

## Description

The 1206 series provides miniature surface mount resettable overcurrent protection with holding current from 0.05A to 2.0A. This series is suitable for wide range of applications in modern electronics where space limited.

## Application

- \* USB peripherals
- \* Disk drives
- \* CD-ROMs
- \* General electronics
- \* Disk drives
- \* Set-top-box and HDMI
- \* Mobile Internet Device (MID)
- \* PADs/digital cameras
- \* Game console port protection
- \* Plug and play protection for motherboards and peripherals
- \* Mobile phones-battery and port protection

## Features

- \* I(hold):0.05~3.0A
- \* Very high voltage surge capabilities
- \* Available in lead-free version
- \* Fast response to fault current
- \* RoHS compliant, Lead-Free and Halogen-Free
- \* Low resistance
- \* Compact design saves board space
- \* Compatible with high temperature solders

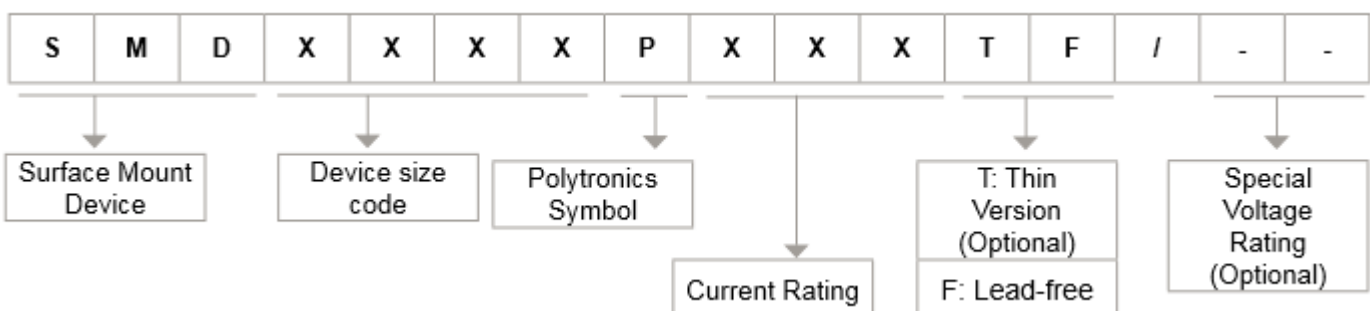
## Device Diagram



## Ordering Information

| Part Number | Packaging | Reel Size   |
|-------------|-----------|-------------|
| SMD1206     | 3500/4500 | Tape & Reel |

## Product Name

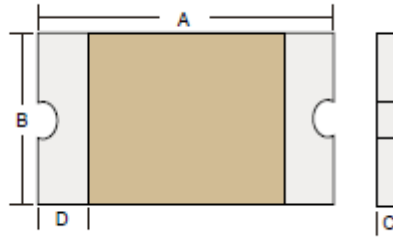


# SMD1206 Series



## Lead style code

Dimensions  
(mm)



| Type Number        | Ihold | Itrip | Maximum Time To Trip |             | Vmax | Imax | Pd type | Rmin  | R1max | Package | Package Dimensions (mm) |     |     |     |     |     |      |
|--------------------|-------|-------|----------------------|-------------|------|------|---------|-------|-------|---------|-------------------------|-----|-----|-----|-----|-----|------|
|                    | A     | A     | Current A            | Time (Sec.) | VDC  | A    | W       | Ω     | Ω     |         | A                       |     | B   |     | C   |     | D    |
|                    | min   | max   | min                  | max         | min  | max  | min     | max   | min   |         | min                     | max | min | max | min |     |      |
| SMD1206P005TF      | 0.05  | 0.15  | 0.25                 | 1.5         | 60   | 100  | 0.4     | 3.6   | 50    | 1206    | 3                       | 3.5 | 1.5 | 1.8 | 0.7 | 1.3 | 0.15 |
| SMD1206P010TF      | 0.1   | 0.25  | 0.5                  | 1           | 60   | 100  | 0.4     | 1.6   | 15    | 1206    | 3                       | 3.5 | 1.5 | 1.8 | 0.7 | 1.3 | 0.15 |
| SMD1206P012TF      | 0.12  | 0.29  | 0.2                  | 0.2         | 60   | 100  | 0.6     | 1.5   | 6     | 1206    | 3                       | 3.5 | 1.5 | 1.8 | 0.7 | 1.3 | 0.15 |
| SMD1206P016TF      | 0.16  | 0.37  | 0.3                  | 0.3         | 30   | 100  | 0.6     | 1.2   | 4.5   | 1206    | 3                       | 3.5 | 1.5 | 1.8 | 0.7 | 1.3 | 0.15 |
| SMD1206P020TF      | 0.2   | 0.46  | 8                    | 0.08        | 30   | 100  | 0.6     | 0.35  | 2.5   | 1206    | 3                       | 3.5 | 1.5 | 1.8 | 0.7 | 1.3 | 0.15 |
| SMD1206P025TF      | 0.25  | 0.5   | 8                    | 0.08        | 16   | 100  | 0.6     | 0.35  | 2.5   | 1206    | 3                       | 3.5 | 1.5 | 1.8 | 0.7 | 1.3 | 0.15 |
| SMD1206P035TF      | 0.35  | 0.75  | 8                    | 0.1         | 6    | 100  | 0.6     | 0.25  | 1.3   | 1206    | 3                       | 3.5 | 1.5 | 1.8 | 0.7 | 1.3 | 0.15 |
| SMD1206P035TF/16   | 0.35  | 0.75  | 8                    | 0.1         | 16   | 100  | 0.6     | 0.25  | 1.3   | 1206    | 3                       | 3.5 | 1.5 | 1.8 | 0.9 | 1.6 | 0.15 |
| SMD1206P035TF/24   | 0.35  | 0.75  | 8                    | 0.1         | 24   | 100  | 0.6     | 0.25  | 1.3   | 1206    | 3                       | 3.5 | 1.5 | 1.8 | 0.9 | 1.6 | 0.15 |
| SMD1206P050TF      | 0.5   | 1     | 8                    | 0.1         | 16   | 100  | 0.6     | 0.15  | 0.7   | 1206    | 3                       | 3.5 | 1.5 | 1.8 | 0.5 | 1.0 | 0.15 |
| SMD1206P050TF/13.2 | 0.5   | 1     | 8                    | 0.1         | 13.2 | 100  | 0.6     | 0.15  | 0.7   | 1206    | 3                       | 3.5 | 1.5 | 1.8 | 0.5 | 1.0 | 0.15 |
| SMD1206P050TF/16   | 0.5   | 1     | 8                    | 0.1         | 6    | 100  | 0.6     | 0.15  | 0.7   | 1206    | 3                       | 3.5 | 1.5 | 1.8 | 0.8 | 1.4 | 0.15 |
| SMD1206P050TF/24   | 0.5   | 1     | 8                    | 0.1         | 24   | 100  | 0.6     | 0.15  | 0.7   | 1206    | 3                       | 3.5 | 1.5 | 1.8 | 0.9 | 1.6 | 0.15 |
| SMD1206P075TF      | 0.75  | 1.5   | 8                    | 0.2         | 6    | 100  | 0.6     | 0.09  | 0.5   | 1206    | 3                       | 3.5 | 1.5 | 1.8 | 0.4 | 0.8 | 0.15 |
| SMD1206P075TF/13.2 | 0.75  | 1.5   | 8                    | 0.2         | 13.2 | 100  | 0.6     | 0.09  | 0.5   | 1206    | 3                       | 3.5 | 1.5 | 1.8 | 0.8 | 1.4 | 0.15 |
| SMD1206P075TF/16   | 0.75  | 1.5   | 8                    | 0.2         | 16   | 100  | 0.6     | 0.09  | 0.5   | 1206    | 3                       | 3.5 | 1.5 | 1.8 | 0.9 | 1.6 | 0.15 |
| SMD1206P075TF/24   | 0.75  | 1.5   | 8                    | 0.2         | 24   | 100  | 0.6     | 0.09  | 0.5   | 1206    | 3                       | 3.5 | 1.5 | 1.8 | 0.9 | 1.6 | 0.15 |
| SMD1206P100TF      | 1     | 1.8   | 8                    | 0.3         | 6    | 100  | 0.6     | 0.055 | 0.27  | 1206    | 3                       | 3.5 | 1.5 | 1.8 | 0.4 | 0.8 | 0.15 |
| SMD1206P110TF      | 1.1   | 2.2   | 8                    | 0.3         | 6    | 100  | 0.8     | 0.04  | 0.18  | 1206    | 3                       | 3.5 | 1.5 | 1.8 | 0.4 | 0.8 | 0.15 |
| SMD1206P150TF      | 1.5   | 3     | 8                    | 1           | 6    | 100  | 0.8     | 0.04  | 0.13  | 1206    | 3                       | 3.5 | 1.5 | 1.8 | 0.6 | 1.2 | 0.15 |
| SMD1206P150TF/16   | 1.5   | 3     | 8                    | 1           | 16   | 100  | 0.8     | 0.04  | 0.13  | 1206    | 3                       | 3.5 | 1.5 | 1.8 | 0.8 | 1.4 | 0.15 |
| SMD1206P200TF      | 2     | 3.5   | 8                    | 1.5         | 6    | 100  | 0.8     | 0.018 | 0.08  | 1206    | 3                       | 3.5 | 1.5 | 1.8 | 0.4 | 1.4 | 0.15 |
| SMD1206P300TF      | 3     | 3     | 8                    | 4           | 6    | 100  | 0.8     | 0.01  | 0.005 | 1206    | 3                       | 3.5 | 1.5 | 1.8 | 0.9 | 1.6 | 0.15 |

1)Ihold=Hold current: maximum current device will pass without tripping in 25°C still air.

2)Itrip=Trip current: minimum current at which the device will trip in 25°C still air.

3)Vmax=Maximum voltage device can withstand without damage at rated current (I max).

4)Imax=Maximum fault current device can withstand without damage at rated voltage.

5)Pd type=Typical power dissipated from device when in the tripped state at 25°C still air.

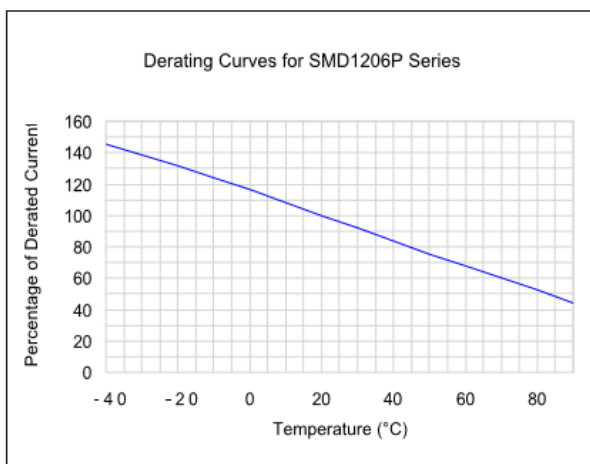
6)Rmin=Minimum resistance of device in initial (un-soldered) state.

7)R1max=Maximum resistance of device at 25°C measured one hour after tripping or reflow soldering of 260°C for 20 sec.

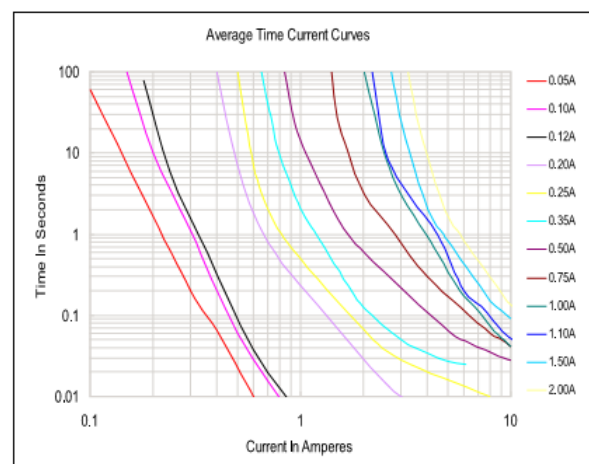
# SMD1206 Series

## Thermal Derating Chart-IH(A) Recommended Hold Current (A) at Ambient Temperature (°C)

| Type Number        | -40°C | -20°C | 0°C   | 25°C | 40°C  | 50°C | 60°C | 70°C | 85°C |
|--------------------|-------|-------|-------|------|-------|------|------|------|------|
| SMD1206P005TF      | 0.08  | 0.07  | 0.06  | 0.05 | 0.04  | 0.04 | 0.03 | 0.03 | 0.02 |
| SMD1206P010TF      | 0.14  | 0.33  | 0.115 | 0.1  | 0.085 | 0.08 | 0.07 | 0.06 | 0.05 |
| SMD1206P012TF      | 0.18  | 0.16  | 0.14  | 0.12 | 0.10  | 0.09 | 0.08 | 0.07 | 0.05 |
| SMD1206P016TF      | 0.22  | 0.2   | 0.18  | 0.16 | 0.14  | 0.12 | 0.10 | 0.9  | 0.8  |
| SMD1206P020TF      | 0.28  | 0.25  | 0.23  | 0.2  | 0.17  | 0.15 | 0.14 | 0.12 | 0.09 |
| SMD1206P025TF      | 0.37  | 0.33  | 0.29  | 0.25 | 0.22  | 0.20 | 0.17 | 0.15 | 0.12 |
| SMD1206P035TF      | 0.50  | 0.45  | 0.40  | 0.35 | 0.30  | 0.27 | 0.24 | 0.21 | 0.12 |
| SMD1206P035TF/16   | 0.50  | 0.45  | 0.40  | 0.35 | 0.30  | 0.27 | 0.24 | 0.21 | 0.12 |
| SMD1206P035TF/24   | 0.50  | 0.45  | 0.40  | 0.35 | 0.30  | 0.27 | 0.24 | 0.21 | 0.12 |
| SMD1206P050TF      | 0.71  | 0.64  | 0.57  | 0.50 | 0.42  | 0.39 | 0.35 | 0.31 | 0.25 |
| SMD1206P050TF/13.2 | 0.71  | 0.64  | 0.57  | 0.50 | 0.42  | 0.39 | 0.35 | 0.31 | 0.25 |
| SMD1206P050TF/16   | 0.71  | 0.64  | 0.57  | 0.50 | 0.42  | 0.39 | 0.35 | 0.31 | 0.25 |
| SMD1206P050TF/24   | 0.71  | 0.64  | 0.57  | 0.50 | 0.42  | 0.39 | 0.35 | 0.31 | 0.25 |
| SMD1206P075TF      | 1.14  | 1.01  | 0.88  | 0.75 | 0.65  | 0.59 | 0.54 | 0.49 | 0.41 |
| SMD1206P075TF/13.2 | 1.14  | 1.01  | 0.88  | 0.75 | 0.65  | 0.59 | 0.54 | 0.49 | 0.41 |
| SMD1206P075TF/16   | 1.14  | 1.01  | 0.88  | 0.75 | 0.65  | 0.59 | 0.54 | 0.49 | 0.41 |
| SMD1206P075TF/24   | 1.14  | 1.01  | 0.88  | 0.75 | 0.65  | 0.59 | 0.54 | 0.49 | 0.41 |
| SMD1206P110TF      | 1.64  | 1.46  | 1.30  | 1.10 | 0.92  | 0.83 | 0.80 | 0.65 | 0.52 |
| SMD1206P150TF      | 2.20  | 1.99  | 1.77  | 1.50 | 1.34  | 1.23 | 1.10 | 1.01 | 0.84 |
| SMD1206P150TF/16   | 2.20  | 1.99  | 1.77  | 1.50 | 1.34  | 1.23 | 1.10 | 1.01 | 0.84 |
| SMD1206P200TF      | 2.60  | 2.44  | 2.35  | 2.00 | 1.78  | 1.67 | 1.50 | 1.45 | 1.10 |
| SMD1206P300TF      | 4.05  | 3.66  | 3.36  | 3.00 | 2.50  | 2.28 | 2.00 | 1.62 | 1.35 |

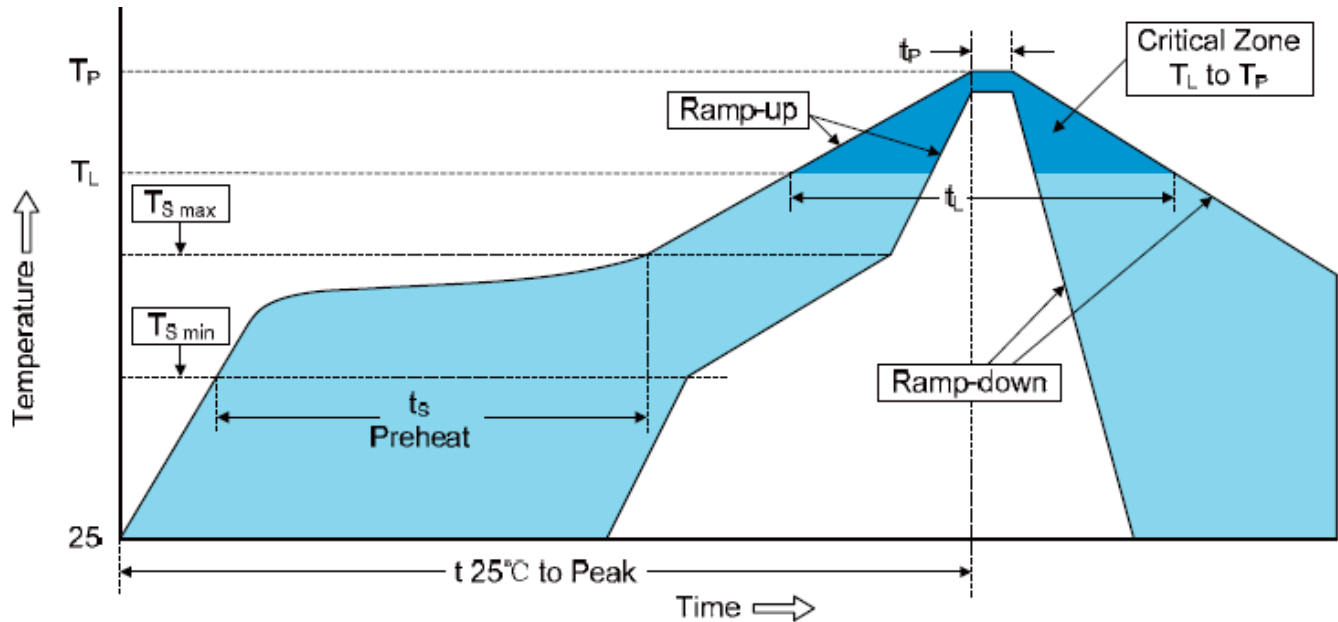


**Thermal Derating Curve**



**Average Time-Current Curve**

Soldering Parameters



| Profile Feature  | Pb-Free Assembly                 |
|--|----------------------------------|
| Average ramp-up rate ( $T_{S\ max}$ to $T_P$ )   | 3°C/second max.                  |
| Preheat<br>-Temperature Min ( $T_{S\ min}$ )<br>-Temperature Max ( $T_{S\ max}$ )<br>-Time (min to max) ( $T_{S\ min}$ to $T_{S\ max}$ ) | 150°C<br>200°C<br>60-180 seconds |
| Time maintained above:<br>-Temperature ( $T_L$ )<br>-Time ( $t_L$ )  | 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<sub>2</sub> environment for lead-free
- Recommended maximum paste thickness is 0.25mm (0.010 inch)
- Device can be cleaned using standard industry methods and solvents.

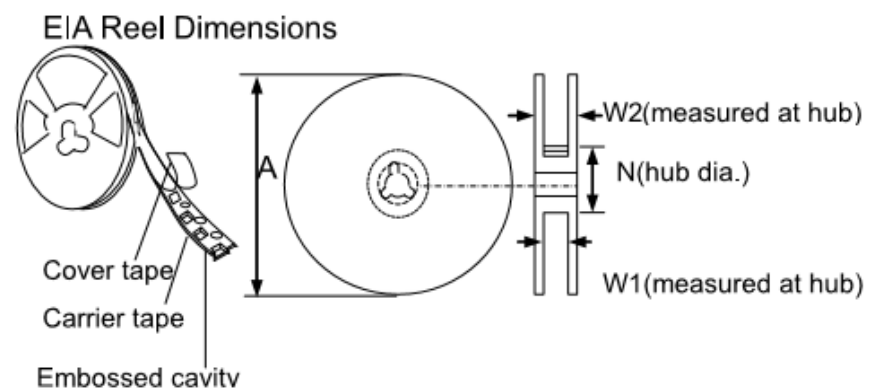
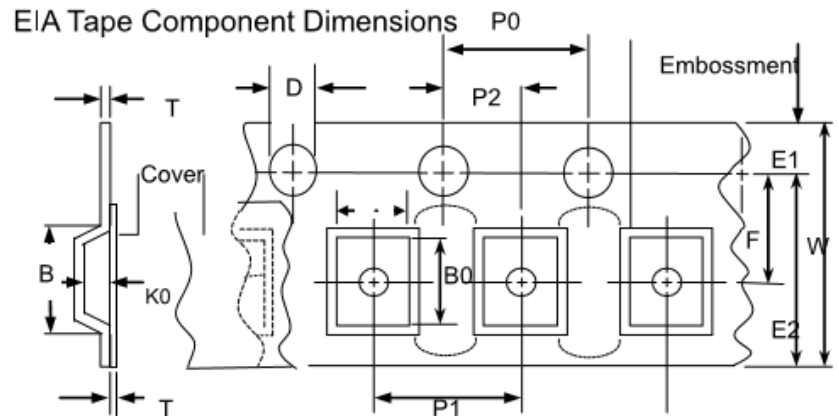
Note 1: All temperature refer to topside of the package, measured on the package body surface.

Note 2: If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.

# SMD1206 Series

## Tape and Reel Specifications

| Governing Specifications | EIA 481-1        |
|--------------------------|------------------|
| W                        | $8.15 \pm 0.3$   |
| P0                       | $4.0 \pm 0.10$   |
| P1                       | $4.0 \pm 0.10$   |
| P2                       | $2.0 \pm 0.05$   |
| A0                       | $1.95 \pm 0.10$  |
| B0                       | $3.40 \pm 0.10$  |
| B1max.                   | 4.35             |
| D0                       | $1.50 + 0.1, -0$ |
| F                        | $3.5 \pm 0.05$   |
| E1                       | $1.75 \pm 0.10$  |
| E2min.                   | 6.25             |
| T                        | 0.6              |
| T1max.                   | 0.1              |
| K0                       | $1.04 \pm 0.1$   |
| Leader min.              | 390              |
| Trailer min.             | 160              |
| Reel Dimensions          |                  |
| A max.                   | 178              |
| N min.                   | 60               |
| W1                       | $9 \pm 0.5$      |
| W2                       | $12.6 \pm 0.5$   |



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