

PRODUCT  
DATASHEET



**SMFF1206P2000~3000 Surface Mount Fuses Devices**

## SMFF1206P2000~3000 Surface Mount Fuses Devices

### Description

Polytronics SMFF1206 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. SMFF1206 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 pack
- PC related equipment / peripherals
- Digital camera
- Power supply
- Game equipment
- Wireless base station
- LCD monitor, LCD modules
- Medical device

### 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	Typical Cold DCR† (Ω)	Typical I <sup>2</sup> T‡ (A <sup>2</sup> S)	Agency Approval
							
SMFF1206P2000	20	20.0	48V DC	300A / 32V DC 200A / 48V DC	0.0017	48	✓
SMFF1206P2500	25	25.0			0.0013	70	✓
SMFF1206P3000	30	30.0			0.0010	90	✓

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

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

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### Electrical Specification

Ampere Rating	% of Current Rating	Opening Time
20.0A~30.0A	100%	4 Hours Min.
	350%	5 Seconds Max.

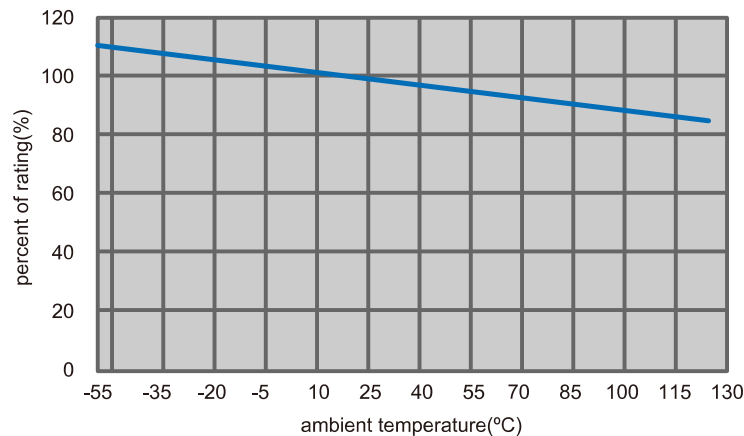
### Physical Specifications

<b>Materials</b>	Substrate: Ceramic Terminations: Silver over-plated with tin (100%) 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

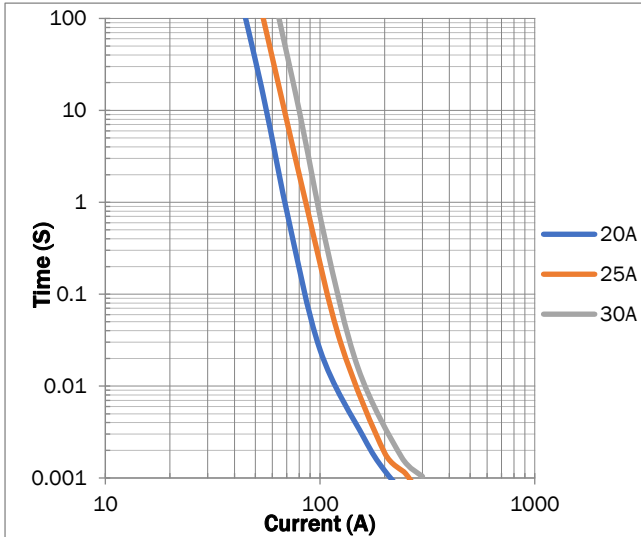
<b>Operating Temperature</b>	-55°C to 125°C
<b>Moisture Sensitivity Level</b>	Level 1, J-STD-020C

### Thermal Derating Curve

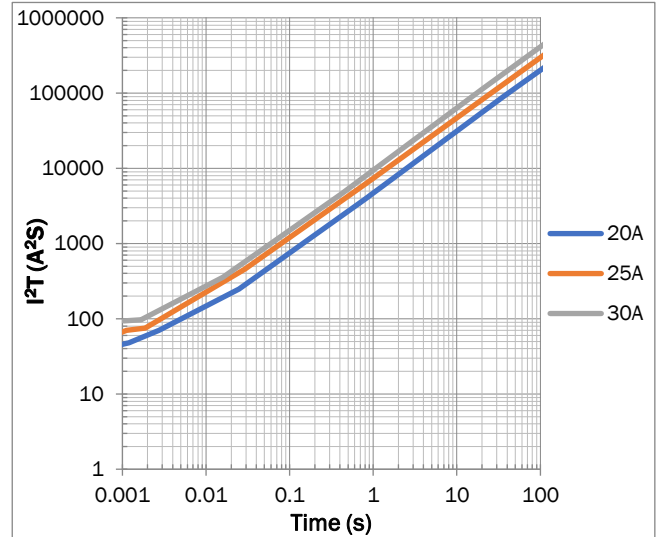


## SMFF1206P2000~3000 Surface Mount Fuses Devices

**Time-Current Curve**



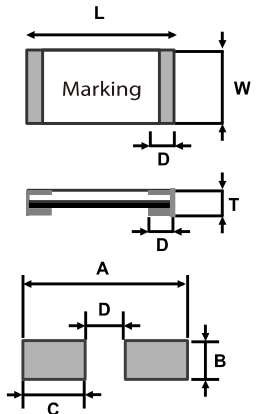
**I<sup>2</sup>T vs Time Curve**



### Physical Dimensions (mm.)

Dimensions (mm)

L	W	T	D
3.10±0.20	1.55±0.20	0.80±0.20	0.65±0.20



Recommended Solder Pad Dimension (mm)

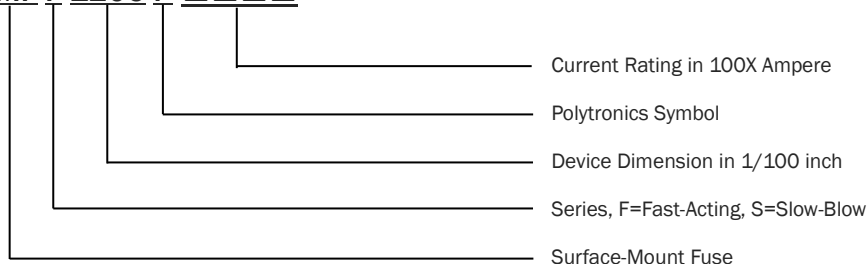
A	B	C	D
4.4±0.5	2.4±0.3	1.2±0.3	2.0±0.3

Dimensions of Standard Test Board (mm)

Ampere Rating	Board Thickness	Copper Layer Thickness	Copper Trace Width
20A~30A	1.6	0.175	10.0

### Part Number

SMF F 1206 P □□□□



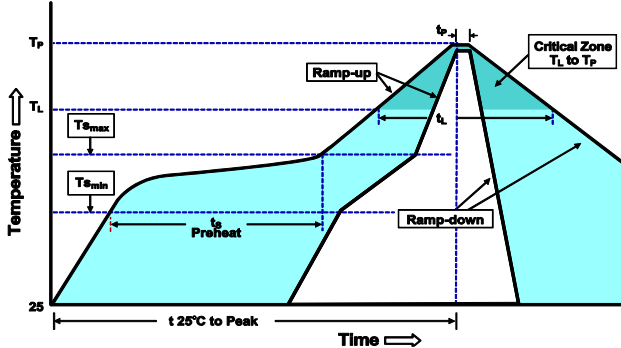
## SMFF1206P2000~3000 Surface Mount Fuses Devices

### Reliability Test

Characteristics	Test condition / Methods	Requirement	Test Reference
Voltage Drop	100% In	Deviation between the mean value: <15%	IEC 60127-4
Time/Current	100% In	No fusing, 4 hours min.	UL 248-14
	350% In	≤5sec	Refer to Spec.
Temperature Rise	100% In	ΔT <95°C	IEC60127-4
Interrupting Ability	300A/32V DC 200A/48V DC	Without permanent arcing, ignition and bursting of fuse link	UL 248-14 IEC6017-4
Solderability	240°C ± 5°C, 3sec ± 0.5sec	95% coverage min	IEC 60127-4 IEC 60068-2-20 MIL-STD-208
Resistance to Soldering	260°C ± 5°C, 10sec ± 0.5sec	ΔR : <10% Legible appearance	MIL-STD-202 Method 210
Bending Test	Distance between holding points: 90mm Bending: 1 mm; Time: 10 sec	ΔR : <10% No mechanical damages	IEC 60127-4
High Temperature Operating Life	70°C ± 2°C, 60% In, 96 hours	ΔR : <10%; no fusing	MIL-STD-202 Method 108
Low Temperature Storage	-55°C ± 3°C, 96 hours	ΔR : <10%	IEC 60068-2-1
High temperature Storage	125°C ± 2°C, 96 hours	ΔR : <10%	IEC 60068-2-2
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	ΔR : <10% Legible appearance	MIL-STD-202 Method 101
Thermal Shock	100 cycles between -65°C / +125°C 60 minutes at each extreme zone	ΔR : <10% No mechanical damage	MIL-STD-202 Method 107

## SMFF1206P2000~3000 Surface Mount Fuses Devices

### Soldering Parameters

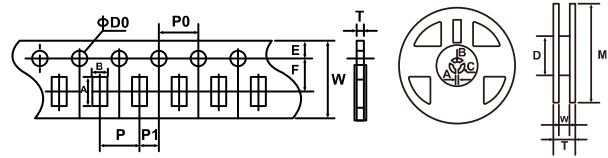


Average Ramp-Up Rate (T <sub>Smax</sub> to T <sub>P</sub> )	3°C/second max.
Preheat	
-Temperature Min (T <sub>Smin</sub> )	150°C
-Temperature Max (T <sub>Smax</sub> )	200°C
-Time (T <sub>Smin</sub> to T <sub>Smax</sub> )	60-120 seconds
Time maintained above:	
-Temperature (T <sub>L</sub> )	217°C
-Time (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 top side 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	3.50 ± 0.20
B	1.90 ± 0.20
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 ± 0.10
DO	∅ 1.50 ± 0.10
T	1.05 ± 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
SMFF1206PXXXX	4000

### Storage

- The ambient temperature recommended for storage shall be between 5°C ~30°C.
- The relative humidity recommended for storage shall be between 25%RH~60%RH.
- The products shall not be stored in areas where harmful gases containing sulfur or chlorine are present.

### Warning

- Fuse product is not suitable for any type of coating. Polytronics is not responsible for any damage directly or indirectly related to the coating.
- For copper layer thickness or copper trace width different from the standard test board, fusing characteristics needs to be verified to ensure product performance meet user requirement.