



### Features

- High-inrush current withstand capability
- EIA 0603 (1608 metric) footprint
- AEC-Q200 compliant\*
- UL 248-14 listed
- RoHS compliant\*\* and halogen free\*\*\*

## SF-0603HIA-M Series - Automotive Grade High-Inrush SMD Fuses

### Clearing Time Characteristics for Series

% of Current Rating	Clearing Time @ 25 °C	
	Min.	Max.
100 %	4 hours	—
200 %	1 second	60 seconds

### Additional Information

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### 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-0603HIA100M-2	1.0	0.24	32 VDC	50 A @ 32 VDC	0.082	✓
SF-0603HIA150M-2	1.5	0.115			0.112	✓
SF-0603HIA200M-2	2.0	0.06			0.245	✓
SF-0603HIA300M-2	3.0	0.032			0.74	✓
SF-0603HIA350M-2	3.5	0.022			1.12	✓
SF-0603HIA400M-2	4.0	0.018			2.1	✓
SF-0603HIA450M-2	4.5	0.015			2.68	✓
SF-0603HIA500M-2	5.0	0.013			3.3	✓

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

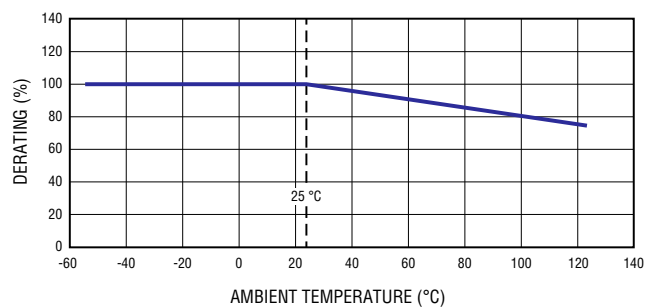
\*\*\*\*\* Melting I<sup>2</sup>t calculated at 1000 % of current rating.

### Environmental Characteristics

Operating Temperature	-55 °C to + 125 °C
Storage Conditions	
Temperature	+5 °C to +35 °C
Humidity	40 % to 75 %
Moisture Sensitivity Level	1
ESD Classification <sup>1</sup>	Class 6

<sup>1</sup>per AEC-Q200-2, HBM

### Current Rating Thermal Derating Curve



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

\* Meets Bourns' internal AEC-Q200 equivalent test plan.

\*\* 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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# SF-0603HIA-M Series – Automotive Grade High-Inrush SMD Fuses



## Typical Part Marking

Represents total content. Layout may vary.  
Markings in green color.



Rated Current	Part Marking	Rated Current	Part Marking
1 A	E	3.5 A	L
1.5 A	G	4 A	M
2 A	I	4.5 A	T
3 A	K	5 A	N

## How to Order

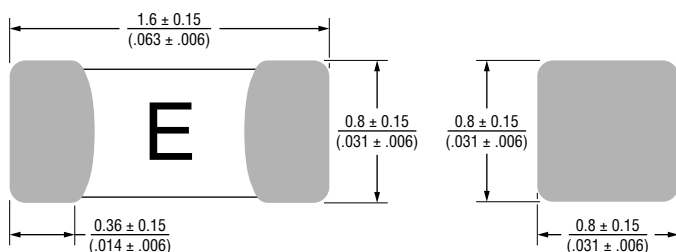
**SF - 0603 HI A 100 M - 2**

SinglFuse™ \_\_\_\_\_  
 Product Designator \_\_\_\_\_  
 SMD Footprint \_\_\_\_\_  
 0603 = EIA 0603  
 (1608 metric) \_\_\_\_\_  
 Fuse Blow Type \_\_\_\_\_  
 HI = High Inrush  
 Current Withstand \_\_\_\_\_  
 Automotive Grade \_\_\_\_\_  
 Rated Current \_\_\_\_\_  
 100 ~ 500 = 1 A ~ 5 A \_\_\_\_\_  
 Structure Type \_\_\_\_\_  
 M = Ceramic Multilayer \_\_\_\_\_  
 Packaging Type \_\_\_\_\_  
 - 2 = Tape & Reel \_\_\_\_\_

## Packaging

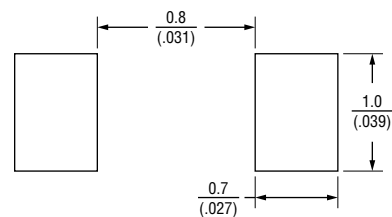
Reel Dimension	7-inch Tape and Reel
Specification	EIA 481-2
Quantity	4,000 pieces
Packaging Code	-2

## Product Dimensions



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

## Recommended Pad Layout



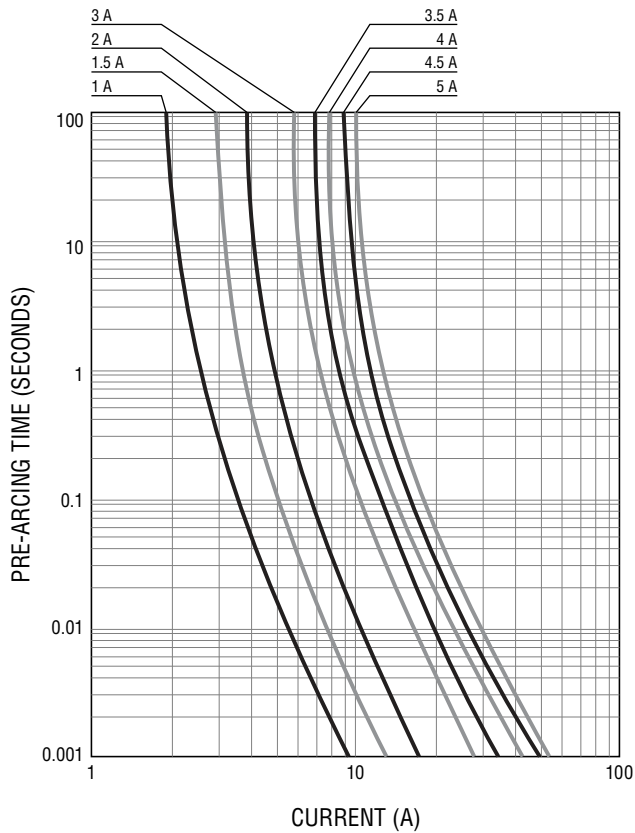
DIMENSIONS:  $\frac{\text{MM}}{\text{(INCHES)}}$

Specifications are subject to change without notice.

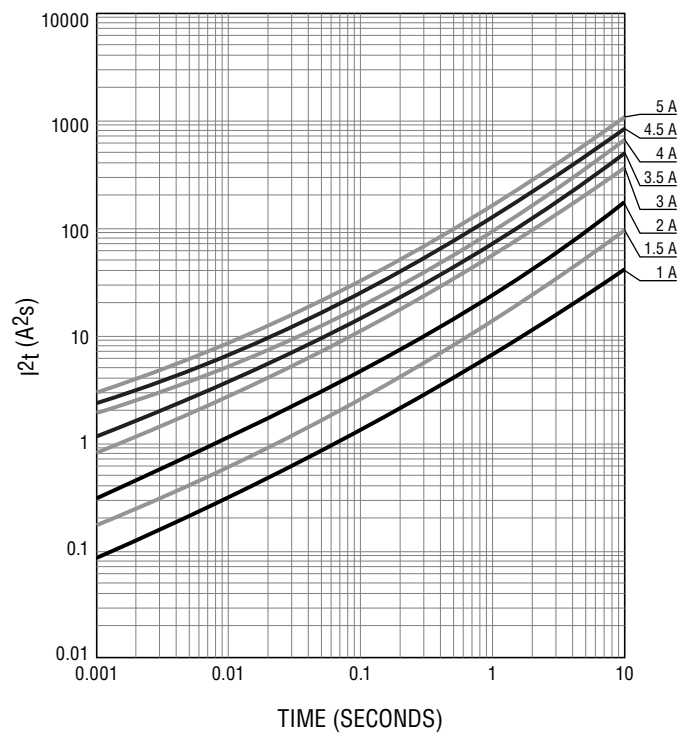
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Average Pre-Arcing Time vs. Current Curves



Average  $I^2t$  vs.  $t$  Curves



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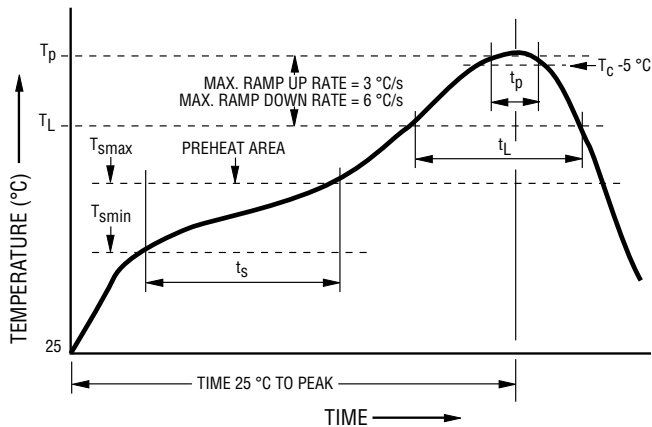
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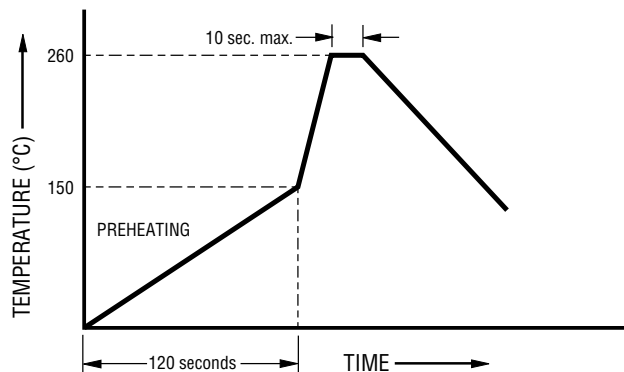
**Solder Reflow Recommendations**



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.

**Solder Wave Recommendations**



**Reliability Tests**

Test Items	Reference Standard
Visual Inspection	MIL-STD-883 Method 2009
High Temperature Storage	MIL-STD-202 Method 108
Low Temperature Storage	IEC 60068-2-1
Temperature Cycling	JESD22 Method JA-104
Biased Humidity	MIL-STD-202 Method 103
High Temperature Operating Life	MIL-STD-202 Method 108
Physical Dimension	JESD22 Method JB-100
Mechanical Vibration	MIL-STD-202 Method 204
Mechanical Shock	MIL-STD-202 Method 213
Resistance to Soldering Heat	MIL-STD-202 Method 210
Salt Spray	MIL-STD-202 Method 101
Solderability	MIL-STD-202 Method 208
Terminal Strength	AEC-Q200-006
Board Flex	AEC-Q200-005
Pull Test	MIL-STD-202 Method 211
Electrical Characterization	Bourns Specification

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