



SinglFuse™ SF-0603SPxxxM Series Features

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

SF-0603SPxxxM Series - Time Lag Multilayer Surface Mount Fuses

Electrical Characteristics

Model	Rated Current (Amps)	Fusing Time	Resistance (Ω) Typ.***	Rated Voltage	Interrupting Rating	Typical I ² t (A ² s) ****
SF-0603SP100M-2	1.00	Open within 1~120 sec. at 200 % rated current	0.1990	DC 32 V 50 A	DC 32 V 50 A	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 $\leq 10\%$ rated current at 25 °C ambient. Tolerance $\pm 30\%$.

**** Melting I²t calculated at 0.001 second pre-arc 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 $< 1\text{ A}$ 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

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* 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-0603SPxxxM 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-0603SPxxxM Series - Time Lag Multilayer Surface Mount Fuses

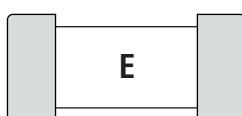
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Environmental Characteristics

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.

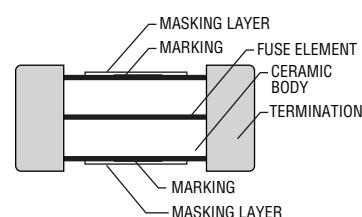


RATED CURRENT (A)
E = 1.00 M = 4.00
G = 1.50 T = 4.50
I = 2.00 N = 5.00
J = 2.50 O = 6.00
K = 3.00 P = 7.00
L = 3.50 R = 8.00

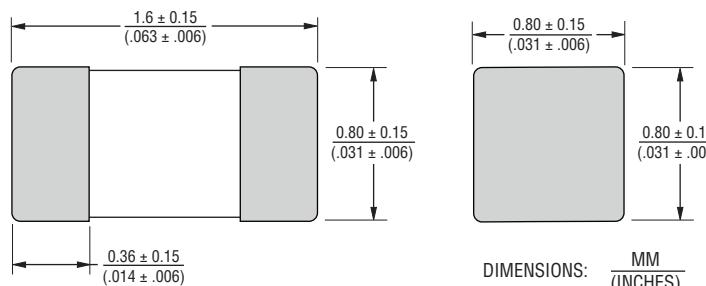
How to Order

SinglFuse™
Product Designator SF - 0603 SP 100 M - 2
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

Construction



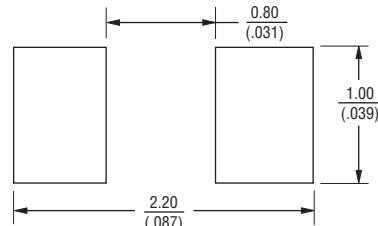
Product Dimensions



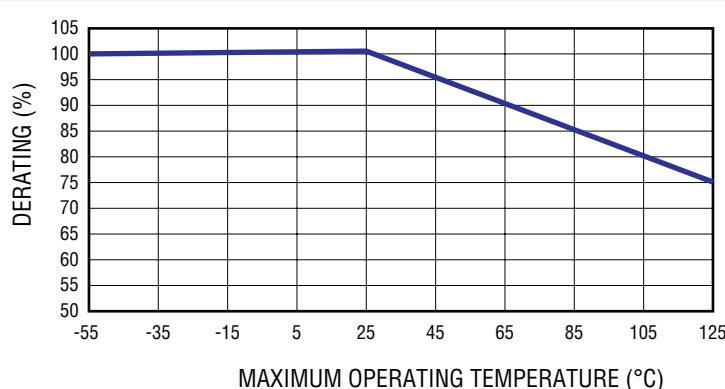
Packaging Quantity

4,000 pieces per 7-inch reel

Recommended Pad Layout



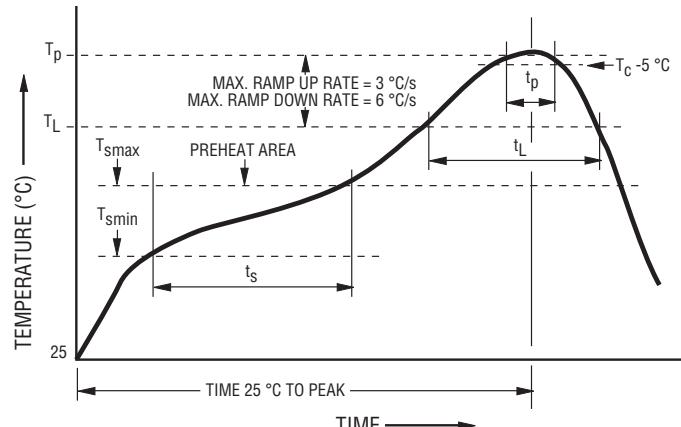
Current Rating Thermal Derating Curve



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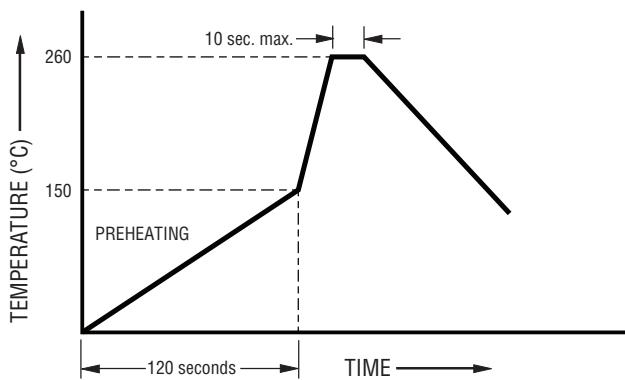
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Solder Reflow Recommendations

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.

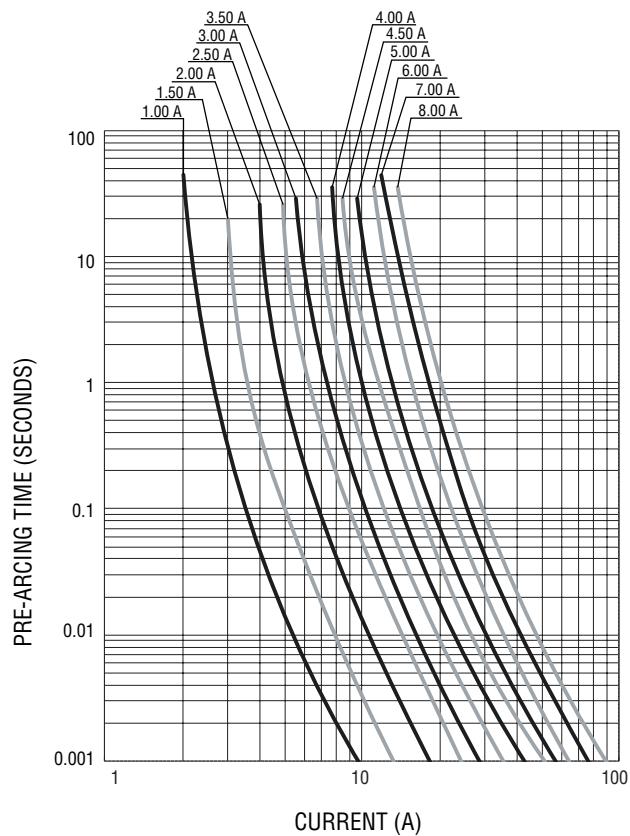
Recommended Temperature Profile for Wave Soldering

Wave soldering is suitable for 0603 size models.

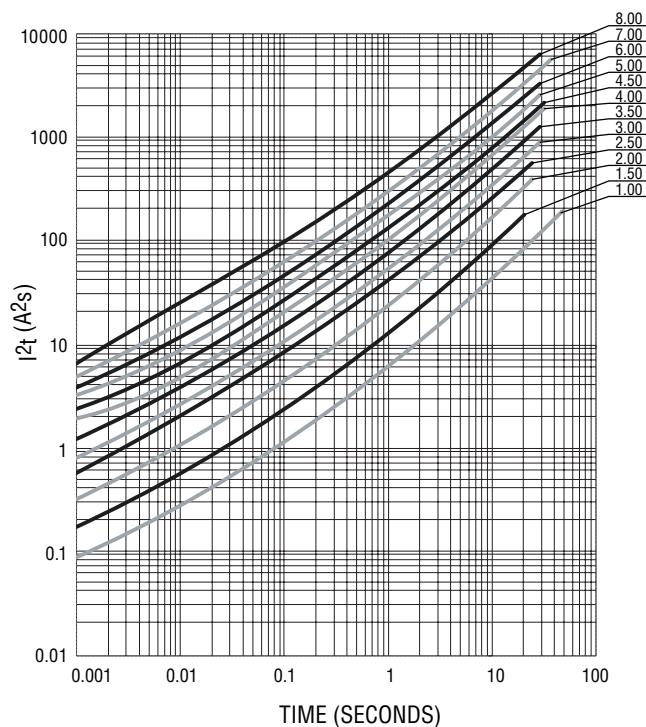
SF-0603SPxxxM Series - Time Lag Multilayer Surface Mount Fuses

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Average Pre-Arcing Time vs. Current Curves



Average I^2t vs. t Curves



SF-0603SPxxxM Series Tape and Reel Packaging Specifications

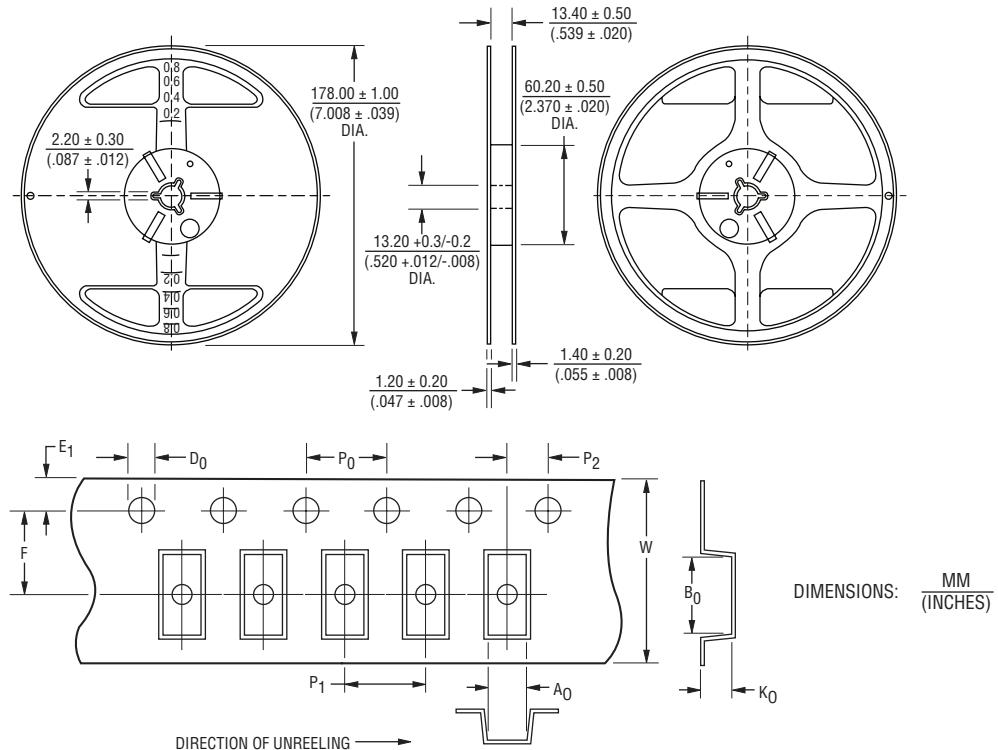
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SF-0603SPxxxM Series per EIA 481-2

Tape Dimensions

W	8.00 ± 0.10 (.315 ± .004)
P ₀	4.0 ± 0.10 (.157 ± .004)
P ₁	4.0 ± 0.10 (.157 ± .004)
P ₂	2.0 ± 0.05 (.079 ± .002)
A ₀	1.00 ± 0.10 (.039 ± .004)
B ₀	1.80 ± 0.10 (.071 ± .004)
F	3.5 ± 0.05 (.138 ± .002)
E ₁	1.75 ± 0.10 (.069 ± .004)
D ₀	1.50 ± 0.10 (.059 ± .004)

PACKAGING: Paper tape, 4,000 pcs. per reel



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