

## Surface Mountable PTC Resettable Fuse: SMD1812 Series

### 1. Summary

- (a) RoHS Compliant & Halogen Free
- (b) Applications: All high-density boards
- (c) Product Features: 1812 Dimension, surface mountable, Solid state, Faster time to trip than standard SMD devices.
- (d) Operation Current: 0.30~5.00A
- (e) Maximum Voltage: 6V~60V<sub>DC</sub>
- (f) Temperature Range : -40°C to 85°C

2. Agency Recognition UL: File No. E211981 TÜV: File No. R50004084

### 3. Electrical Characteristics (23°C)

Part Number	Hold Current I <sub>H</sub> , A	Trip Current I <sub>T</sub> , A	Rated Voltage V <sub>MAX</sub> , V <sub>DC</sub>	Max Current I <sub>MAX</sub> , A	Typical Power Pd, W	Max Time to Trip		Resistance	
						Current A	Time Sec	R <sub>MIN</sub> Ohms	R <sub>1MAX</sub> Ohms
						SMD010-1812	0.10	0.30	60
SMD014-1812	0.14	0.30	60	100	0.8	8.00	0.008	1.200	6.500
SMD020-1812	0.20	0.40	30	100	0.8	8.00	0.020	0.800	5.000
SMD020-60-1812	0.20	0.40	60	100	0.8	8.00	0.020	0.800	5.000
SMD030-1812	0.30	0.60	30	100	0.8	8.00	0.100	0.200	1.750
SMD035-1812	0.35	0.75	16	100	0.8	8.00	0.100	0.320	1.500
SMD035-30-182	0.35	0.75	30	100	0.8	8.00	0.100	0.320	1.500
SMD050-1812	0.50	1.00	16	100	0.8	8.00	0.150	0.150	1.000
SMD050-30-1812	0.50	1.00	30	100	0.8	8.00	0.150	0.150	1.000
SMD075-1812	0.75	1.50	16	100	0.8	8.00	0.200	0.110	0.450
SMD075-24-1812	0.75	1.50	24	40	1.0	8.00	0.200	0.110	0.290
SMD075-33-1812	0.75	1.50	33	40	1.0	8.00	0.200	0.110	0.400
SMD110-1812	1.10	2.20	8	100	0.8	8.00	0.300	0.040	0.210
SMD110-16-1812	1.10	2.20	16	100	0.8	8.00	0.500	0.040	0.180
SMD110-24-1812	1.10	2.20	24	100	1.0	8.00	0.500	0.060	0.200
SMD110-33-1812	1.10	2.20	33	100	0.8	8.00	0.500	0.060	0.200
SMD125-1812	1.25	2.50	6	100	0.8	8.00	0.400	0.050	0.140
SMD125-16-1812	1.25	2.50	16	100	0.8	8.00	0.400	0.050	0.140
SMD150-1812	1.50	3.00	8	100	0.8	8.00	0.500	0.040	0.110
SMD150-12-1812	1.50	3.00	12	100	1.0	8.00	0.500	0.040	0.110
SMD150-24-1812	1.50	3.00	24	100	1.0	8.00	1.500	0.040	0.120
SMD160-1812	1.60	3.20	8	100	0.8	8.00	0.500	0.03	0.100
SMD160-16-1812	1.60	3.20	16	100	0.8	8.00	1.000	0.03	0.100
SMD200-1812	2.00	3.50	8	100	1.0	8.00	2.000	0.020	0.070
SMD200-16-1812	2.00	3.50	16	100	1.0	8.00	5.000	0.020	0.085
SMD260-1812	2.60	5.00	8	100	1.0	8.00	2.500	0.015	0.047
SMD260-16-1812	2.60	5.00	16	100	1.3	8.00	5.000	0.015	0.050
SMD300-1812	3.00	5.00	6	100	1.0	8.00	4.000	0.012	0.040

I<sub>H</sub>=Hold current-maximum current at which the device will not trip at 23°C still air.

I<sub>T</sub>=Trip current-minimum current at which the device will always trip at 23°C still air.

V<sub>MAX</sub>=Maximum voltage device can withstand without damage at it rated current.(I<sub>MAX</sub>)

I<sub>MAX</sub>= Maximum fault current device can withstand without damage at rated voltage (V<sub>MAX</sub>).

Pd=Typical power dissipated-type amount of power dissipated by the device when in the tripped state in 23°C still air environment.

R<sub>MIN</sub>=Minimum device resistance at 23°C prior to tripping.

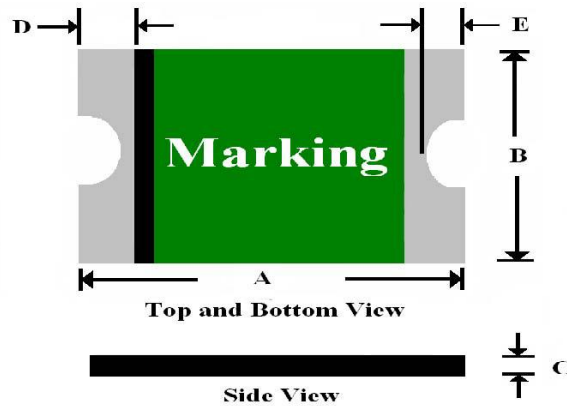
R<sub>1MAX</sub>=Maximum device resistance at 2°C measured 1 hour after tripping or reflow soldering of 260°C for 20 seconds.

Termination pad characteristics

Termination pad materials: Pure Tin

**NOTE : Specification subject to change without notice.**

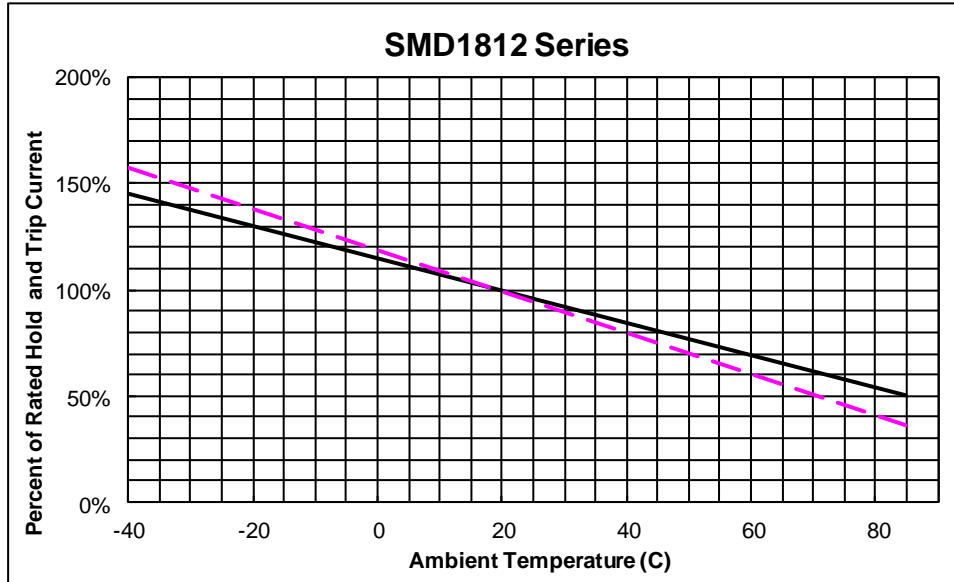
#### 4. SMD Product Dimensions (Millimeters)



Part Number	A		B		C		D		E	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
SMD010-1812	4.37	4.73	3.07	3.41	0.60	0.90	0.30	0.95	0.25	0.65
SMD014-1812	4.37	4.73	3.07	3.41	0.60	0.90	0.30	0.95	0.25	0.65
SMD020-1812	4.37	4.73	3.07	3.41	0.60	0.90	0.30	0.95	0.25	0.65
SMD020-60-1812	4.37	4.73	3.07	3.41	0.60	0.90	0.30	0.95	0.25	0.65
SMD030-1812	4.37	4.73	3.07	3.41	0.40	0.70	0.30	0.95	0.25	0.65
SMD035-1812	4.37	4.73	3.07	3.41	0.40	0.70	0.30	0.95	0.25	0.65
SMD035-30-182	4.37	4.73	3.07	3.41	0.40	0.70	0.30	0.95	0.25	0.65
SMD050-1812	4.37	4.73	3.07	3.41	0.35	0.65	0.30	0.95	0.25	0.65
SMD050-30-1812	4.37	4.73	3.07	3.41	0.45	0.75	0.30	0.95	0.25	0.65
SMD075-1812	4.37	4.73	3.07	3.41	0.35	0.65	0.30	0.95	0.25	0.65
SMD075-24-1812	4.37	4.73	3.07	3.41	0.80	1.55	0.25	0.95	0.25	0.65
SMD075-33-1812	4.37	4.73	3.07	3.41	0.80	1.55	0.25	0.95	0.25	0.65
SMD110-1812	4.37	4.73	3.07	3.41	0.25	0.55	0.30	0.95	0.25	0.65
SMD110-16-1812	4.37	4.73	3.07	3.41	0.25	0.90	0.30	0.95	0.25	0.65
SMD110-24-1812	4.37	4.73	3.07	3.41	0.80	1.30	0.25	0.95	0.25	0.65
SMD110-33-1812	4.37	4.73	3.07	3.41	0.80	1.30	0.25	0.95	0.25	0.65
SMD125-1812	4.37	4.73	3.07	3.41	0.25	0.55	0.30	0.95	0.25	0.65
SMD125-16-1812	4.37	4.73	3.07	3.41	0.50	1.00	0.30	0.95	0.25	0.65
SMD150-1812	4.37	4.73	3.07	3.41	0.25	0.55	0.30	0.95	0.25	0.65
SMD150-12-1812	4.37	4.73	3.07	3.41	0.60	1.10	0.25	0.95	0.25	0.65
SMD150-24-1812	4.37	4.73	3.07	3.41	0.60	1.55	0.25	0.95	0.25	0.65
SMD160-1812	4.37	4.73	3.07	3.41	0.25	0.90	0.30	0.95	0.25	0.65
SMD160-16-1812	4.37	4.73	3.07	3.41	0.60	1.35	0.25	0.95	0.25	0.65
SMD200-1812	4.37	4.73	3.07	3.41	0.55	1.20	0.25	0.95	0.25	0.65
SMD200-16-1812	4.37	4.73	3.07	3.41	0.60	1.55	0.25	0.95	0.25	0.65
SMD260-1812	4.37	4.73	3.07	3.41	0.55	1.20	0.25	0.95	0.25	0.65
SMD260-16-1812	4.37	4.73	3.07	3.41	0.80	1.55	0.25	0.95	0.25	0.65
SMD300-1812	4.37	4.73	3.07	3.41	0.80	1.55	0.25	0.95	0.25	0.65

NOTE : Specification subject to change without notice.

## 5. Thermal Derating Curve

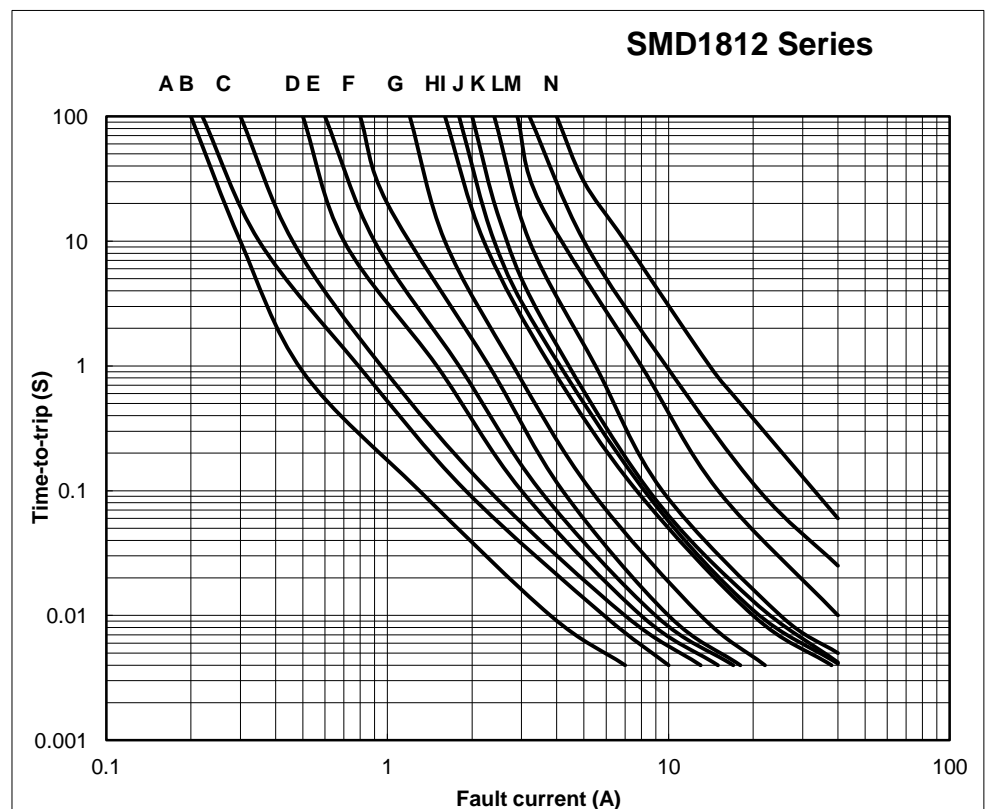


**A=SMD075~300-1812**

**B=SMD010~050-1812**

## 6. Typical Time-To-Trip at 23°C

- A = SMD010
- B = SMD014
- C = SMD020 / 020-60
- D = SMD030
- E = SMD035 / 035-30
- F = SMD050 / 050-30
- G = SMD075 / 075-24 / 075-33
- H = SMD110 / 110-16/ 110-24 / 110-33
- I = SMD125 / 125-16
- J = SMD150 / 150-12 / 150-24
- K = SMD160 / 160-16
- L = SMD200 / 200-16
- M = SMD260 / 260-16
- N = SMD300



**NOTE : Specification subject to change without notice.**

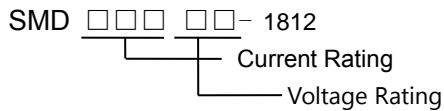
## 7. Material Specification

Terminal pad material: Pure Tin

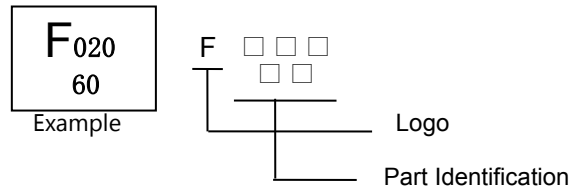
Soldering characteristics: Meets EIA specification RS 186-9E, ANSI/J-std-002 Category 3

## 8. Part Numbering and Marking System

### Part Numbering System



### Part Marking System



**Warning:** -Operation beyond the specified maximum ratings or improper use may result in damage and possible electrical arcing and/or flame.

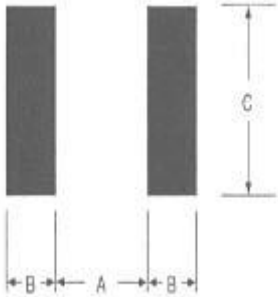


-PPTC device are intended for occasional overcurrent protection. Application for repeated overcurrent condition and/or prolonged trip are not anticipated.

-Avoid contact of PPTC device with chemical solvent. Prolonged contact will damage the device performance.

## 9. Pad Layouts、 Solder Reflow and Rework Recommendations

The dimension in the table below provide the recommended pad layout for each SMD1812 device



Pad dimensions (millimeters)			
Device	A Nominal	B Nominal	C Nominal
All SMD1812 series	3.45	1.78	3.50

Profile Feature	Pb-Free Assembly
Average Ramp-Up Rate (T <sub>smax</sub> to T <sub>p</sub> )	3°C/second max.
<b>Preheat :</b>	
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> )	60-180 seconds
<b>Time maintained above:</b>	
Temperature(T <sub>L</sub> )	217°C
Time (t <sub>L</sub> )	60-150 seconds
<b>Peak/Classification Temperature(T<sub>p</sub>) :</b>	260°C
<b>Time within 5°C of actual Peak :</b>	
Temperature (t <sub>p</sub> )	20-40 seconds
<b>Ramp-Down Rate :</b>	6°C/second max.
<b>Time 25°C to Peak Temperature :</b>	8 minutes max.

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

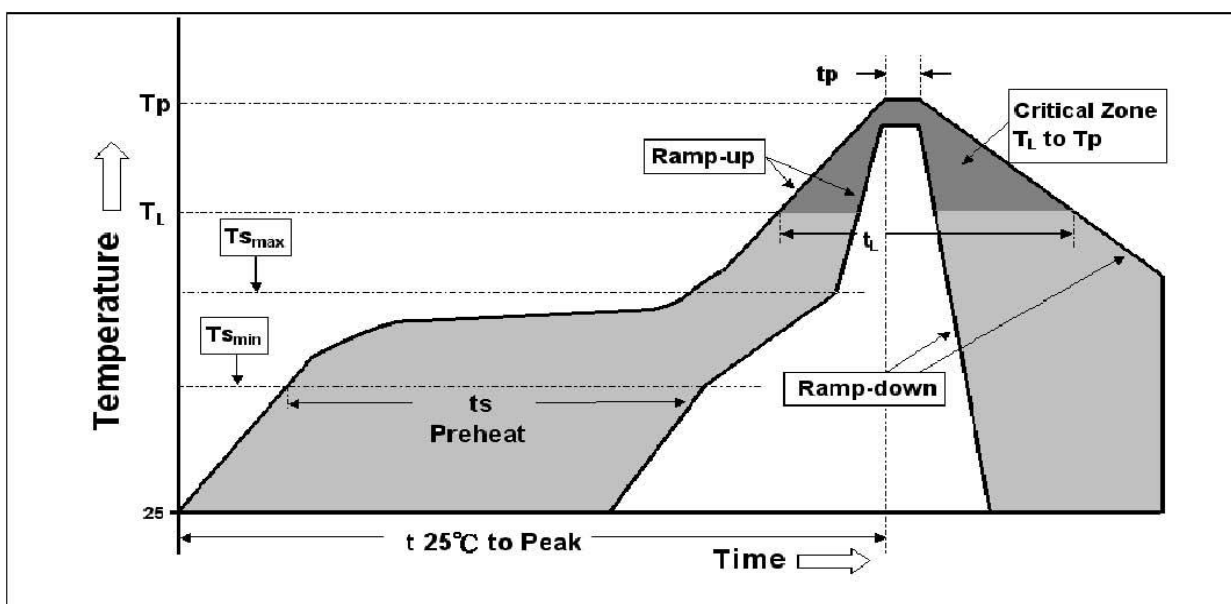
### Solder reflow

- ※ Due to "Lead Free" nature, Temperature and Dwelling time for the soldering zone is higher than those for Regular. This may cause damage to other components.
1. Recommended max past thickness > 0.25mm.
  2. Devices can be cleaned using standard methods and aqueous solvent.
  3. Rework use standard industry practices.
  4. Storage Environment : < 30°C/ 60%RH

### Caution:

1. If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.
2. Devices are not designed to be wave soldered to the bottom side of the board.

### Reflow Profile



NOTE : Specification subject to change without notice.