

**PRODUCT  
DATASHEET**

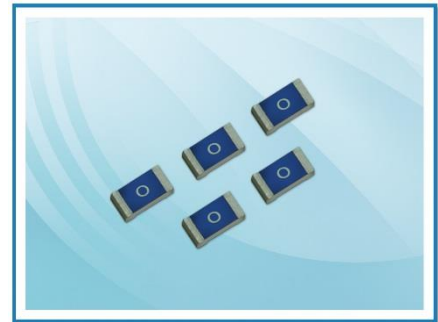


**SMFS0603 Series Surface Mount Fuses Devices**

## SMFS0603 Series Surface Mount Fuses Devices

### Description

Polytronics SMFS0603 series surface mount slow-blow fuse utilizes thick film process with extremely stable fusing element. The glass over coating can tolerate higher temperature profile, and the non-flammable ceramic substrate offers better heat conductivity and safety. SMFS0603 series is also RoHS compliant and halogen-free to meet global environmental standard





### Features

- Slow-blow capability
- Compact size
- Thick film manufacturing method
- Ceramic substrate with silver fusing element
- Excellent environmental integrity


### Application

- Battery packs
- Digital camera
- Game equipments
- Wireless base station
- LCD monitors and modules
- PC related equipment / peripherals
- Portable devices (Mobile phone, PDA battery charger, etc.)

### Agency Approval and Environmental Compliance

Agency	File Number	Regulation	Standard
	UL/CSA:E331807		2011/65/EU
			IEC 61249-2-21:2003

### Electrical Characteristics

Part Number	Marking	Current Rating (A)	Voltage Rating	Interrupting Rating	Max Cold DCR† (Ω)	Typical I <sup>2</sup> T‡ (A <sup>2</sup> S)	Agency Approval
							
SMFS0603P150	K	1.50	32V DC	50A / 32V DC	0.104	0.1125	✓
SMFS0603P200	N	2.00			0.054	0.1752	✓
SMFS0603P250	O	2.50			0.036	0.4001	✓
SMFS0603P300	P	3.00			0.027	0.7329	✓
SMFS0603P350	R	3.50			0.022	0.9758	✓
SMFS0603P400	S	4.00	32V DC	35A / 32V DC	0.016	2.1722	✓
SMFS0603P500	T	5.00			0.0105	3.3128	✓
SMFS0603P600	6	6.00			0.0075	8.4692	✓

† Measured at ≤10% rated current and 25°C

‡ Melting I<sup>2</sup>T at 10 times of rated current

## SMFS0603 Series Surface Mount Fuses Devices

### Electrical Specification

Ampere Rating	% of Current Rating	Opening Time
1.5A~6A	100%	4 Hours Min.
	200%	60 Seconds Max.
1.5A~3A	1000%	0.3 msec. Min.
3.5A~6A	1000%	0.6 msec. Min.

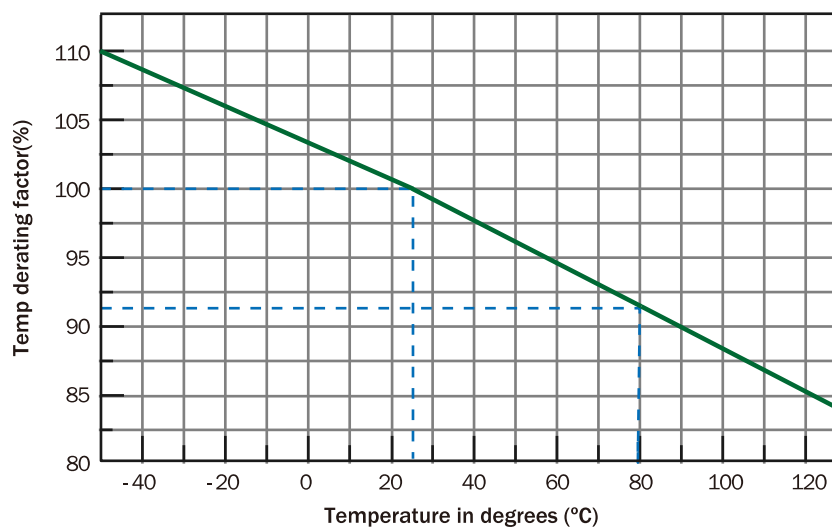
### Physical Specifications

Materials	Substrate: Ceramic Terminations: Silver over-plated with 100% tin Element: Silver or Silver/palladium
Solderability	MIL-STD-202
Soldering Parameters	Wave Solder: 260°C, 10 seconds max. Reflow Solder: 260°C, 5 seconds max. Hand Solder: 350°C, 5 seconds max.

### Environmental Specifications

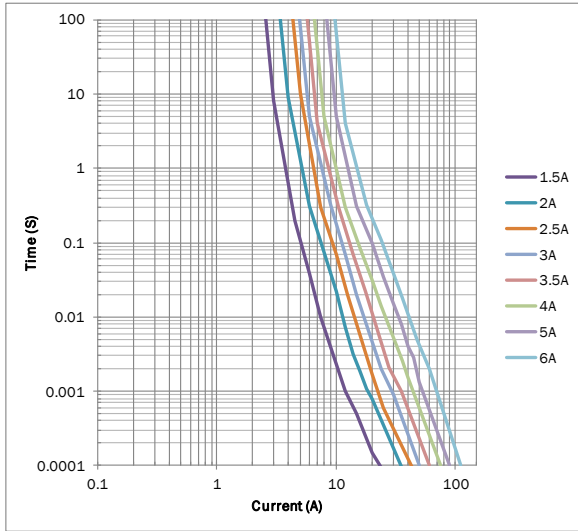
Operating Temperature	-50°C to 125 °C
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### Thermal Derating Curve

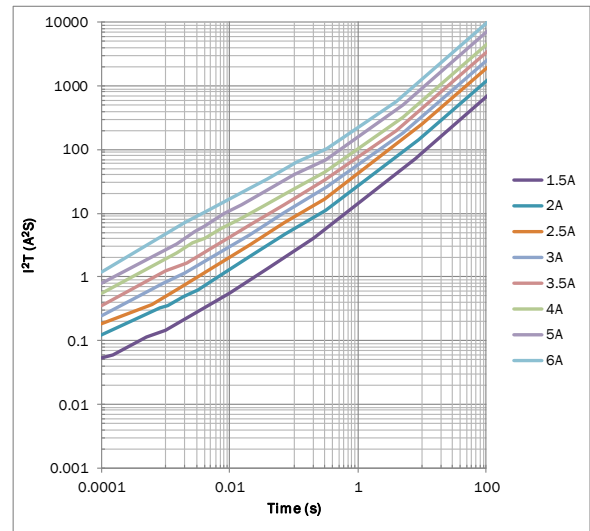


## SMFS0603 Series Surface Mount Fuses Devices

### Time-Current Curve



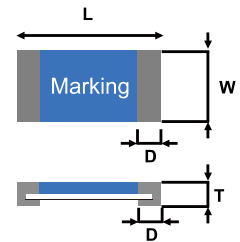
### I<sup>2</sup>T vs Time Curve



### Physical Dimensions (mm.)

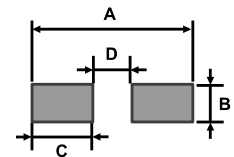
#### Dimensions (mm)

L	W	T	D
1.60±0.15	0.80±0.15	0.40±0.10	0.30±0.20



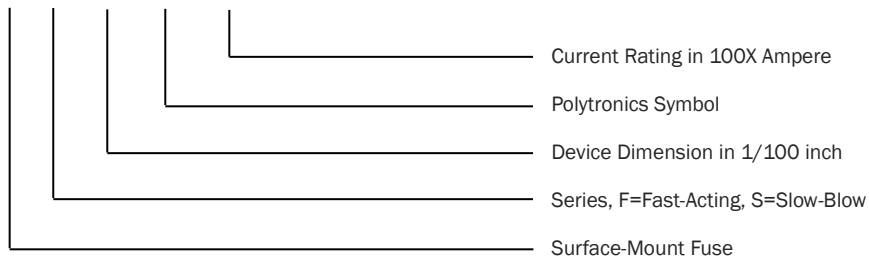
#### Recommended Solder Pad Dimension (mm)

A	B	C	D
3.0±0.5	1.4±0.2	1.0±0.3	1.0±0.2



### Part Number

#### SMF S 0603 P □□□



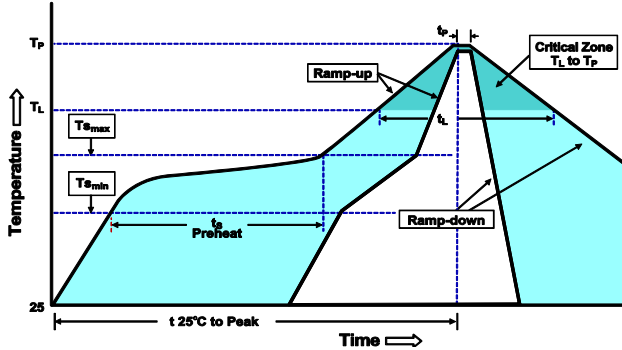
## SMFS0603 Series Surface Mount Fuses Devices

### Reliability Test

Characteristics	Test condition / Methods	Requirement	Test Reference
Voltage Drop	100% In; Temperature in fuse was stabilized	Deviation between the mean value: <15%	IEC 60127-1
Time/Current	100% In	No Fusing, 4 hours min.	Refer to Spec
	200% In	≤ 60 seconds	
	1000% In (1.5A~3A) 1000% In (3.5A~6A)	> 0.3 ms. > 0.6 ms	
Endurance Test	100% In, 1hour on, 15min off, 100cycles; followed by 1hour at 125% In	ΔR  <10% Legible appearance	IEC60127-1
Maximum Sustained Dissipation	125% In, during the last 10min of the endurance test	Changed with current rating	IEC60127-1
Temperature Rise	100% In	ΔT  <75 °C	UL248-14
Interrupting Ability	50A/32V DC (1.5A~3.5A) 35A/32V DC (4A~6A)	Without permanent arcing, ignition, and bursting of fuse link	UL 248-14
Solderability	240 °C ± 5 °C, 3sec ± 0.5sec	95% coverage min	IEC 60127-4 IEC 60068-2-20 MIL-STD-202
Resistance to Soldering	260 °C ± 5 °C, 10sec ± 0.5sec	ΔR  : <10% Legible appearance	MIL-STD-202 IEC60127-4
Bending Test	Distance between holding points: 90mm Bending: 1 mm; Time: 10 seconds	ΔR  : <10% No mechanical damages	IEC 60127-4
High Temperature Operating Life	70 °C ± 2 °C at 60% In for 96 hours	ΔR  : <10%; no fusing	MIL-STD-202 Method 108
Low Temperature Storage	-55 °C ± 2 °C for 96 hours	ΔR  : <10%	IEC60068-2-1
High Temperature Storage	125 °C ± 2 °C for 96 hours	ΔR  : <10%	IEC60068-2-2
Humidity (Steady State)	40 °C ± 2 °C, 90~95%RH for 1000 hours	ΔR  : <10%	MIL-STD-202 Method 103
Salt Spray	5% salt solution, 48 hours exposure	ΔR  : <10% Legible appearance	MIL-STD-202 Method 101
Thermal Shock	5 cycles between -55 °C /+125 °C 60 minutes at each extreme zone	ΔR  : <10% No mechanical damage	IEC 60068-2-14

## SMFS0603 Series Surface Mount Fuses Devices

### Soldering Parameters

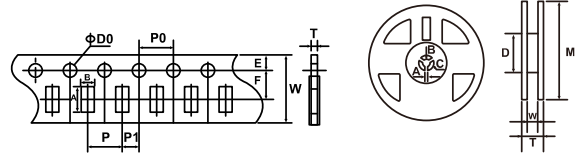


Average Ramp-Up Rate (T <sub>Smax</sub> to T <sub>P</sub> )	3°C/second max.
Preheat	
-Temperature Min (T <sub>Smin</sub> )	150°C
-Temperature Max (T <sub>Smax</sub> )	200°C
-Time (T <sub>Smin</sub> to T <sub>Smax</sub> )	60-120 seconds
Time maintained above:	
-Temperature (T <sub>L</sub> )	217°C
-Time (t <sub>L</sub> )	20-30 seconds
Peak Temperature (T <sub>P</sub> )	260°C
Time within 5°C of actual Peak Temperature (t <sub>P</sub> )	5 seconds
Ramp-Down Rate	6°C /second max.
Time 25°C to Peak Temperature	8 minutes max.

Note 1: All temperature refer to topside of the package, measured on the package body surface.

Note 2: If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.

### Tape & Reel Specification (mm.)



A	1.85 ± 0.10
B	1.10 ± 0.10
W	8.00 ± 0.20
F	3.50 ± 0.05
E	1.75 ± 0.10
P	4.00 ± 0.10
P0	4.00 ± 0.10
P1	2.00 ± 0.05
D0	∅ 1.50 ± 0.10
T	0.60 ± 0.10

M	∅ 178.0 ± 2.0
W	9.5 ± 1.0
T	12.5 ± 1.5
A	2.0 ± 0.5
B	∅ 13.0 ± 0.5
C	∅ 21.0 ± 0.5
D	∅ 58.0 ± 2.0

### Packaging Quantity

Part Number	Tape & Reel Quantity
SMFS0603PXXX	5000