



## SingIFuse™ SF-0603SP-M Series Features

- Single blow fuse for overcurrent protection
- 1608 (EIA 0603) miniature footprint
- Time Lag fuse
- UL 248-14 compliant
- RoHS compliant\* and halogen free\*\*
- Multilayer SMD design
- Surface mount packaging for automated assembly

### SF-0603SP-M Series - Time Lag Multilayer Surface Mount Fuses

#### Clearing Time Characteristics for Series

% of Current Rating	Clearing Time at 25 °C	
	Min.	Max.
100 %	4 hours	—
200 %	1 second	120 seconds
300 %	0.1 seconds	3 seconds
800 % (1 A - 1.5 A)	0.0005 seconds	0.05 seconds
800 % (2 A - 8 A)	0.001 seconds	0.05 seconds

#### Additional Information

Click these links for more information:



#### Electrical Characteristics

Model	Rated Current (A)	Resistance (Ω) Typ.***	Rated Voltage	Interrupting Rating	Typical I <sup>2</sup> t (A <sup>2</sup> s) ****	Certifications
						cUL: <a href="#">E198545</a>
SF-0603SP100M-2	1.00	0.1990	32 VDC	50 A @ 32 VDC	0.0944	✓
SF-0603SP150M-2	1.50	0.0995			0.182	✓
SF-0603SP200M-2	2.00	0.0517			0.323	✓
SF-0603SP250M-2	2.50	0.0408			0.636	✓
SF-0603SP300M-2	3.00	0.0308			0.879	✓
SF-0603SP350M-2	3.50	0.0209			1.21	✓
SF-0603SP400M-2	4.00	0.0169			2.32	✓
SF-0603SP450M-2	4.50	0.0149			2.73	✓
SF-0603SP500M-2	5.00	0.0129			3.23	✓
SF-0603SP600M-2	6.00	0.0100		4.0	✓	
SF-0603SP700M-2	7.00	0.0080		5.1	✓	
SF-0603SP800M-2	8.00	0.0060		7.1	✓	

\*\*\* Resistance value measured with ≤10 % rated current at 25 °C ambient. Tolerance ±30 %.

\*\*\*\* Melting I<sup>2</sup>t 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.

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Specifications are subject to change without notice.

Users should verify actual device performance in their specific applications.

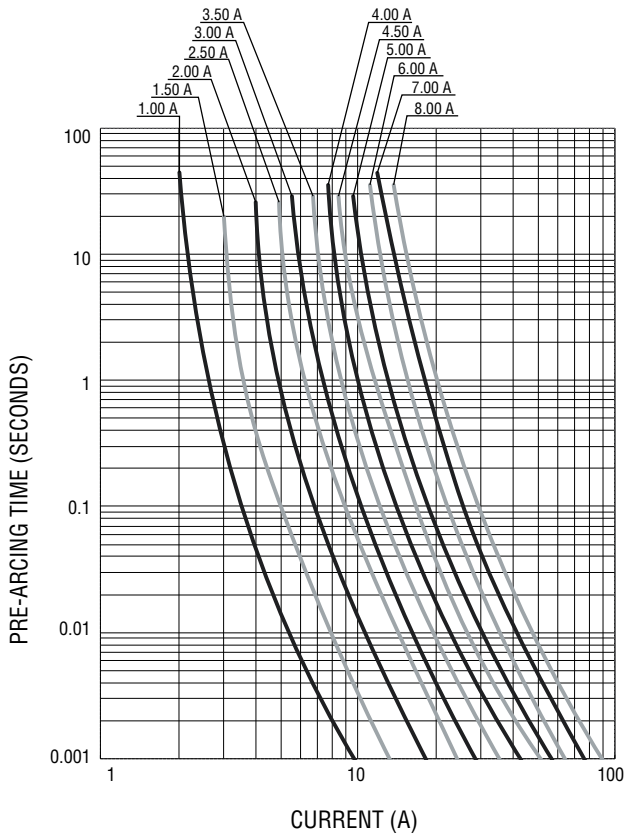
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# SinglFuse™ SF-0603SP-M Series Applications

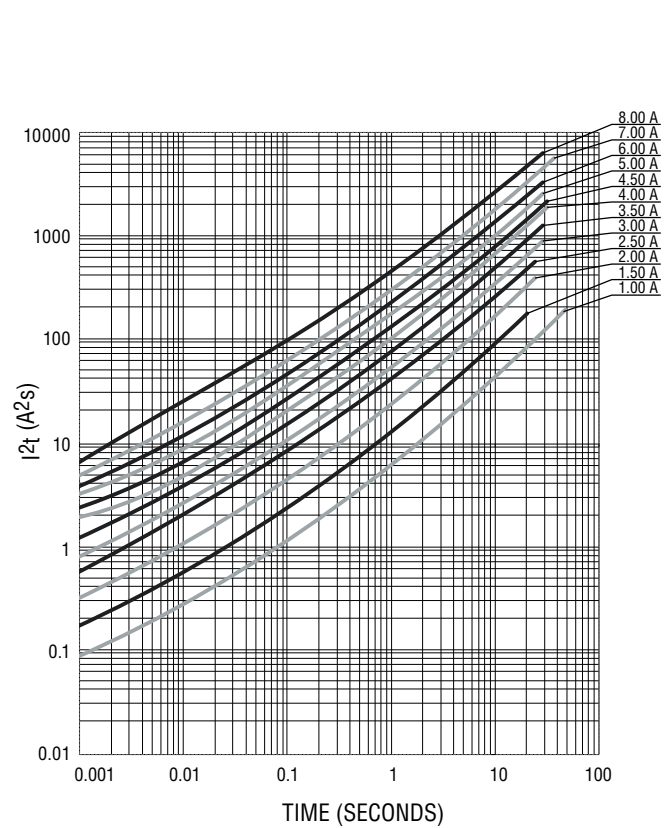
- Portable memory
- LCD monitors
- Disk drives
- PDAs
- Digital cameras
- MP3 players
- Cellphones
- Rechargeable battery packs
- Battery chargers
- Set-top boxes
- Industrial controllers
- Battery Management Systems (BMS)
- LED lighting
- Power tools

**SF-0603SP-M Series - Time Lag 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

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# SF-0603SP-M Series - Time Lag Multilayer Surface Mount Fuses



## Typical Part Marking

Represents total content. Layout may vary.



RATED CURRENT (A)  
 E = 1.00 M = 4.00  
 G = 1.50 T = 4.50  
 I = 2.00 N = 5.00  
 J = 2.50 O = 6.00  
 K = 3.00 P = 7.00  
 L = 3.50 R = 8.00

## How to Order

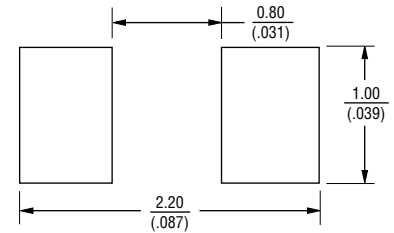
**SF - 0603 SP 100 M - 2**

SinglFuse™  
 Product Designator  
 SMD Footprint  
 0603 = 1608 (EIA 0603) size  
 Fuse Blow Type  
 SP = Time Lag  
 Rated Current  
 100 ~ 800 (1.00 A ~ 8.00 A)  
 Structure Type  
 M = Multilayer  
 Packaging Type  
 - 2 = Tape & Reel

## Packaging

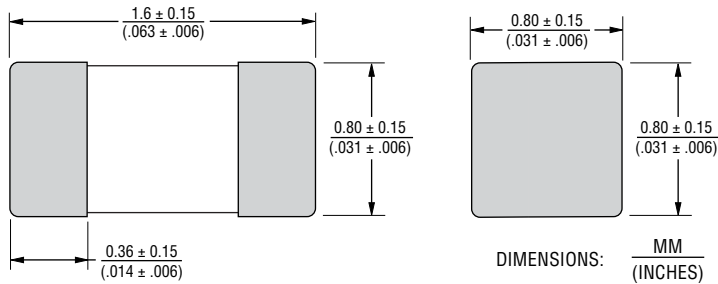
Reel Dimension	7-inch Tape and Reel
Specification	EIA 481-2
Quantity	4,000 pieces
Packaging Code	-2

## Recommended Pad Layout

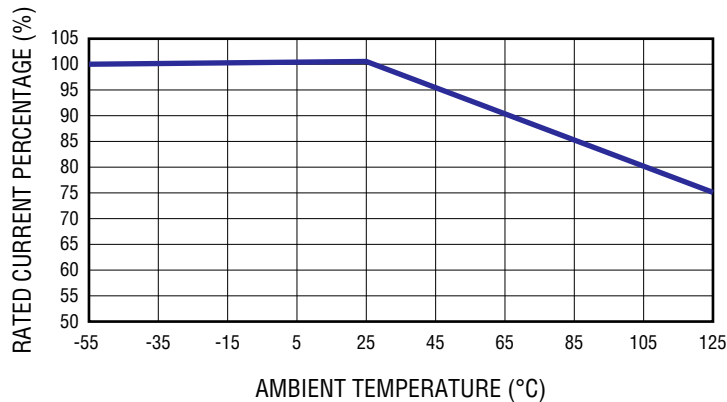


DIMENSIONS:  $\frac{\text{MM}}{\text{(INCHES)}}$

## Product Dimensions



## Current Rating Thermal Derating Curve

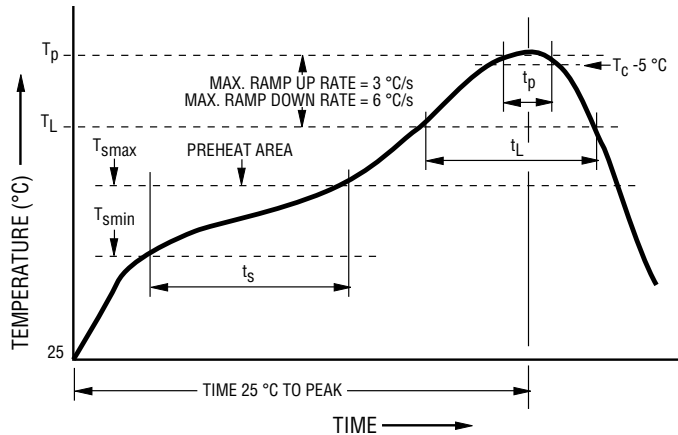


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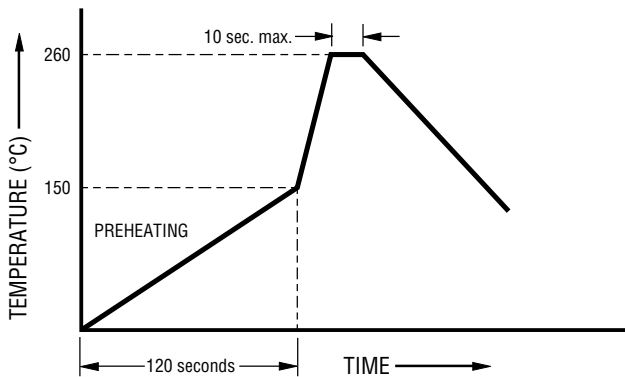
**Solder Reflow Recommendations**



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.

**Recommended Temperature Profile for Wave Soldering**



Wave soldering is suitable for 0603 size models.

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**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 < 1 A fuses) for 2000 hours at ambient temperature between +20 °C and +30 °C	Refer to STP document

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