POLYTRONICS
POLYTRONICS TECHNOLOGY CORP.

PRODUCT
DATASHEET


# SMFD1206 Series Surface Mount Fuses Devices

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## Description

Polytronics SMFD1206 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. SMFD1206 series is also RoHS compliant and halogen-free to meet global environmental standard.


## Features

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

## Application

- Battery packs
- LED driver
- Car charger
- Game equipments
- LCD monitors and modules
- Wireless base station
- Portable device (battery charger, etc.)

## Agency Approval and Environmental Compliance

| Agency | File Number |
|---|---|
| c UL us | UL/CSA:E331807 |

| Regulation | Standard |
|---|---|
| RoHS | 2011/65/EU |
| Halogen Free | IEC 61249-2-21:2003 |

## Electrical Characteristics

| Part Number | Marking | Current Rating (A) | Voltage Rating | Interrupting Rating | Max Cold DCR† (Ω) | Typical I²T‡ (A²S) | Agency Approval c UL us |
|---|---|---|---|---|---|---|---|
| SMFD1206P100 | H | 1.00 | 63V | 50A 63V DC 63V AC | 0.380 | 0.245 | ✓ |
| SMFD1206P150 | K | 1.50 | | | 0.200 | 0.294 | ✓ |
| SMFD1206P200 | N | 2.00 | | | 0.105 | 0.788 | ✓ |
| SMFD1206P250 | O | 2.50 | | | 0.078 | 1.149 | ✓ |
| SMFD1206P300 | P | 3.00 | | | 0.045 | 2.300 | ✓ |
| SMFD1206P350 | R | 3.50 | | | 0.037 | 2.563 | ✓ |
| SMFD1206P400 | S | 4.00 | | | 0.028 | 3.667 | ✓ |
| SMFD1206P500 | T | 5.00 | | | 0.020 | 4.260 | ✓ |
| SMFD1206P600 | 6 | 6.00 | | | 0.016 | 9.848 | ✓ |
| SMFD1206P700 | U | 7.00 | | | 0.009 | 11.176 | ✓ |

† Measured at≤10% rated current and 25℃

‡ Melting I²T at 10 times of rated current

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## Electrical Specification

| Ampere Rating | % of Current Rating | Opening Time |
|---|---|---|
| 1A~7A | 100% | 4 Hours Min. |
| | 200% | 60 Seconds Max. |
| | 1000% | 1.0mSec. Min. |

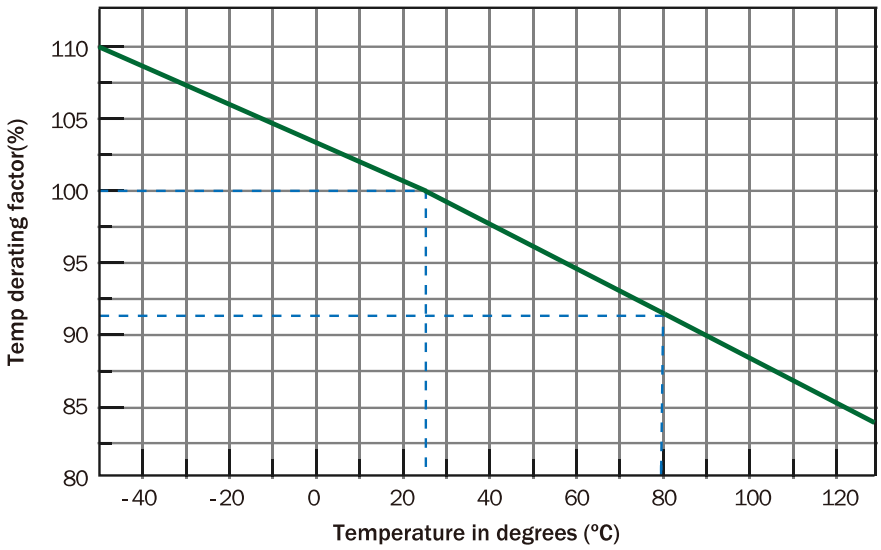
## Physical Specifications

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

## Environmental Specifications

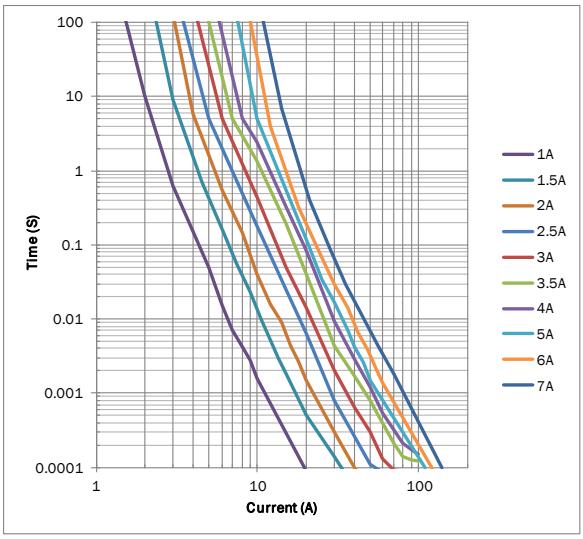
| | |
|---|---|
| **Operating Temperature** | -50°C to 125 °C |

## Thermal Derating Curve

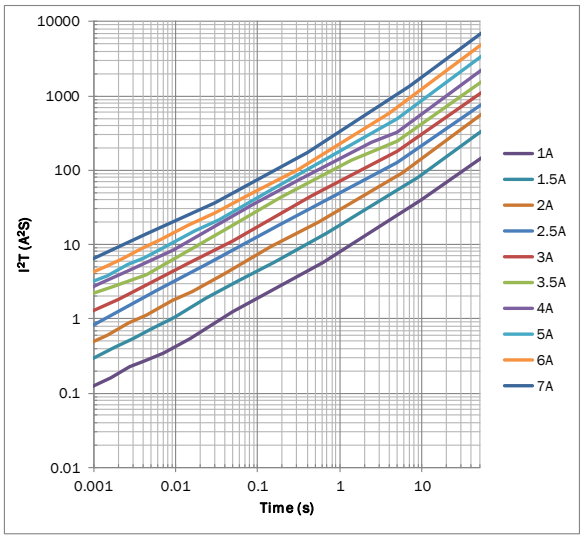


# SMFD1206 Series Surface Mount Fuses Devices

## Time-Current Curve




## I²T vs Time Curve



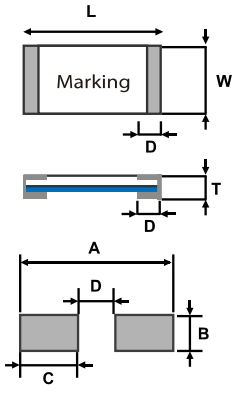

## Physical Dimensions (mm.)

### Dimensions (mm)

| L | W | T | D |
|---|---|---|---|
| 3.10±0.2 | 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 |




## Part Number

SMF D 1206 P □□□

- Current Rating in 100X Ampere
- Polytronics Symbol
- Device Dimension in 1/100 inch
- Series, F=Fast-Acting, S=Slow-Blow
  D=Slow-blow 63V
- Surface-Mount Fuse

# SMFD1206 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/Curve** | 100% In | No fusing, 4 hours min. | Refer to Spec. |
| | 200% In | Within 60 seconds | |
| | 1000% In | > 1.0 ms | |
| **Endurance Test** | 100% In, 1hour on, 15min off, 100cycles; followed by 1hour at 125% In | \|ΔR\|<10%<br>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 | I ΔT I <75°C | UL248-14 |
| **Interrupting Ability** | 50A/63V DC<br>50A/63V AC | 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<br>IEC 60068-2-20<br>MIL-STD-202 |
| **Resistance to Soldering** | 260°C ± 5°C, 10sec ± 0.5sec | \|ΔR\|: <10%<br>Legible appearance | MIL-STD-202<br>IEC60127-4 |
| **Bending Test** | Distance between holding points: 90mm<br>Bending: 1 mm; Time: 10 seconds | \|ΔR\|: <10%<br>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<br>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<br>Method 103 |
| **Salt Spray** | 5% salt solution, 48 hours exposure | \|ΔR\|: <10%<br>Legible appearance | MIL-STD-202<br>Method 101 |
| **Thermal Shock** | 5 cycles between -55°C /+125°C<br>60 minutes at each extreme zone | \|ΔR\|: <10%<br>No mechanical damage | IEC 60068-2-14 |

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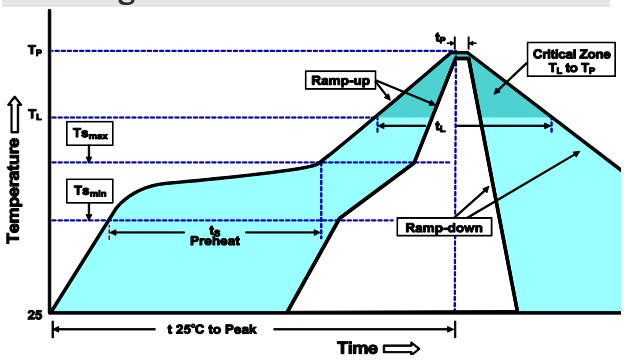
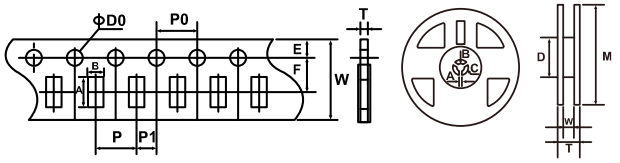
## Soldering Parameters




| | |
|---|---|
| Average Ramp-Up Rate ($Ts_{max}$ to $T_P$) | 3°C/second max. |
| Preheat | |
| -Temperature Min ($Ts_{min}$) | 150°C |
| -Temperature Max ($Ts_{max}$) | 200°C |
| -Time ($Ts_{min}$ to $Ts_{max}$) | 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 ± 0.05 |
| D0 | Ø 1.50 ± 0.10 |
| T | 0.75 ± 0.10 |

| | |
|---|---|
| M | Ø 178.0 ± 2.0 |
| W | 9.50 ± 1.0 |
| T | 12.5 ± 1.5 |
| A | 2.0 ± 0.5 |
| B | Ø 13.0 ± 0.5 |
| C | Ø 21.0 ± 0.5 |
| D | Ø 58.0 ± 2.0 |

## Packaging Quantity

| Part Number | Tape & Reel Quantity |
|---|---|
| SMFD1206PXXX | 5000 |