

**PRODUCT  
DATASHEET**



**SMFF0603 Series Surface Mount Fuses Devices**

## SMFF0603 Series Surface Mount Fuses Devices

### Description

Polytronics SMFF0603 series surface mount fast-acting 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. SMFF0603 series is also RoHS compliant and halogen-free to meet global environmental standard






### Features

- Fast acting
- Compact size
- Thick film manufacturing method
- Ceramic substrate with silver fusing element
- Excellent environmental integrity


### Application

- Battery packs
- Digital camera
- Game equipment
- Wireless base station
- LCD monitors and modules
- PC related equipment / peripherals
- Portable device (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
							
SMFF0603P150	K	1.50	32V DC	50A / 32V DC	0.108	0.0365	✓
SMFF0603P200	N	2.00			0.058	0.0595	✓
SMFF0603P250	O	2.50			0.043	0.1222	✓
SMFF0603P300	P	3.00			0.044	0.1350	✓
SMFF0603P350	R	3.50			0.032	0.1891	✓
SMFF0603P400	S	4.00	32V DC	35A / 32V DC	0.019	0.3559	✓
SMFF0603P500	T	5.00			0.0135	0.7030	✓
SMFF0603P600	6	6.00			0.0115	0.8861	✓

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

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

## SMFF0603 Series Surface Mount Fuses Devices

### Electrical Specification

Ampere Rating	% of Current Rating	Opening Time
1.5A~6A	100%	4 Hours Min.
	250%	5 Seconds Max.

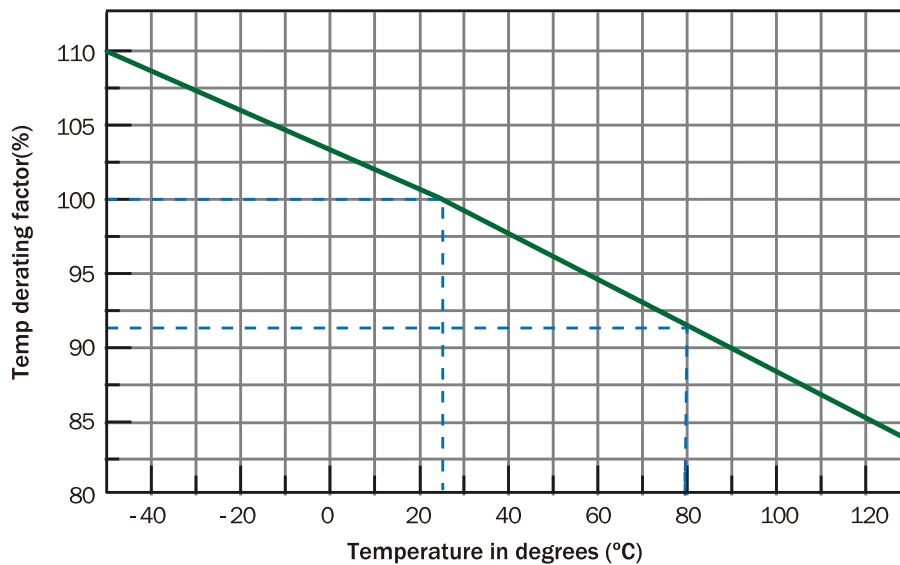
### Physical Specifications

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

### Environmental Specifications

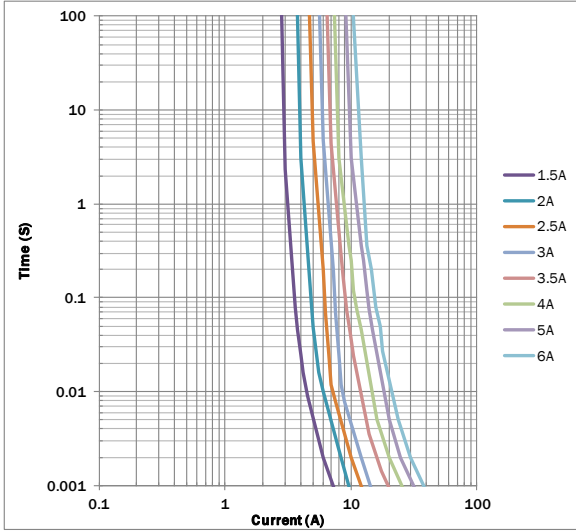
<b>Operating Temperature</b>	-50°C to 125 °C
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### Thermal Derating Curve

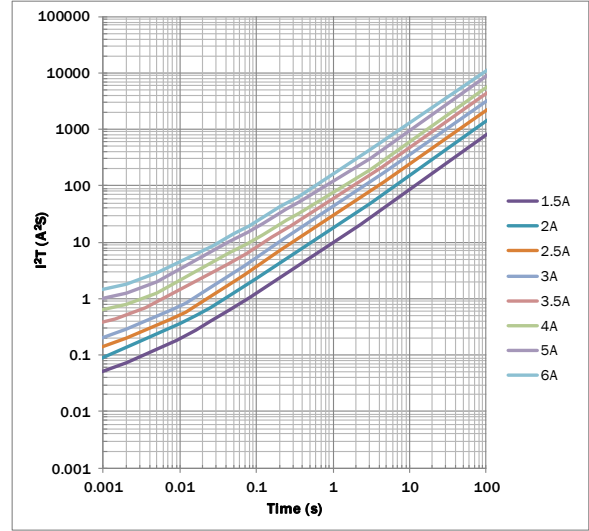


## SMFF0603 Series Surface Mount Fuses Devices

Time-Current Curve



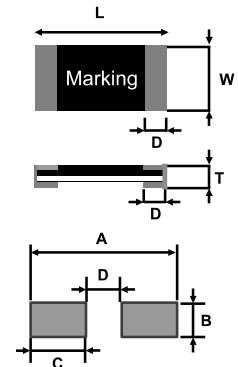
I<sup>2</sup>T vs Time Curve



### 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

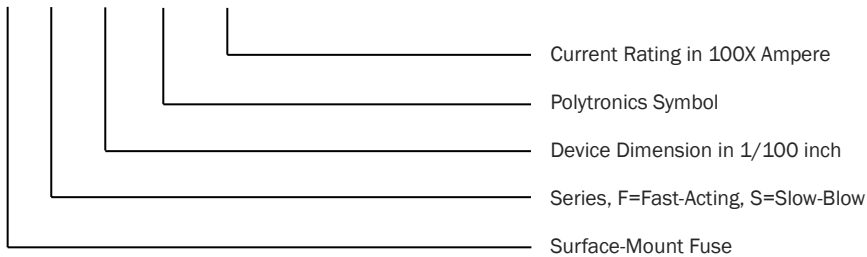


Recommended Solder Pad Dimension (mm)

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

### Part Number

SMF F 0603 P □□□



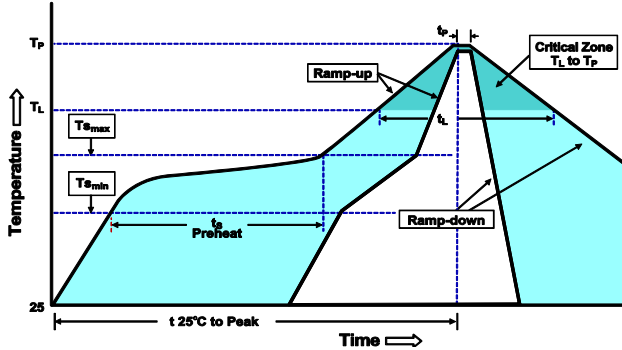
## SMFF0603 Series Surface Mount Fuses Devices

### 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
	250% In	Within 5 seconds	
Endurance Test	100% In, 1hour on, 15min off, 100cycles; followed by 1hour at 125% In	$\Delta R$   <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	$\Delta T$   <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	$\Delta R$   : <10% Legible appearance	MIL-STD-202 IEC60127-4
Bending Test	Distance between holding points: 90mm Bending: 1 mm; Time: 10 seconds	$\Delta R$   : <10% No mechanical damages	IEC 60127-4
High Temperature Operating Life	70°C ± 2°C at 60% In for 96 hours	$\Delta R$   : <10%; no fusing	MIL-STD-202 Method 108
Low Temperature Storage	-55°C ± 2°C for 96 hours	$\Delta R$   : <10%	IEC60068-2-1
High Temperature Storage	125°C ± 2°C for 96 hours	$\Delta R$   : <10%	IEC60068-2-2
Humidity (Steady State)	40°C ± 2°C, 90~95%RH for 1000 hours	$\Delta R$   : <10%	MIL-STD-202 Method 103
Salt Spray	5% salt solution, 48 hours exposure	$\Delta R$   : <10% Legible appearance	MIL-STD-202 Method 101
Thermal Shock	5 cycles between -55°C /+125°C 60 minutes at each extreme zone	$\Delta R$   : <10% No mechanical damage	IEC 60068-2-14

## SMFF0603 Series Surface Mount Fuses Devices

### Soldering Parameters

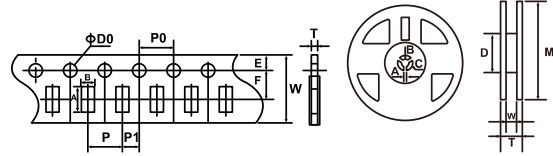


Average Ramp-Up Rate ( $T_{lmax}$ to $T_p$ )	3°C/second max.
Preheat	
-Temperature Min ( $T_{lmin}$ )	150°C
-Temperature Max ( $T_{lmax}$ )	200°C
-Time ( $T_{lmin}$ to $T_{lmax}$ )	60-120 seconds
Time maintained above:	
-Temperature ( $T_l$ )	217°C
-Time ( $t_l$ )	20-30 seconds
Peak Temperature ( $T_p$ )	260°C
Time within 5°C of actual Peak Temperature ( $t_p$ )	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
SMFF0603PXXX	5000