



## Features

- Metal foil chip design for overcurrent protection
- EIA 0603 (1608 metric) footprint
- Small chip size with high current rating and inrush withstanding capability

- Agency recognition:  
- RoHS\* compliant and halogen free\*\*
- AEC-Q200 compliant\*\*\*

## SF-0603SPA-R Series – Automotive Grade SMD Fuses

### Clearing Time Characteristics for Series

% of Current Rating	Clearing Time at 25 °C	
	Min.	Max.
100 %	4 hours	—
200 %	1 second	120 seconds

### Additional Information

Click these links for more information:



### Electrical Characteristics

Model	Rated Current (A)	Resistance (Ω) Typ. <sup>1</sup>	Rated Voltage <sup>1</sup>	Interrupting Rating <sup>2</sup>	Typical I <sup>2</sup> t (A <sup>2</sup> s) <sup>3</sup>	Agency Recognition	
						cUL: <a href="#">E198545</a>	TÜV: <a href="#">TA50515766</a>
SF-0603SPA100R-2	1.0	0.115	50 VDC 63 VDC	50 A @ 50 VDC 50 A @ 63 VDC	0.059	✓	✓
SF-0603SPA150R-2	1.5	0.059			0.13	✓	✓
SF-0603SPA200R-2	2.0	0.033			0.21	✓	✓
SF-0603SPA300R-2	3.0	0.0159			0.71	✓	✓
SF-0603SPA400R-2	4.0	0.01			0.96	✓	✓
SF-0603SPA500R-2	5.0	0.00677			2.05	✓	✓
SF-0603SPA600R-2	6.0	0.0063			3.47	✓	✓
SF-0603SPA700R-2	7.0	0.0047			5.04	✓	✓
SF-0603SPA800R-2	8.0	0.0043			6.5	✓	✓

Notes:

1. Resistance value measured with ≤10 % rated current at 25 °C ambient. Tolerance ±25 %.
2. UL: 50 A @ 63 VDC / TÜV: 50 A @ 50 VDC
3. 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.

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

“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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# SF-0603SPA-R Series – Automotive Grade SMD Fuses

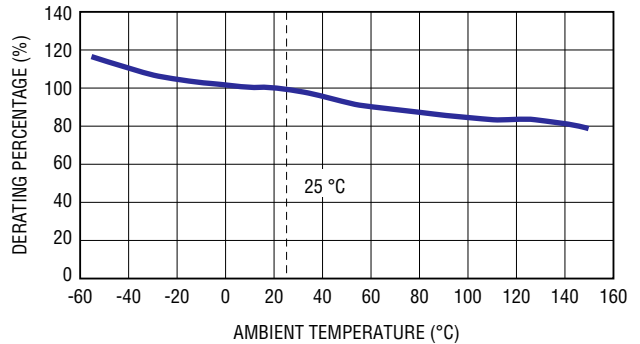


## Environmental Characteristics

Operating Temperature	-55 °C to +150 °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



## Typical Part Marking

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



Rated Current	Part Marking	Rated Current	Part Marking
1 A	L	5 A	Y
1.5 A	P	6 A	6
2 A	S	7 A	Z
3 A	3	8 A	8
4 A	W		

## How to Order

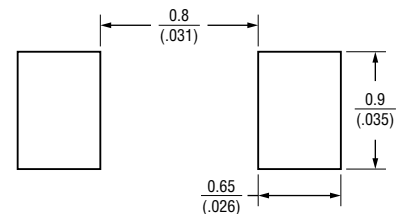
### SF - 0603 SP A 100 R - 2

SinglFuse™ \_\_\_\_\_  
 Product Designator \_\_\_\_\_  
 SMD Footprint \_\_\_\_\_  
 0603 = EIA 0603 (1608 metric)  
 Fusing Characteristic \_\_\_\_\_  
 SP = 1~120 sec. @ 200 % I<sub>n</sub>  
 Automotive Grade \_\_\_\_\_  
 Rated Current \_\_\_\_\_  
 100~800 = 1 A~8 A  
 Structure Type \_\_\_\_\_  
 R = Metal Foil  
 Packaging Type \_\_\_\_\_  
 - 2 = Tape & Reel

## Packaging

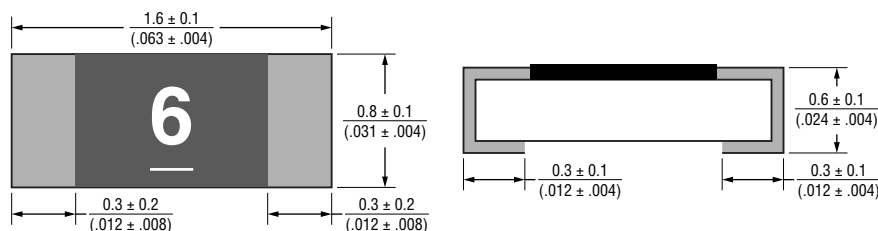
Reel Dimension	7-inch Tape and Reel
Specification	EIA 481-2
Quantity	5,000 pieces
Packaging Code	-2

## Recommended Pad Layout



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

## Product Dimensions



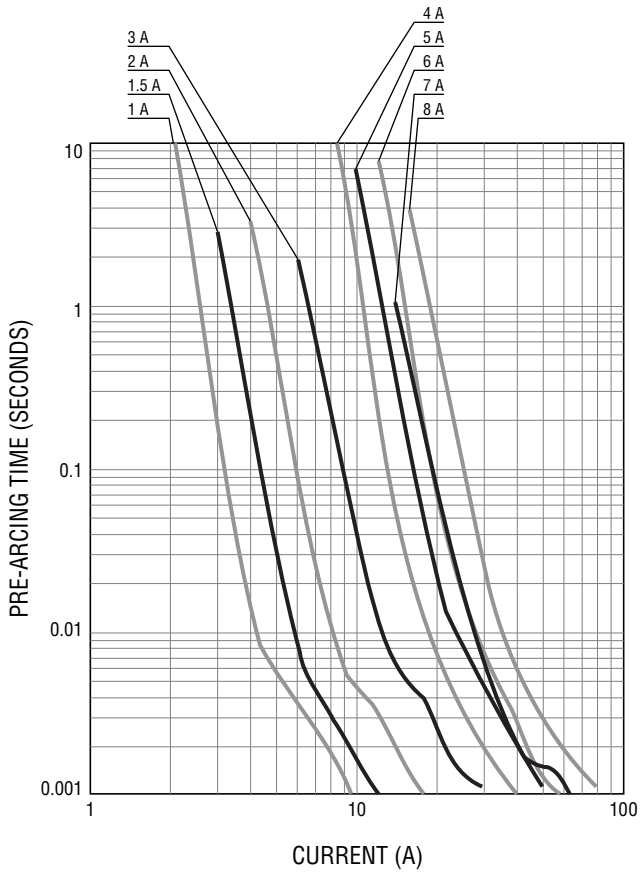
DIMENSIONS:  $\frac{\text{MM}}{\text{(INCHES)}}$

Specifications are subject to change without notice.

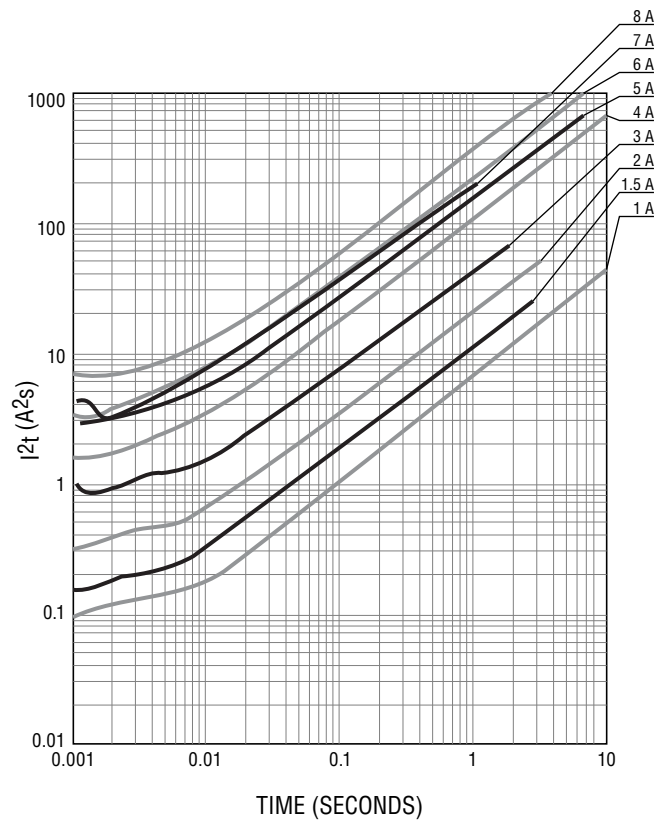
Users should verify actual device performance in their specific applications.

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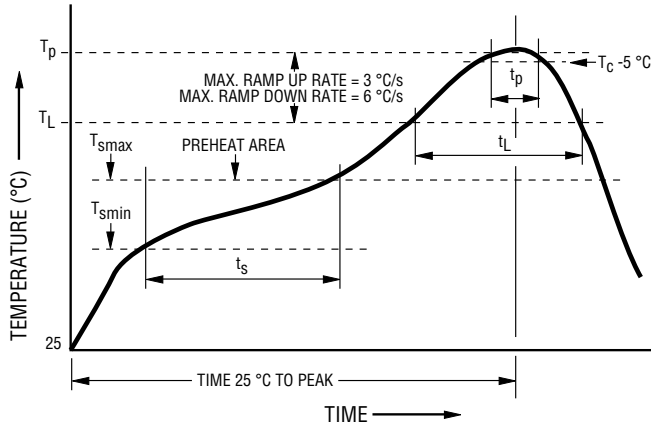
Average Pre-Arcing Time vs. Current Curves



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



## 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 Tests

Test Items	Reference Standard
Solderability	J-STD-002; Condition B
Resistance to Soldering Heat	MIL-STD-202; Method 210; Condition B
Moisture Resistance	MIL-STD-202; Method 106
Thermal Shock	MIL-STD-202; Method 107; Condition B
Mechanical Shock	MIL-STD-202; Method 213; Condition A
Vibration	MIL-STD-202; Method 201
Terminal Strength	IEC 60115-1 4.32
High Temperature Storage	MIL-STD-202; Method 108
Temperature Cycling	JESD22 Method JA-104, Test Conditions B and N
Bias Humidity	MIL-STD-202; Method 103
Operational Life	MIL-STD-202; Method 108; Condition D
Resistance to Solvent	MIL-STD-202; Method 215
Board Flex (Bending)	AEC-Q200-005
Carrying Capacity	UL 248-14
Fusing Time	UL 248-14
Interrupting Ability	UL 248-14
Temperature Rise	UL 248-14
Residual Resistance	UL 248-14
Low Temperature Storage	JESD22-A119

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