Specification</b>	EIA 481-2
<b>Quantity</b>	10,000 pieces
<b>Packaging Code</b>	-2

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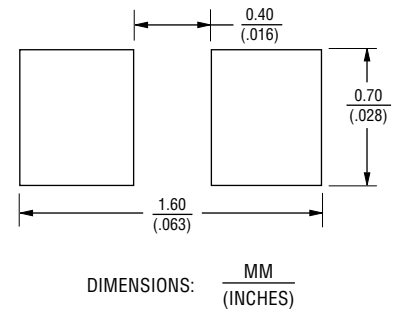
# SF-0402S-M Series - Slow Blow Multilayer Surface Mount Fuses



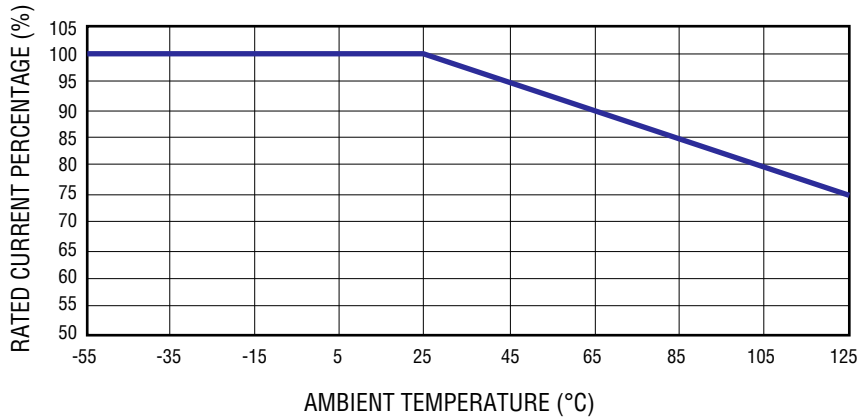
## Product Dimensions



## Recommended Pad Layout



## Current Rating Thermal Derating Curve



## How to Order

SF - 0402 S 050 M - 2

SinglFuse™ 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

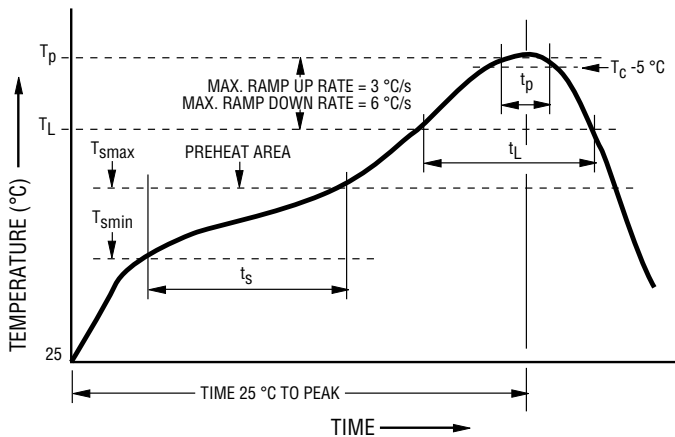
Packaging Type \_\_\_\_\_  
- 2 = Tape & Reel

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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.

**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

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