

**PRODUCT
DATASHEET**



SMFF1206P800~1500 Surface Mount Fuses Devices

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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 cameras
- Game equipment
- LCD monitors and modules
- Wireless base station
- Power supply
- 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 ² T‡ (A ² S) | Agency Approval |
|---------------|---------|--------------------|----------------|---------------------|-----------------------|--|---|
| | | | | | | |  |
| SMFF1206P800 | 8 | 8.0 | 32V DC | 150A / 32V DC | 0.0067 | 16.2 | ✓ |
| SMFF1206P1000 | 10 | 10.0 | | | 0.0052 | 20.0 | ✓ |
| SMFF1206P1200 | 12 | 12.0 | | | 0.0036 | 28.8 | ✓ |
| SMFF1206P1500 | 15 | 15.0 | | | 0.0023 | 80.0 | ✓ |

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

‡ Melting I²T at 10 times of rated current

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Electrical Specification

| Ampere Rating | % of Current Rating | Opening Time |
|---------------|---------------------|----------------|
| 8.0A~15.0A | 100% | 4 Hours Min. |
| | 350% | 5 Seconds Max. |

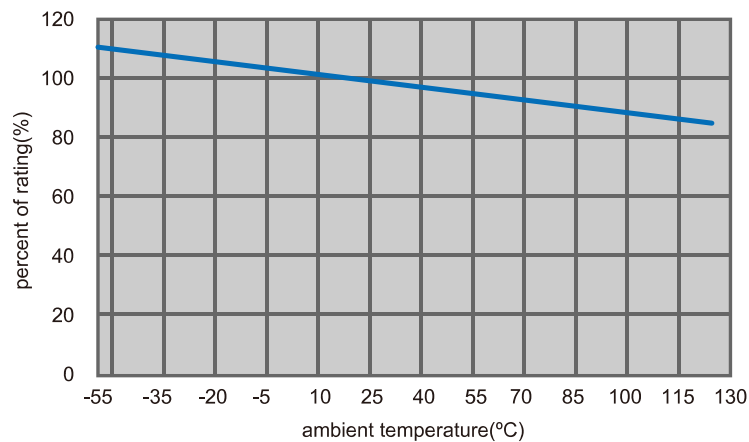
Physical Specifications

| | |
|----------------------|---|
| 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

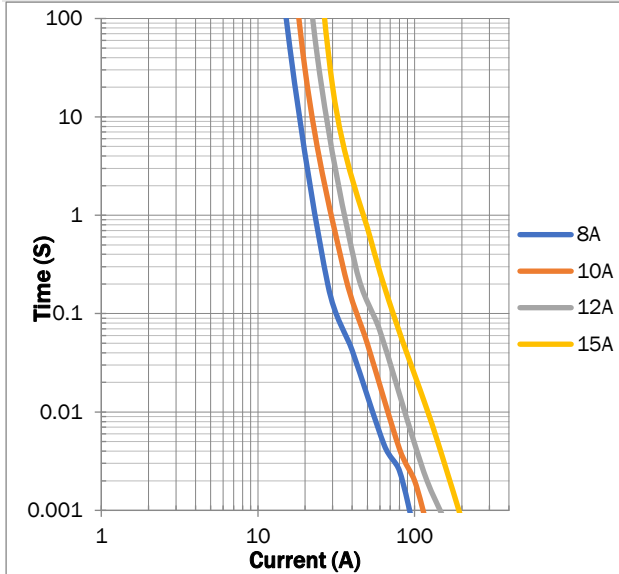
| | |
|-----------------------|-----------------|
| Operating Temperature | -55°C to 125 °C |
|-----------------------|-----------------|

Thermal Derating Curve

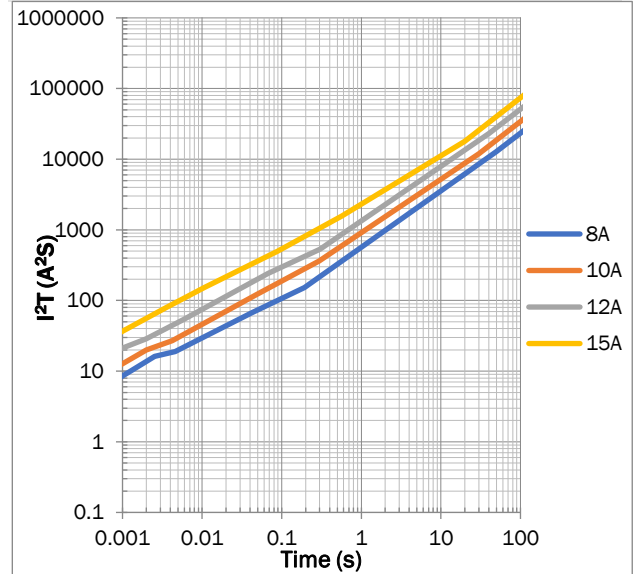


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Time-Current Curve



I²T vs Time Curve



Physical Dimensions (mm.)

Dimensions (mm)

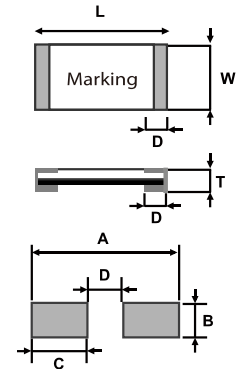
| L | W | T | D |
|-----------|-----------|-----------|-----------|
| 3.10±0.20 | 1.55±0.20 | 0.55±0.20 | 0.50±0.20 |

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 |

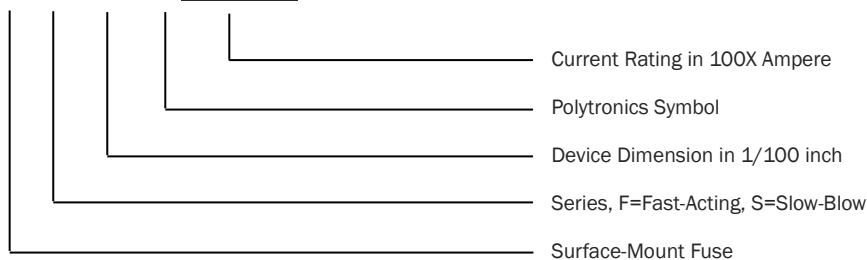
Dimensions of Standard Test Board (mm)

| Ampere Rating | Board Thickness | Copper Layer Thickness | Copper Trace Width |
|---------------|-----------------|------------------------|--------------------|
| 8A~10A | 1.6 | 0.070 | 7.5 |
| 12~15A | 1.6 | 0.080 | 10.0 |



Part Number

SMF F 1206 P □□□□



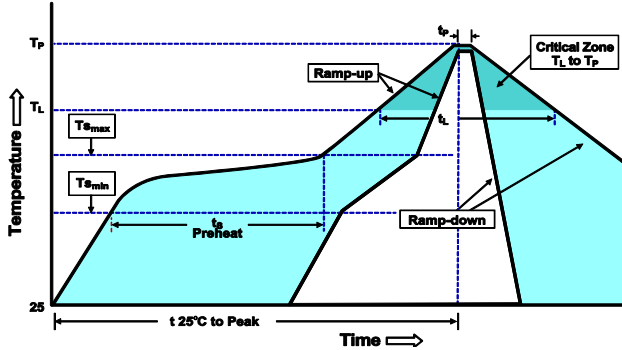
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Reliability Test

| 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. | UL248-14 |
| | 350% In | Within 5 seconds | Refer to Spec. |
| Temperature Rise | 100% In | $ \Delta T < 95^{\circ}\text{C}$ | IEC60127-4 |
| Interrupting Ability | 150A/32V DC | Without permanent arcing, ignition and bursting of fuse link | UL 248-14 IEC60127-4 |
| Solderability | 240°C ± 5°C, 3sec ± 0.5sec | 95% coverage min | IEC 60127-4 IEC 60068-2-20 Method 208 |
| Resistance to Soldering | 260°C ± 5°C, 10sec ± 0.5 sec | $ \Delta R < 10\%$ Legible appearance | MIL-STD-202 Method 210 |
| Bending Test | Distance between holding points: 90mm Bending: 1 mm; Time, 10 sec | $ \Delta R < 10\%$ No mechanical damages | IEC 60127-4 |
| High Temperature Operating Life | 70°C ± 2°C at 60% In, 96 hours | $ \Delta R < 10\%$; no fusing | MIL-STD-202 Method 108 |
| Low Temperature Storage | -55°C ± 3 °C, 96 hours | $ \Delta R < 10\%$ | IEC 60068-2-1 |
| High temperature Storage | 125°C ± 2°C, 96 hours | $ \Delta R < 10\%$ | IEC 60068-2-2 |
| 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 | $ \Delta R < 10\%$ Legible appearance | MIL-STD-202 Method 101 |
| Thermal Shock | 100 cycles between -65°C /+125°C 60 minutes at each extreme zone | $ \Delta R < 10\%$ No mechanical damage | MIL-STD-202 Method 107 |

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Soldering Parameters

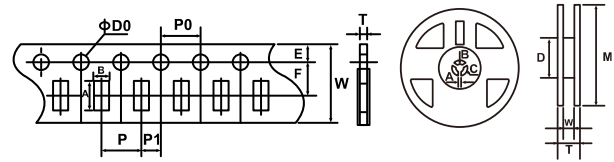


| | |
|--|------------------|
| Average Ramp-Up Rate ($T_{S_{max}}$ to T_P) | 3°C/second max. |
| Preheat | |
| -Temperature Min ($T_{S_{min}}$) | 150°C |
| -Temperature Max ($T_{S_{max}}$) | 200°C |
| -Time ($T_{S_{min}}$ to $T_{S_{max}}$) | 60-120 seconds |
| Time maintained above: | |
| -Temperature (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 | 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 | 0.75 ± 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 | 5000 |

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.