POLYTRONICS
POLYTRONICS TECHNOLOGY CORP.

# SMD1812 HF Series Surface Mount PTC Devices

# SMD1812 HF Series Surface Mount PTC Devices

## Description

The 1812 series provides surface mount resettable overcurrent protection with holding current from 0.1A to 3.0A. This series offers complete portfolio in terms of holding current and working voltage, and is suitable for wide range of applications.

## Features

- RoHS compliant and lead-free
- Halogen-free
- Compact design saves board space
- Low profile
- Fast response to fault current
- Compatible with high temperature solders

## Applications

- USB hubs, ports and peripherals
- Set-top-box and HDMI
- Game console port protection
- Motherboard USB & IEEE 1394 protection
- Optical disk drives
- General electronics

## Agency Approval and Environmental Compliance

| Agency | File Number |
|---|---|
| c UL us | E201431 |
| TÜVRheinland | R50099121 |

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

## Electrical Characteristics

| Part Number | $I_{hold}$ (A) | $I_{trip}$ (A) | $V_{max}$ (Vdc) | $I_{max}$ (A) | $P_{d\ typ}$ (W) | Maximum Time To Trip | | Resistance | | Agency Approval | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Current (A) | Time (Sec.) | $R_{min}$ (Ω) | $R_{1max}$ (Ω) | c UL us | TÜVRheinland |
| SMD1812P010TF | 0.10 | 0.30 | 30 | 100 | 0.8 | 0.50 | 1.50 | 1.600 | 15.000 | ✓ | ✓ |
| SMD1812P010TF/60 | 0.10 | 0.30 | 60 | 10 | 0.8 | 0.50 | 1.50 | 1.600 | 15.000 | ✓ | ✓ |
| SMD1812P014TF | 0.14 | 0.34 | 60 | 10 | 0.8 | 1.50 | 0.15 | 1.500 | 6.000 | ✓ | ✓ |
| SMD1812P020TF | 0.20 | 0.40 | 30 | 100 | 0.8 | 8.00 | 0.02 | 0.800 | 5.000 | ✓ | ✓ |
| SMD1812P020TF-J | 0.20 | 0.40 | 60 | 40 | 0.8 | 1.00 | 2.00 | 1.400 | 4.400 | ✓ | ✓ |
| SMD1812P035TF/30 | 0.35 | 0.75 | 30 | 40 | 0.8 | 8.00 | 0.15 | 0.400 | 1.700 | ✓ | ✓ |
| SMD1812P035TF/60 | 0.35 | 0.70 | 60 | 10 | 1.0 | 8.00 | 0.15 | 0.400 | 1.700 | ✓ | ✓ |
| SMD1812P050TF | 0.50 | 1.00 | 15 | 100 | 0.8 | 8.00 | 0.15 | 0.150 | 1.000 | ✓ | ✓ |
| SMD1812P050TF/30 | 0.50 | 1.00 | 30 | 100 | 0.8 | 8.00 | 0.15 | 0.150 | 1.000 | ✓ | ✓ |
| SMD1812P050TF/60 | 0.50 | 1.00 | 60 | 10 | 1.5 | 8.00 | 0.15 | 0.150 | 1.000 | ✓ | ✓ |
| SMD1812P075TF | 0.75 | 1.50 | 13.2 | 100 | 0.8 | 8.00 | 0.20 | 0.100 | 0.450 | ✓ | ✓ |
| SMD1812P075TF/24 | 0.75 | 1.50 | 24 | 100 | 0.8 | 8.00 | 0.20 | 0.110 | 0.290 | ✓ | ✓ |
| SMD1812P075TF/33 | 0.75 | 1.50 | 33 | 20 | 0.8 | 8.00 | 0.20 | 0.110 | 0.400 | ✓ | ✓ |
| SMD1812P110TF | 1.10 | 2.20 | 8 | 100 | 0.8 | 8.00 | 0.30 | 0.040 | 0.210 | ✓ | ✓ |
| SMD1812P110TF/16 | 1.10 | 1.95 | 16 | 100 | 0.8 | 8.00 | 0.30 | 0.060 | 0.180 | ✓ | ✓ |
| SMD1812P110TF/24 | 1.10 | 1.95 | 24 | 20 | 0.8 | 8.00 | 0.50 | 0.060 | 0.200 | ✓ | ✓ |
| SMD1812P110TF/33 | 1.10 | 1.95 | 33 | 20 | 0.8 | 8.00 | 0.50 | 0.060 | 0.200 | ✓ | ✓ |
| SMD1812P125TF/16 | 1.25 | 2.50 | 16 | 100 | 0.8 | 8.00 | 0.40 | 0.050 | 0.140 | ✓ | ✓ |
| SMD1812P150TF/8 | 1.50 | 3.00 | 8 | 100 | 0.8 | 8.00 | 0.30 | 0.040 | 0.110 | ✓ | ✓ |

# SMD1812 HF Series Surface Mount PTC Devices

## Electrical Characteristics

Cont'd

| Part Number | $I_{hold}$ (A) | $I_{trip}$ (A) | $V_{max}$ (Vdc) | $I_{max}$ (A) | $P_{d\ typ}$ (W) | Maximum Time To Trip | | Resistance | | Agency Approval | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Current (A) | Time (Sec.) | $R_{min}$ (Ω) | $R_{1max}$ (Ω) | c UL us | TÜVRheinland |
| SMD1812P150TF/12 | 1.50 | 3.00 | 12 | 100 | 0.8 | 8.00 | 0.50 | 0.040 | 0.110 | ✓ | ✓ |
| SMD1812P150TF/16 | 1.50 | 2.80 | 16 | 100 | 0.8 | 8.00 | 0.50 | 0.040 | 0.110 | ✓ | ✓ |
| SMD1812P150TF/24 | 1.50 | 3.00 | 24 | 20 | 0.8 | 8.00 | 1.50 | 0.040 | 0.120 | ✓ | ✓ |
| SMD1812P160TF/8(4L) | 1.60 | 2.80 | 8 | 100 | 0.8 | 8.00 | 1.00 | 0.030 | 0.100 | ✓ | ✓ |
| SMD1812P200TFT | 2.00 | 3.50 | 8 | 100 | 0.8 | 8.00 | 2.00 | 0.020 | 0.070 | ✓ | ✓ |
| SMD1812P200TF/12 | 2.00 | 3.50 | 12 | 100 | 1.0 | 8.00 | 2.00 | 0.020 | 0.070 | ✓ | ✓ |
| SMD1812P200TF/16 | 2.00 | 3.50 | 16 | 100 | 1.0 | 8.00 | 2.00 | 0.020 | 0.070 | ✓ | ✓ |
| SMD1812P260TFT | 2.60 | 5.00 | 8 | 100 | 0.8 | 8.00 | 2.50 | 0.015 | 0.047 | ✓ | ✓ |
| SMD1812P260TF/12 | 2.60 | 5.00 | 12 | 100 | 0.8 | 8.00 | 5.00 | 0.015 | 0.055 | ✓ | ✓ |
| SMD1812P260TF/16 | 2.60 | 5.00 | 16 | 100 | 1.2 | 8.00 | 5.00 | 0.015 | 0.050 | ✓ | ✓ |
| SMD1812P300TFT | 3.00 | 5.00 | 6 | 100 | 0.8 | 8.00 | 4.00 | 0.012 | 0.040 | ✓ | ✓ |

# SMD1812 HF Series Surface Mount PTC Devices

## Note on Electrical Characteristics

- **Vocabulary**
  - $I_{hold}$ = Hold current: maximum current device will pass without tripping in 23ºC still air.
  - $I_{trip}$ = Trip current: minimum current at which the device will trip in 23 ºC still air.
  - $V_{max}$ = Maximum voltage device can withstand without damage at rated current ($I_{max}$)
  - $I_{max}$ = Maximum fault current device can withstand without damage at rated voltage ($V_{max}$)
  - $P_{d\ typ}$ = Typical power dissipated from device when in the tripped state at 23 ºC still air.
  - $R_{min}$ = Minimum resistance of device in initial (un-soldered) state.
  - $R_{1max}$ = Maximum resistance of device at 23 ºC measured one hour after tripping or reflow soldering of 260 ºC for 20 sec.
- **Value specified is determined by using the PWB with 0.030"*1.5oz copper traces.**
- **Caution: Operation beyond the specified rating may result in damage and possible arcing and flame.**
- **Specifications are subject to change without notice.**

## Polymeric PTC Selecting Guide

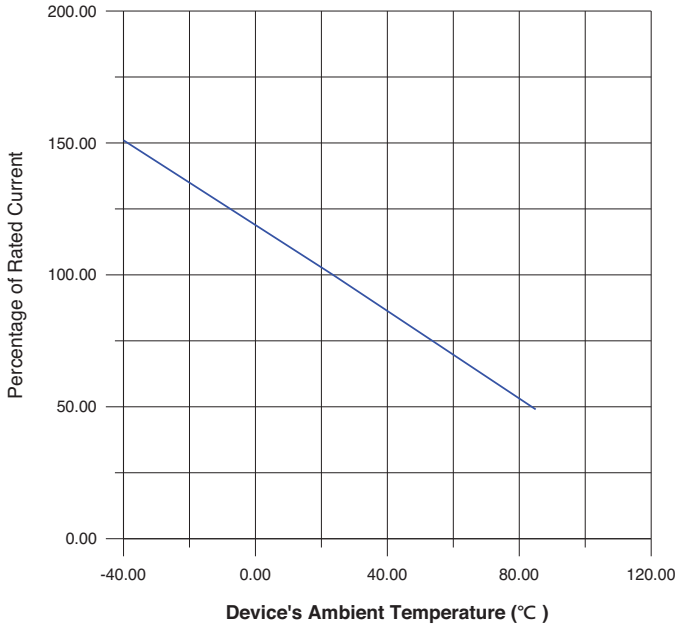
- **Determine the following operating parameters for the circuits:**
  - Normal operating current ($I_{hold}$)
  - Maximum interrupt current ($I_{max}$)
  - Maximum circuit voltage ($V_{max}$)
  - Normal operating temperature surrounding device (minºC/maxºC)
- **Select the device form factor and dimension suitable for the application:**
  - Surface Mount Device (SMD)
  - Axial Leaded Device (ALD)
  - Other Customized Form Factors
  - Radial Leaded Device (RLD)
  - DISC Device
- **Compare the maximum rating for $V_{max}$ and $I_{max}$ of the PPTC device with the circuit in application and make sure the circuit's requirement does not exceed the device rating.**
- **Check that PPTC device's trip time (time-to-trip) will protect the circuit.**
- **Verify that the circuit operating temperature is within the PPTC device's normal operating temperature range.**
- **Verify the performance and suitability of the chosen PPTC device in the application.**

## ⚠WARNING

- **Mechanical Stress**
  - PPTC devices will undergo a thermal expansion during fault condition. If PPTC devices are installed or placed in an application where the space between PPTC devices and the surrounding materials (e.g., covering materials, packaging materials, encapsulate materials and the like) is insufficient, it will cause an inhibiting effect upon the thermal expansion. Pressing, twisting, bending and other kinds of mechanical stress will also adversely affect the performance of the PPTC devices, and shall not be used or applied.
- **Chemical Pollutants**
  - Silicone-based oils, oils, solvents, gels, electrolytes, fuels, acids, and the like will adversely affect the properties of PPTC devices, and shall not be used or applied.
- **Electronic and Thermal Effect**
  - PPTC devices are secondary protection devices and are used solely for sporadic, accidental over-current or over-temperature error condition, and shall NOT be used if or when constant or repeated fault conditions (such fault conditions may be caused by, among others, incorrect pin-connection of a connector) or over-extensive trip events may occur.
  - PTTC devices are different from fuses and, when a fault condition occurs, will go into high-resistance state and do not open circuit, in which case the voltage at such PPTC devices may reach a hazardous level.
  - Operation over the maximum rating or other forms of improper use may cause failure, arcing, flame and/or other damage to the PPTC devices.
  - Conductive material contamination, such as metal particle, may induce shortage, flame or arcing.
  - Due to the inductance, the operation circuits may generate a circuit voltage (Ldi/dt) above the rated voltage of PPTC devices, which shall not be used under such circumstances.
- **General**
  - Customers shall evaluate and test the properties of PPTC devices independently to verify and ensure that their individual applications will be met.
  - The performance of PPTC devices will be adversely affected if they are improperly used under electronic, thermal and/or mechanical procedures and/or conditions non-conformant to those recommended by manufacturer.
  - Customers shall be responsible for determining whether it is necessary to have back-up, failsafe and/or fool-proof protection to avoid or minimize damage that may result from extra-ordinary, irregular function or failure of PPTC devices.
  - Any and all responsibilities and liabilities are disclaimed if any item under this notice of warning is not complied with.

# SMD1812 HF Series Surface Mount PTC Devices

## Thermal Derating Curve




## Thermal Derating Chart

**Recommended Hold Current (A) at Ambient Temperature (°C)**

| Part Number | Ambient Operation Temperature | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | -40 °C | -20 °C | 0 °C | 23 °C | 40 °C | 50 °C | 60 °C | 70 °C | 85 °C |
| SMD1812P010TF | 0.16 | 0.14 | 0.12 | 0.10 | 0.08 | 0.07 | 0.06 | 0.05 | 0.03 |
| SMD1812P010TF/60 | 0.16 | 0.14 | 0.12 | 0.10 | 0.08 | 0.07 | 0.06 | 0.05 | 0.03 |
| SMD1812P014TF | 0.23 | 0.19 | 0.17 | 0.14 | 0.12 | 0.10 | 0.09 | 0.08 | 0.06 |
| SMD1812P020TF | 0.29 | 0.26 | 0.23 | 0.20 | 0.17 | 0.15 | 0.14 | 0.12 | 0.10 |
| SMD1812P020TF-J | 0.29 | 0.26 | 0.23 | 0.20 | 0.17 | 0.15 | 0.14 | 0.12 | 0.10 |
| SMD1812P035TF/30 | 0.50 | 0.45 | 0.40 | 0.35 | 0.30 | 0.26 | 0.24 | 0.20 | 0.16 |
| SMD1812P035TF/60 | 0.50 | 0.45 | 0.40 | 0.35 | 0.30 | 0.26 | 0.24 | 0.20 | 0.16 |
| SMD1812P050TF | 0.77 | 0.68 | 0.59 | 0.50 | 0.44 | 0.40 | 0.37 | 0.33 | 0.29 |
| SMD1812P050TF/30 | 0.77 | 0.68 | 0.59 | 0.50 | 0.44 | 0.40 | 0.37 | 0.33 | 0.29 |
| SMD1812P050TF/60 | 0.77 | 0.68 | 0.59 | 0.50 | 0.44 | 0.40 | 0.37 | 0.33 | 0.29 |
| SMD1812P075TF | 1.15 | 1.01 | 0.88 | 0.75 | 0.65 | 0.60 | 0.55 | 0.49 | 0.43 |
| SMD1812P075TF/24 | 1.06 | 0.95 | 0.84 | 0.75 | 0.60 | 0.55 | 0.50 | 0.45 | 0.37 |
| SMD1812P075TF/33 | 1.10 | 1.00 | 0.88 | 0.75 | 0.66 | 0.60 | 0.56 | 0.47 | 0.36 |
| SMD1812P110TF | 1.59 | 1.43 | 1.26 | 1.10 | 0.95 | 0.87 | 0.80 | 0.71 | 0.60 |
| SMD1812P110TF/16 | 1.58 | 1.43 | 1.27 | 1.10 | 0.95 | 0.85 | 0.77 | 0.71 | 0.58 |
| SMD1812P110TF/24 | 1.55 | 1.40 | 1.25 | 1.10 | 0.93 | 0.83 | 0.73 | 0.63 | 0.50 |
| SMD1812P110TF/33 | 1.55 | 1.40 | 1.25 | 1.10 | 0.93 | 0.83 | 0.73 | 0.63 | 0.50 |
| SMD1812P125TF/16 | 2.00 | 1.75 | 1.52 | 1.25 | 1.00 | 0.95 | 0.90 | 0.75 | 0.53 |
| SMD1812P150TF/8 | 2.06 | 1.93 | 1.79 | 1.50 | 1.28 | 1.10 | 1.02 | 0.80 | 0.68 |
| SMD1812P150TF/12 | 2.04 | 1.88 | 1.68 | 1.50 | 1.25 | 1.10 | 1.00 | 0.80 | 0.60 |

# SMD1812 HF Series Surface Mount PTC Devices

## Thermal Derating Chart

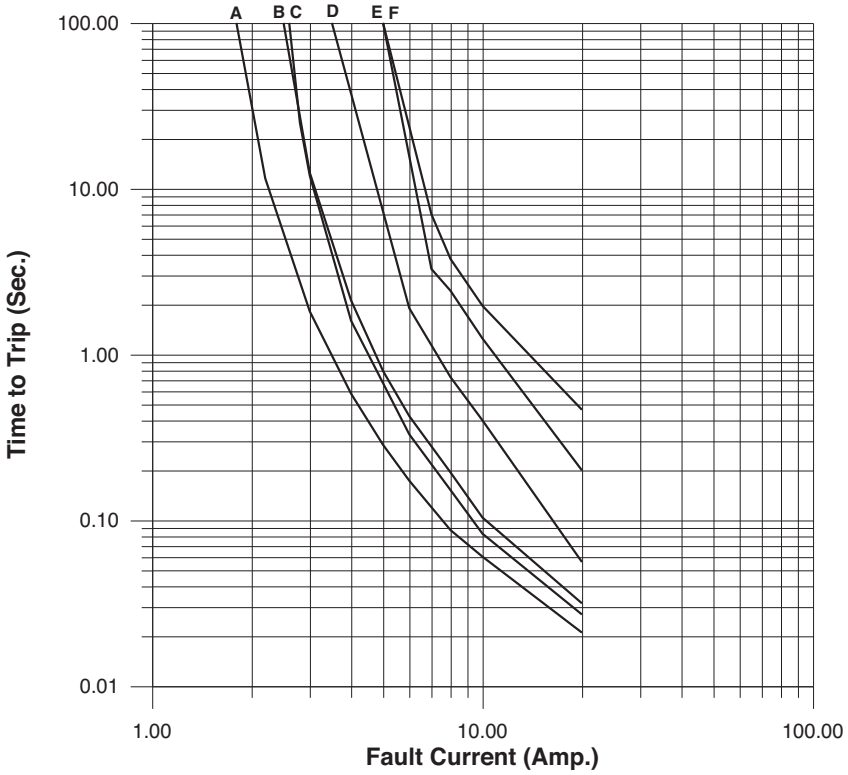
Cont'd

**Recommended Hold Current (A) at Ambient Temperature (°C)**

| Part Number | Ambient Operation Temperature | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | -40 °C | -20 °C | 0 °C | 23 °C | 40 °C | 50 °C | 60 °C | 70 °C | 85 °C |
| SMD1812P150TF/16 | 2.04 | 1.88 | 1.68 | 1.50 | 1.25 | 1.10 | 1.00 | 0.80 | 0.60 |
| SMD1812P150TF/24 | 2.05 | 1.87 | 1.67 | 1.50 | 1.25 | 1.08 | 0.95 | 0.77 | 0.60 |
| SMD1812P160TF/8(4L) | 2.20 | 2.06 | 1.91 | 1.60 | 1.36 | 1.17 | 1.09 | 0.85 | 0.72 |
| SMD1812P200TFT | 2.60 | 2.44 | 2.22 | 2.00 | 1.78 | 1.67 | 1.50 | 1.45 | 1.29 |
| SMD1812P200TF/12 | 2.60 | 2.44 | 2.22 | 2.00 | 1.78 | 1.67 | 1.50 | 1.45 | 1.29 |
| SMD1812P200TF/16 | 2.60 | 2.44 | 2.22 | 2.00 | 1.78 | 1.67 | 1.50 | 1.45 | 1.29 |
| SMD1812P260TFT | 3.40 | 3.16 | 3.00 | 2.60 | 2.30 | 2.15 | 2.00 | 1.85 | 1.63 |
| SMD1812P260TF/12 | 3.40 | 3.16 | 3.00 | 2.60 | 2.30 | 2.15 | 2.00 | 1.85 | 1.63 |
| SMD1812P260TF/16 | 3.40 | 3.16 | 3.00 | 2.60 | 2.30 | 2.15 | 2.00 | 1.85 | 1.63 |
| SMD1812P300TFT | 4.13 | 3.75 | 3.30 | 3.00 | 2.62 | 2.43 | 2.25 | 2.00 | 1.78 |

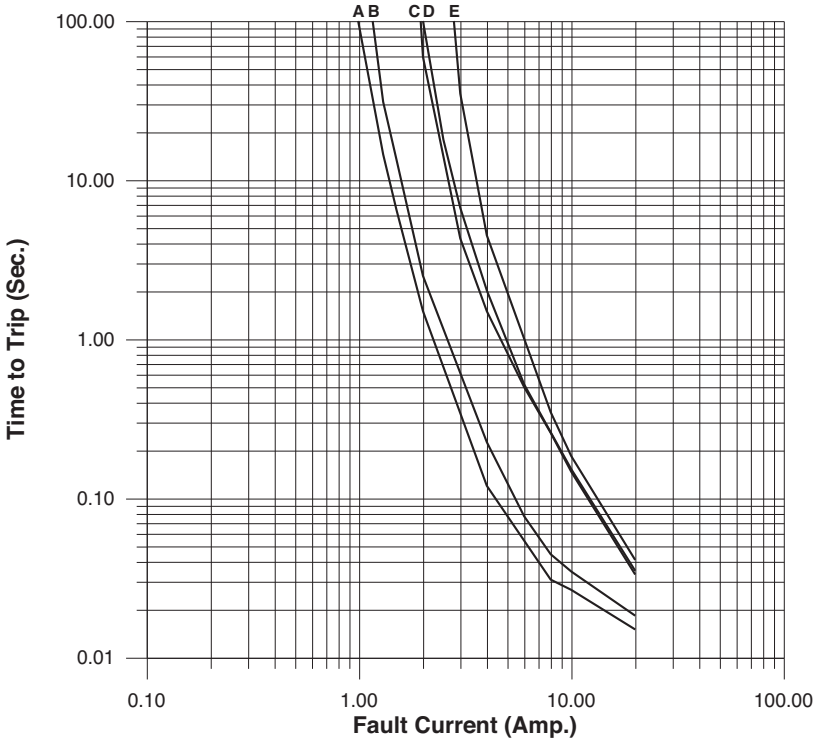
# SMD1812 HF Series Surface Mount PTC Devices

## Average Time-Current Curve




A — SMD1812P110TF
B — SMD1812P150TF/8
C — SMD1812P160TF/8(4L)
D — SMD1812P200TFT
SMD1812P200TF/12
SMD1812P200TF/16
E — SMD1812P260TFT
SMD1812P260TF/12
SMD1812P260TF/16
F — SMD1812P300TFT

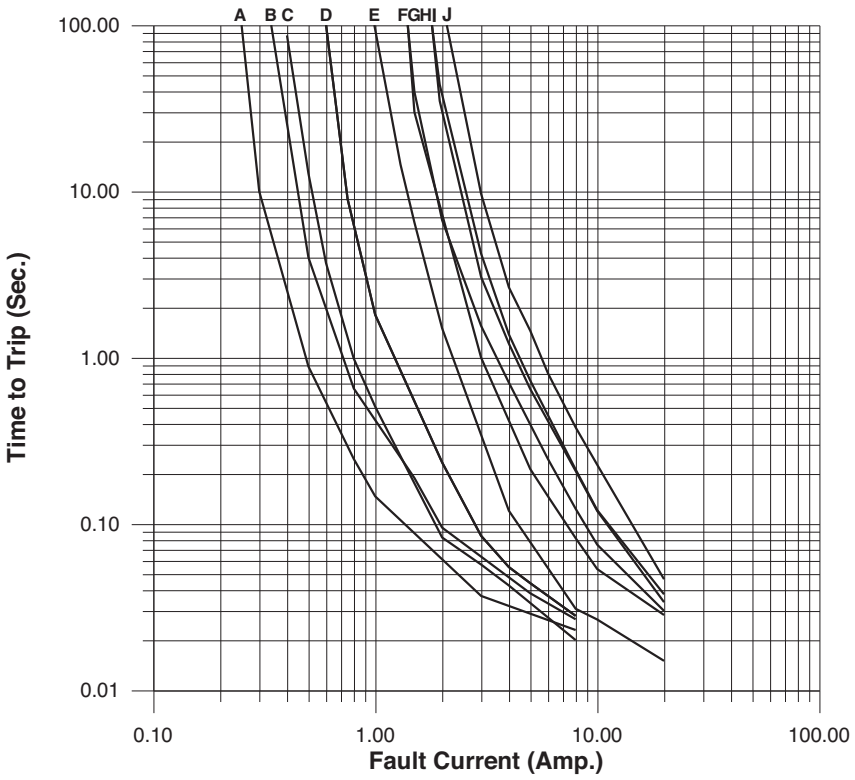
## Average Time-Current Curve




A — SMD1812P050TF
B — SMD1812P075TF
C — SMD1812P110TF/16
D — SMD1812P125TF/16
E — SMD1812P150TF/12
SMD1812P150TF/16

# SMD1812 HF Series Surface Mount PTC Devices

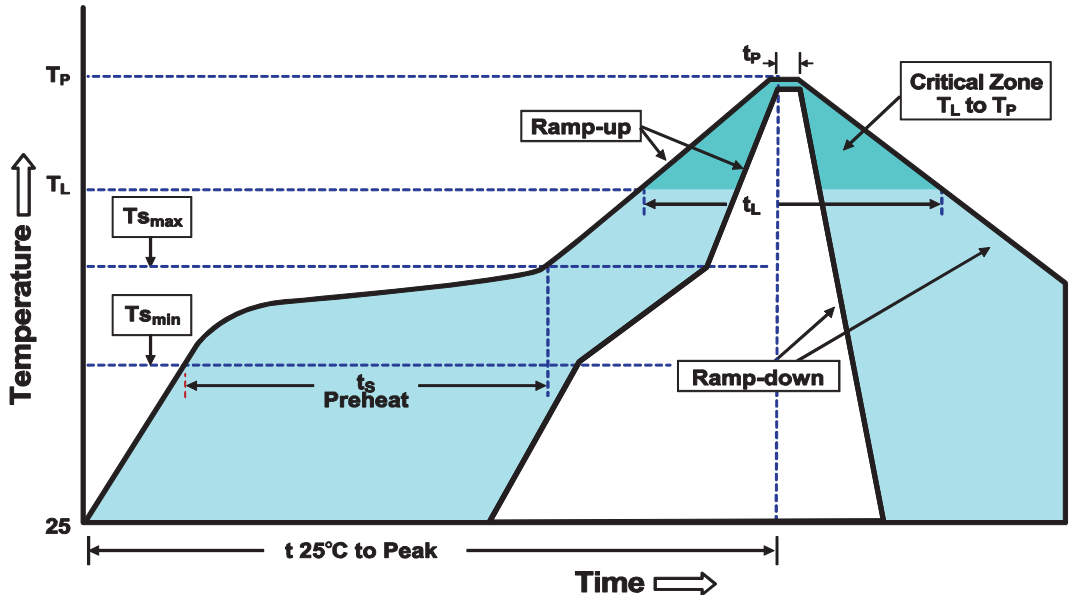
## Average Time-Current Curve




A — SMD1812P010TF
SMD1812P010TF/60
B — SMD1812P014TF
C — SMD1812P020TF
SMD1812P020TF-J
D — SMD1812P035TF/30
SMD1812P035TF/60
E — SMD1812P050TF/30
SMD1812P050TF/60
F — SMD1812P075TF/33
G — SMD1812P075TF/24
H — SMD1812P110TF/33
I — SMD1812P110TF/24
J — SMD1812P150TF/24

# SMD1812 HF Series Surface Mount PTC Devices

## Soldering Parameters




| Profile Feature | Pb-Free Assembly |
|---|---|
| Average Ramp-Up Rate ($Ts_{max}$ to $T_P$) | 3°C/second max. |
| Preheat<br>-Temperature Min ($Ts_{min}$)<br>-Temperature Max ($Ts_{max}$)<br>-Time ($Ts_{min}$ to $Ts_{max}$) | <br>150°C<br>200°C<br>60-180 seconds |
| Time maintained above:<br>-Temperature ($T_L$)<br>-Time ($t_L$) | <br>217°C<br>60-150 seconds |
| Peak Temperature ($T_P$) | 260°C |
| Time within 5°C of actual Peak Temperature ($t_P$) | 20-40 seconds |
| Ramp-Down Rate | 6 °C /second max. |
| Time 25°C to Peak Temperature | 8 minutes max. |
| Storage Condition | 0°C ~35°C, ≦70%RH |

- Recommended reflow methods: IR, vapor phase oven, hot air oven, $N_2$ environment for lead-free
- Recommended maximum paste thickness is 0.25mm (0.010 inch)
- Devices can be cleaned using standard industry methods and solvents.

**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.

# SMD1812 HF Series Surface Mount PTC Devices

## Physical Dimensions (mm.)

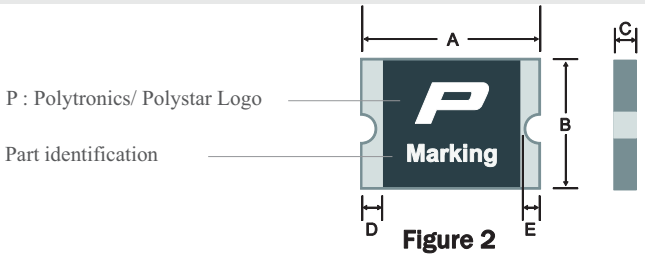



Figure 2

| Part Number | A | | B | | C | | D | | E | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. |
| SMD1812P010TF | 4.37 | 4.73 | 3.07 | 3.41 | 0.75 | 1.25 | 0.30 | 1.20 | 0.15 | 0.65 |
| SMD1812P010TF/60 | 4.37 | 4.73 | 3.07 | 3.41 | 0.75 | 1.25 | 0.30 | 1.20 | 0.15 | 0.65 |
| SMD1812P014TF | 4.37 | 4.73 | 3.07 | 3.41 | 0.75 | 1.95 | 0.30 | 1.20 | 0.15 | 0.65 |
| SMD1812P020TF | 4.37 | 4.73 | 3.07 | 3.41 | 0.55 | 1.00 | 0.30 | 1.20 | 0.15 | 0.65 |
| SMD1812P020TF-J | 4.37 | 4.73 | 3.07 | 3.41 | 0.75 | 1.25 | 0.30 | 1.20 | 0.15 | 0.65 |
| SMD1812P035TF/30 | 4.37 | 4.73 | 3.07 | 3.41 | 0.65 | 1.25 | 0.30 | 1.20 | 0.15 | 0.65 |
| SMD1812P035TF/60 | 4.37 | 4.73 | 3.07 | 3.41 | 1.20 | 1.80 | 0.30 | 1.20 | 0.15 | 0.65 |
| SMD1812P050TF | 4.37 | 4.73 | 3.07 | 3.41 | 0.50 | 0.75 | 0.30 | 1.20 | 0.15 | 0.50 |
| SMD1812P050TF/30 | 4.37 | 4.73 | 3.07 | 3.41 | 0.50 | 1.00 | 0.30 | 1.20 | 0.15 | 0.65 |
| SMD1812P050TF/60 | 4.37 | 4.73 | 3.07 | 3.41 | 1.20 | 1.80 | 0.30 | 1.20 | 0.15 | 0.65 |
| SMD1812P075TF | 4.37 | 4.73 | 3.07 | 3.41 | 0.50 | 0.75 | 0.30 | 1.20 | 0.15 | 0.50 |
| SMD1812P075TF/24 | 4.37 | 4.73 | 3.07 | 3.41 | 0.75 | 1.55 | 0.30 | 1.20 | 0.15 | 0.65 |
| SMD1812P075TF/33 | 4.37 | 4.73 | 3.07 | 3.41 | 0.75 | 1.55 | 0.30 | 1.20 | 0.15 | 0.65 |
| SMD1812P110TF | 4.37 | 4.73 | 3.07 | 3.41 | 0.30 | 0.71 | 0.30 | 1.20 | 0.15 | 0.65 |
| SMD1812P110TF/16 | 4.37 | 4.73 | 3.07 | 3.41 | 0.75 | 1.25 | 0.30 | 1.20 | 0.15 | 0.65 |
| SMD1812P110TF/24 | 4.37 | 4.73 | 3.07 | 3.41 | 0.55 | 1.07 | 0.30 | 1.20 | 0.15 | 0.65 |
| SMD1812P110TF/33 | 4.37 | 4.73 | 3.07 | 3.41 | 1.20 | 2.00 | 0.30 | 1.20 | 0.15 | 0.65 |
| SMD1812P125TF/16 | 4.37 | 4.73 | 3.07 | 3.41 | 0.75 | 1.25 | 0.30 | 1.20 | 0.15 | 0.65 |
| SMD1812P150TF/8 | 4.37 | 4.73 | 3.07 | 3.41 | 0.40 | 0.71 | 0.30 | 1.20 | 0.15 | 0.65 |
| SMD1812P150TF/12 | 4.37 | 4.73 | 3.07 | 3.41 | 0.75 | 1.25 | 0.30 | 1.20 | 0.15 | 0.65 |
| SMD1812P150TF/16 | 4.37 | 4.73 | 3.07 | 3.41 | 0.75 | 1.25 | 0.30 | 1.20 | 0.15 | 0.65 |
| SMD1812P150TF/24 | 4.37 | 4.73 | 3.07 | 3.41 | 0.80 | 1.80 | 0.30 | 1.20 | 0.15 | 0.65 |
| SMD1812P160TF/8(4L) | 4.37 | 4.73 | 3.07 | 3.41 | 0.40 | 0.75 | 0.30 | 1.20 | 0.15 | 0.65 |
| SMD1812P200TFT | 4.37 | 4.73 | 3.07 | 3.41 | 0.20 | 0.60 | 0.30 | 1.20 | 0.15 | 0.65 |
| SMD1812P200TF/12 | 4.37 | 4.73 | 3.07 | 3.41 | 0.80 | 1.20 | 0.30 | 1.20 | 0.15 | 0.65 |
| SMD1812P200TF/16 | 4.37 | 4.73 | 3.07 | 3.41 | 0.80 | 1.20 | 0.30 | 1.20 | 0.15 | 0.65 |
| SMD1812P260TFT | 4.37 | 4.73 | 3.07 | 3.41 | 0.50 | 1.00 | 0.30 | 1.20 | 0.15 | 0.65 |
| SMD1812P260TF/12 | 4.37 | 4.73 | 3.07 | 3.41 | 0.80 | 1.34 | 0.30 | 1.20 | 0.15 | 0.65 |
| SMD1812P260TF/16 | 4.54 | 4.90 | 3.16 | 3.50 | 1.20 | 2.00 | 0.30 | 1.20 | 0.15 | 0.65 |
| SMD1812P300TFT | 4.37 | 4.73 | 3.07 | 3.41 | 0.50 | 1.00 | 0.30 | 1.20 | 0.15 | 0.65 |

# SMD1812 HF Series Surface Mount PTC Devices

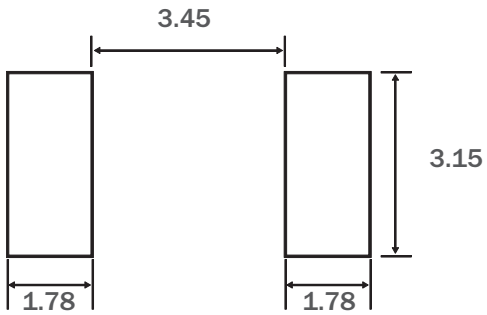
## Environmental Specifications

| | |
|---|---|
| Operating Temperature | -40°C to +85 °C |
| Maximum Device Surface Temperature in Tripped State | 125°C |
| Passive Aging | +85°C , 1000 hours<br>±5% typical resistance change |
| Humidity Aging | +85°C , 85%R.H. 1000 hours<br>±5% typical resistance change |
| Thermal Shock | MIL-STD-202 Method 107G<br>+85°C /-40°C 20 times<br>-30% typical resistance change |
| Solvent Resistance | MIL-STD-202, Method 215<br>No change |
| Vibration | MIL-STD-883C, Method 2007.1, Condition A<br>No change |
| Moisture Sensitivity Level | Level 1, J-STD-020C |

# SMD1812 HF Series Surface Mount PTC Devices

## Packaging Quantity and Marking

Recommended Pad Layout (mm.)




| Part Number | Marking | Quantity |
|---|---|---|
| SMD1812P010TF | 010 | 1500 |
| SMD1812P010TF/60 | 0160 | 1500 |
| SMD1812P014TF | 014 | 1500 |
| SMD1812P020TF | 020 | 2000 |
| SMD1812P020TF-J | 020・J | 1500 |
| SMD1812P035TF/30 | 0330 | 1500 |
| SMD1812P035TF/60 | 0360 | 1000 |
| SMD1812P050TF | 050 | 2000 |
| SMD1812P050TF/30 | 0530 | 2000 |
| SMD1812P050TF/60 | 0560 | 1000 |
| SMD1812P075TF | 075 | 2000 |
| SMD1812P075TF/24 | 0724 | 1500 |
| SMD1812P075TF/33 | 0733 | 1500 |
| SMD1812P110TF | 110 | 2000 |
| SMD1812P110TF/16 | 1116 | 1500 |
| SMD1812P110TF/24 | 1124 | 1500 |
| SMD1812P110TF/33 | 1133 | 1000 |
| SMD1812P125TF/16 | 125 | 1500 |
| SMD1812P150TF/8 | 150 | 2000 |
| SMD1812P150TF/12 | 1512 | 1500 |
| SMD1812P150TF/16 | 1516 | 1500 |
| SMD1812P150TF/24 | 1524 | 1000 |
| SMD1812P160TF/8(4L) | 160 | 2000 |
| SMD1812P200TFT | 20 | 2000 |
| SMD1812P200TF/12 | 2012 | 1500 |
| SMD1812P200TF/16 | 2016 | 1500 |
| SMD1812P260TFT | 260 | 1500 |
| SMD1812P260TF/12 | 2612 | 1000 |
| SMD1812P260TF/16 | 2616 | 1000 |
| SMD1812P300TFT | 30 | 1500 |

◎ 12 mm tape on 7 inch reel per EIA-481 (equivalent to IEC286, part 3)

# SMD1812 HF Series Surface Mount PTC Devices

## Physical Specifications

| | |
|---|---|
| Terminal Material | Solder-Plated Copper (Solder Material: Matte Tin (Sn)) |
| Lead Solderability | Meets EIA Specification RS186-9E, ANSI/J-STD-002 Category 3. |

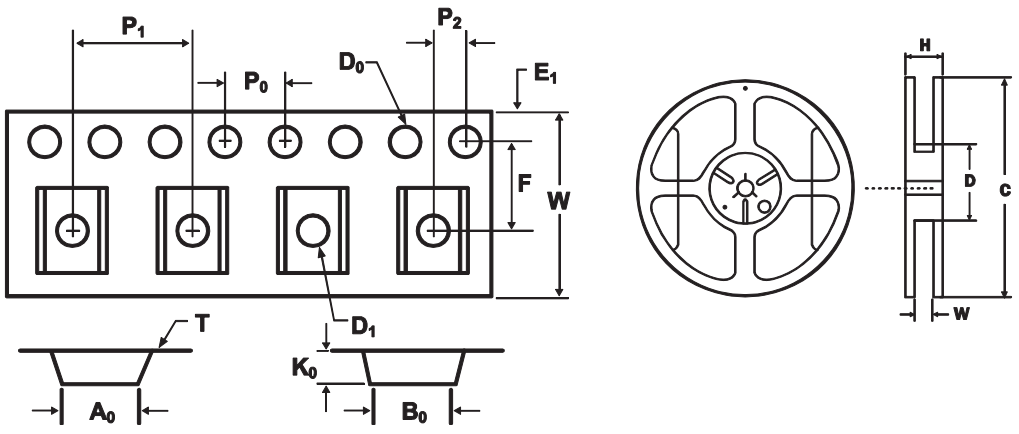
# SMD1812 HF Series Surface Mount PTC Devices

## Tape Specifications: EIA-481 (mm.)

| | P020TF<br>P050TF, P050TF/30,<br>P075TF, P110TF<br>P160TF/8(4L)<br>P150TF/8<br>P200TFT | P010TF, P010TF/60<br>P014TF, P020TF-J<br>P035TF/30<br>P075TF/24, P075TF/33<br>P110TF/16, P110TF/24<br>P125TF/16, P150TF/12<br>P150TF/16<br>P200TF/12, P200TF/16<br>P260TFT, P300TFT | P035TF/60<br>P050TF/60<br>P110TF/33<br>P150TF/24<br>P260TF/12<br>P260TF/16 |
|---|---|---|---|
| W | 12.00 ± 0.30 | 12.00 ± 0.30 | 12.00 ± 0.10 |
| F | 5.50 ± 0.05 | 5.50 ± 0.05 | 5.50 ± 0.05 |
| $E_1$ | 1.75 ± 0.10 | 1.75 ± 0.10 | 1.75 ± 0.10 |
| $D_0$ | 1.55 ± 0.05 | 1.55 ± 0.05 | 1.55 ± 0.05 |
| $D_1$ | 1.55 (MIN) | 1.50 ± 0.10 | 1.50 (MIN) |
| $P_0$ | 4.00 ± 0.10 | 4.00 ± 0.10 | 4.00 ± 0.08 |
| $P_1$ | 8.00 ± 0.10 | 8.00 ± 0.10 | 8.00 ± 0.10 |
| $P_2$ | 2.00 ± 0.05 | 2.00 ± 0.05 | 2.00 ± 0.05 |
| $A_0$ | 3.58 ± 0.10 | 3.50 ± 0.10 | 3.58 ± 0.10 |
| $B_0$ | 4.93 ± 0.10 | 4.85 ± 0.10 | 4.93 ± 0.10 |
| T | 0.25 ± 0.10 | 0.25 ± 0.10 | 0.25 ± 0.10 |
| $K_0$ | 0.87 ± 0.06 | 1.25 ± 0.10 | 2.10 ± 0.10 |
| Leader min. | 390 | 390 | 390 |
| Trailer min. | 160 | 160 | 160 |

## Reel Dimensions: EIA-481 (mm.)

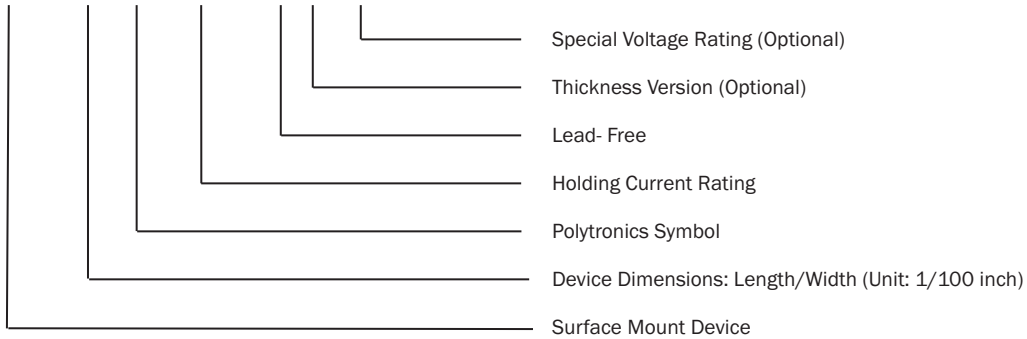
| | |
|---|---|
| C | Ø178 ± 1.0 |
| D | Ø60.2 ± 0.5 |
| H | 16.0 ± 0.5 |
| W | 13.2 ± 1.5 |



# SMD1812 HF Series Surface Mount PTC Devices

## Part Number System

SMD 1812 P □□□ TF T /□□




## Cross Reference

| Polytronics / EVERFUSE® | Cross Reference | |
|---|---|---|
| | TE Connectivity / PolySwitch® | Bourns / Multifuse® |
| **SMD1812P010TF** | miniSMDC010F | MF-MSMF010 |
| **SMD1812P010TF/60** | miniSMDC010F | MF-MSMF010 |
| **SMD1812P014TF** | miniSMDC014F | MF-MSMF014 |
| **SMD1812P020TF** | miniSMDC020F | MF-MSMF020 |
| **SMD1812P020TF-J** | - | MF-MSMF020/60 |
| **SMD1812P035TF/30** | - | - |
| **SMD1812P035TF/60** | - | - |
| **SMD1812P050TF** | miniSMDC050F | MF-MSMF050 |
| **SMD1812P050TF/30** | - | - |
| **SMD1812P050TF/60** | - | - |
| **SMD1812P075TF** | miniSMDC075F | MF-MSMF075 |
| **SMD1812P075TF/24** | miniSMDM075F/24 | MF-MSMF075/24 |
| **SMD1812P075TF/33** | - | - |
| **SMD1812P110TF** | miniSMDC110F | MF-MSMF110 |
| **SMD1812P110TF/16** | miniSMDC110F/16 | MF-MSMF110/16 |
| **SMD1812P110TF/24** | miniSMDC110F/24 | - |
| **SMD1812P110TF/33** | - | - |
| **SMD1812P125TF/16** | miniSMDC125F/16 | MF-MSMF125 |
| **SMD1812P150TF/8** | miniSMDC150F | MF-MSMF150 |
| **SMD1812P150TF/12** | miniSMDC150F/12 | - |
| **SMD1812P150TF/16** | miniSMDC150F/16 | - |
| **SMD1812P150TF/24** | miniSMDM150F/24 | - |
| **SMD1812P160TF/8(4L)** | miniSMDM160F | MF-MSMF160 |
| **SMD1812P200TFT** | miniSMDC200F | MF-MSMF200 |
| **SMD1812P200TF/12** | - | - |
| **SMD1812P200TF/16** | - | - |
| **SMD1812P260TFT** | miniSMDC260F | MF-MSMF260 |
| **SMD1812P260TF/12** | miniSMDC260F/12 | - |
| **SMD1812P260TF/16** | miniSMDC260F/16 | - |
| **SMD1812P300TFT** | miniSMDC300F | - |

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