



## SinglFuse™ SF-0603FPxxxM Series Features

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

## SF-0603FPxxxM 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-0603FP050M-2	0.50	Open within 5 sec. at 200 % rated current	0.995	DC 32 V	DC 32 V 50 A	0.0094
SF-0603FP075M-2	0.75		0.448			0.0194
SF-0603FP100M-2	1.00		0.2786			0.0365
SF-0603FP125M-2	1.25		0.2040		DC 32 V 35 A	0.0636
SF-0603FP150M-2	1.50		0.1423			0.0960
SF-0603FP175M-2	1.75		0.0945			0.141
SF-0603FP200M-2	2.00		0.0726			0.212
SF-0603FP250M-2	2.50		0.0458			0.303
SF-0603FP300M-2	3.00		0.0388			0.465
SF-0603FP350M-2	3.50		0.0279			0.737
SF-0603FP400M-2	4.00		0.0229			1.162
SF-0603FP450M-2	4.50		0.0189			1.697
SF-0603FP500M-2	5.00		0.0149			2.646

\*\*\* 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.

### Reliability Testing

No.	Test	Requirement	Test Condition	Test Reference
1	Soldering heat resistance	DCR change ≤ ±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 ≤ ±10 % No mechanical damage	100 cycles between -65 °C and +125 °C	MIL-STD-202 Method 107
4	Moisture resistance	DCR change ≤ ±15 % 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	MIL-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 ±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

### Agency Recognition

UL File Number ..... E198545



**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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# SingIFuse™ SF-0603FPxxxM 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

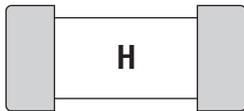
## SF-0603FPxxxM Series - Fast Acting Precision Surface Mount Fuses **BOURNS®**

### 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

Represents total content. Layout may vary.



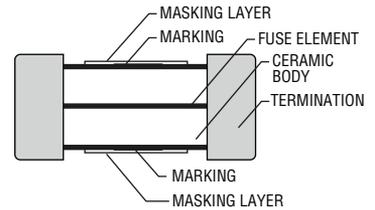
RATED CURRENT (A)	
C = 0.50	J = 2.50
D = 0.75	K = 3.00
E = 1.00	L = 3.50
F = 1.25	M = 4.00
G = 1.50	T = 4.50
H = 1.75	N = 5.00
I = 2.00	

### How to Order

**SF - 0603 FP 050 M - 2**

SingIFuse™  
 Product Designator  
 SMD Footprint  
   0603 = 1608 (EIA 0603) size  
 Fuse Blow Type  
   FP = Fast acting precision  
 Rated Current  
   050 ~ 500 (500 mA ~ 5.00 A)  
 Structure Type  
   M = Multilayer  
 Packaging Type  
   - 2 = Tape & Reel

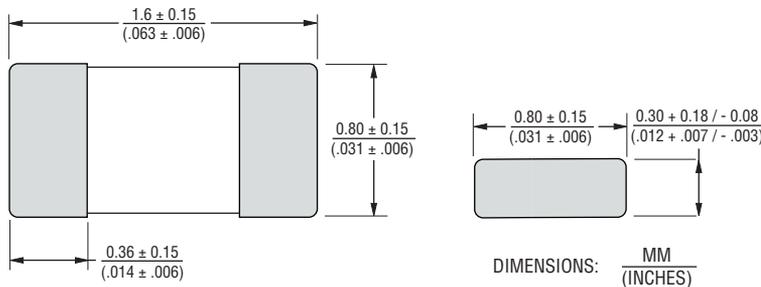
### Construction



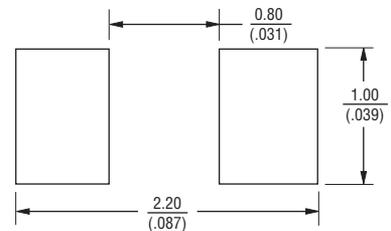
### Packaging Quantity

6,000 pieces per 7-inch reel

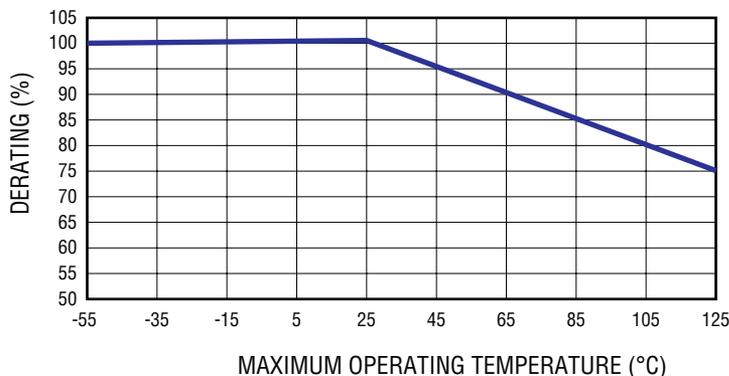
### Product Dimensions



### Recommended Pad Layout

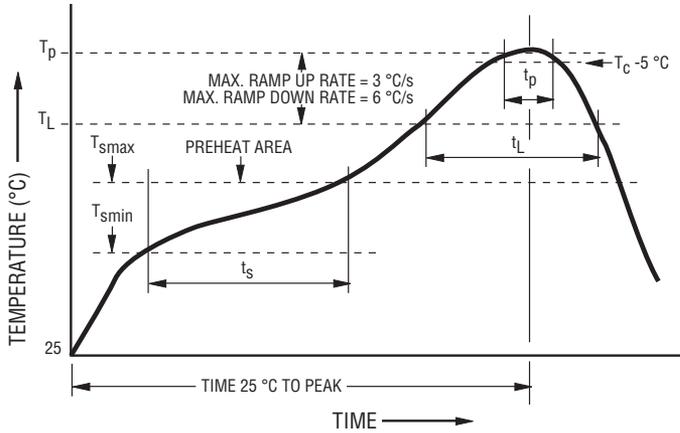


### Current Rating Thermal Derating Curve



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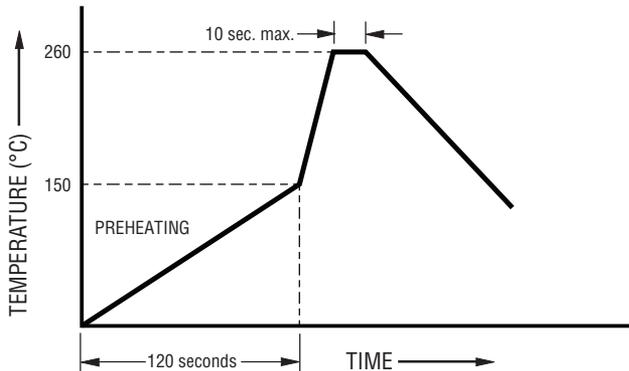
**Solder Reflow Recommendations**



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 $T_d$ )	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.

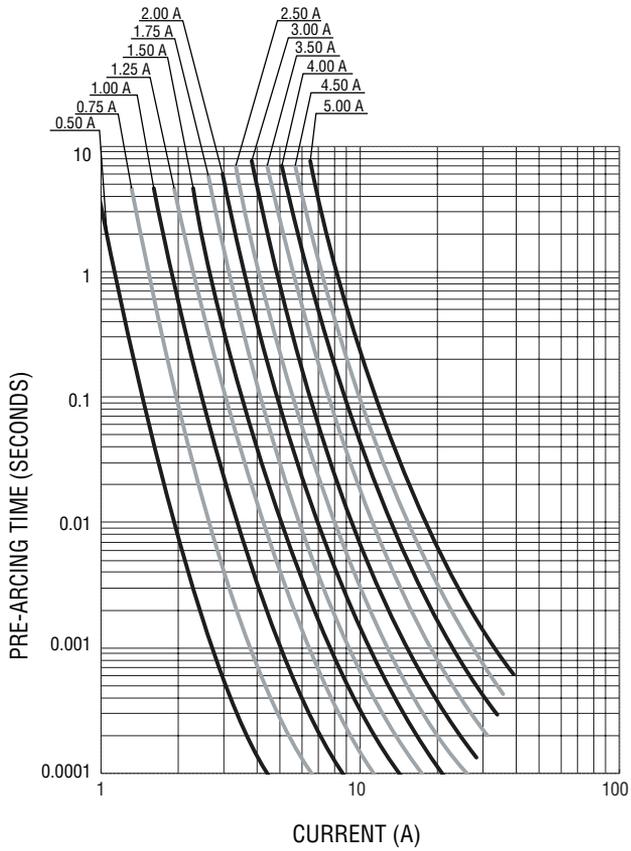
\* Tolerance for peak profile temperature ( $T_p$ ) is defined as a supplier minimum and a user maximum.

**Recommended Temperature Profile for Wave Soldering**

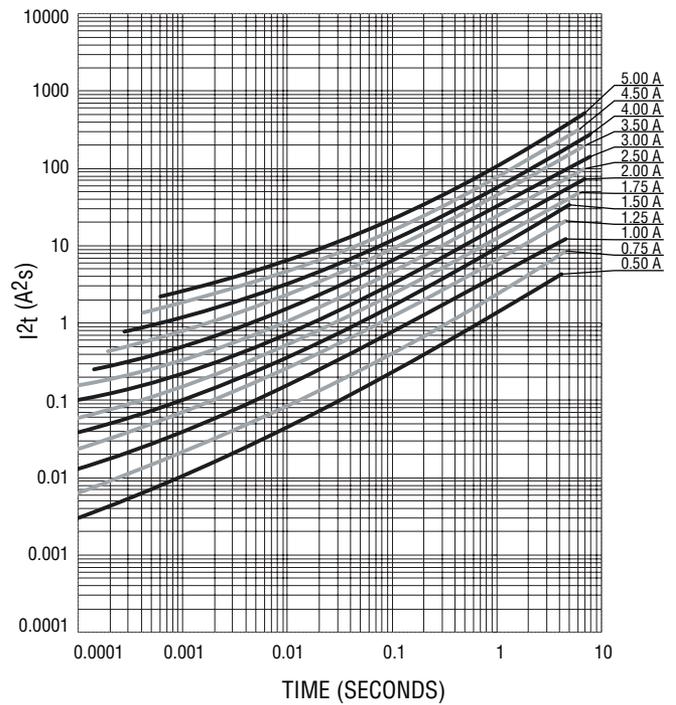


Wave soldering is suitable for 0603 size models.

Average Pre-Arcing Time vs. Current Curves



Average  $I^2t$  vs. t Curves





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