

## ***PolySwitch Resettable Devices***

### ***SMD1812 Series***

Surface-Mount Devices

Rev Letter: C

Rev Date: 2012-4-05

## **Feature**

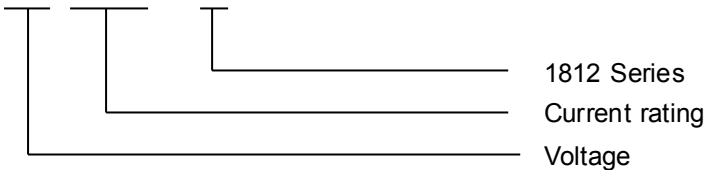
- Resettable overcurrent protection
- ROHS compliant
- Very small size of 1812
- Current rating from 0.10 to 2.60A
- Fast time-to-trip
- Small footprint
- Low resistance

## **Application**

- Computer
- Battery
- Mobile phones
- Industrial controls
- Automotive
- Portable electronics
- Multimedia
- Game machines
- Telephony and broadband

## **Part Numbering**

KT x x--x x x SMD



## **Typical Electrical Characteristics for SMD1812 Series at 25°C**

### ***Size 4532mm/1812mils***

| Part number  | Hold Current & Trip Current (Amps) |      | Maximum Voltage (V) | Maximum Current (A) | Maximum Time-to-Trip |      | Minimum Resistance (Ohms) | One Hour Post Reflow Resistance (Ohms) | Tripped State Power Dissipation (Watts) |
|--------------|------------------------------------|------|---------------------|---------------------|----------------------|------|---------------------------|--|---|
|              | Hold                               | Trip |                     |                     | (A)                  | (S)  |                           |  |   |
| KT60-0140SMD | 0.14                               | 0.34 | 60                  | 10                  | 1.5                  | 0.15 | 1.500                     | 6.000                                  | 0.80                                    |
| KT30-0100SMD | 0.10                               | 0.20 | 30                  | 40                  | 0.5                  | 1.50 | 1.600                     | 15.000                                 | 0.80                                    |
| KT30-0200SMD | 0.20                               | 0.40 | 30                  | 40                  | 8.0                  | 0.02 | 0.800                     | 5.000                                  | 0.80                                    |
| KT30-0350SMD | 0.35                               | 0.70 | 30                  | 40                  | 8.0                  | 0.15 | 0.400                     | 1.700                                  | 0.80                                    |
| KT15-0500SMD | 0.50                               | 1.00 | 15                  | 40                  | 8.0                  | 0.15 | 0.150                     | 1.000                                  | 0.80                                    |
| KT30-0500SMD | 0.50                               | 1.00 | 30                  | 40                  | 8.0                  | 0.15 | 0.150                     | 1.000                                  | 0.80                                    |
| KT13-0750SMD | 0.75                               | 1.50 | 13.2                | 40                  | 8.0                  | 0.20 | 0.100                     | 0.450                                  | 0.80                                    |

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|--------------|------|------|----|----|-----|------|-------|-------|------|
| KT24-0750SMD | 0.75 | 1.50 | 24 | 40 | 8.0 | 0.20 | 0.100 | 0.450 | 0.80 |
| KT33-0750SMD | 0.75 | 1.50 | 33 | 40 | 8.0 | 0.20 | 0.100 | 0.400 | 0.80 |
| KT8-1100SMD  | 1.10 | 2.20 | 8  | 40 | 8.0 | 0.30 | 0.060 | 0.210 | 0.80 |
| KT16-1100SMD | 1.10 | 2.20 | 16 | 40 | 8.0 | 0.30 | 0.060 | 0.210 | 0.80 |
| KT24-1100SMD | 1.10 | 2.20 | 24 | 40 | 8.0 | 0.50 | 0.060 | 0.210 | 0.80 |
| KT33-1100SMD | 1.10 | 2.20 | 33 | 20 | 8.0 | 0.50 | 0.060 | 0.210 | 1.00 |
| KT6-1250SMD  | 1.25 | 2.50 | 6  | 40 | 8.0 | 0.40 | 0.050 | 0.140 | 1.00 |
| KT16-1250SMD | 1.25 | 2.50 | 16 | 40 | 8.0 | 0.40 | 0.050 | 0.140 | 1.00 |
| KT12-1500SMD | 1.50 | 3.00 | 12 | 40 | 8.0 | 0.50 | 0.040 | 0.110 | 1.00 |
| KT24-1500SMD | 1.50 | 3.00 | 24 | 40 | 8.0 | 1.50 | 0.040 | 0.110 | 1.00 |
| KT8-1600SMD  | 1.60 | 3.20 | 8  | 40 | 8.0 | 1.00 | 0.030 | 0.100 | 1.00 |
| KT24-1600SMD | 1.60 | 3.20 | 24 | 40 | 8.0 | 1.00 | 0.030 | 0.100 | 1.00 |
| KT6-2000SMD  | 2.00 | 4.00 | 6  | 40 | 8.0 | 2.00 | 0.020 | 0.070 | 1.00 |
| KT8-2000SMD  | 2.00 | 4.00 | 8  | 40 | 8.0 | 2.00 | 0.020 | 0.070 | 1.00 |
| KT12-2000SMD | 2.00 | 4.00 | 12 | 40 | 8.0 | 2.00 | 0.020 | 0.070 | 1.20 |
| KT8-2600SMD  | 2.60 | 5.00 | 8  | 40 | 8.0 | 2.50 | 0.015 | 0.047 | 1.00 |
| KT12-2600SMD | 2.60 | 5.00 | 12 | 40 | 8.0 | 2.50 | 0.015 | 0.047 | 1.20 |

### **Thermal Derating For SMD1812 series [Hold Current (A) at Ambient Temperature(°C)]**

***Size 4532mm/1812mils***

| Part number  | Maximum Ambient Temperature |       |      |      |      |      |      |      |      |      |
|--------------|-----------------------------|-------|------|------|------|------|------|------|------|------|
|              | -40°C                       | -20°C | 0°C  | 20°C | 25°C | 40°C | 50°C | 60°C | 70°C | 85°C |
| KT60-0140SMD | 0.23                        | 0.20  | 0.17 | 0.15 | 0.14 | 0.11 | 0.10 | 0.09 | 0.07 | 0.05 |
| KT30-0100SMD | 0.17                        | 0.15  | 0.13 | 0.11 | 0.10 | 0.09 | 0.08 | 0.07 | 0.06 | 0.04 |
| KT30-0200SMD | 0.30                        | 0.27  | 0.23 | 0.20 | 0.20 | 0.17 | 0.15 | 0.13 | 0.12 | 0.09 |
| KT30-0350SMD | 0.50                        | 0.45  | 0.40 | 0.38 | 0.35 | 0.30 | 0.26 | 0.24 | 0.20 | 0.16 |
| KT15-0500SMD | 0.59                        | 0.57  | 0.55 | 0.52 | 0.50 | 0.45 | 0.43 | 0.35 | 0.30 | 0.23 |
| KT30-0500SMD | 0.59                        | 0.57  | 0.55 | 0.52 | 0.50 | 0.45 | 0.43 | 0.35 | 0.30 | 0.23 |
| KT13-0750SMD | 1.10                        | 0.99  | 0.87 | 0.77 | 0.75 | 0.63 | 0.57 | 0.49 | 0.45 | 0.35 |
| KT24-0750SMD | 1.10                        | 0.99  | 0.87 | 0.77 | 0.75 | 0.63 | 0.57 | 0.49 | 0.45 | 0.35 |
| KT33-0750SMD | 1.10                        | 0.99  | 0.87 | 0.77 | 0.75 | 0.63 | 0.57 | 0.49 | 0.45 | 0.35 |
| KT8-1100SMD  | 1.60                        | 1.45  | 1.28 | 1.12 | 1.10 | 0.92 | 0.83 | 0.71 | 0.66 | 0.52 |

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|--------------|------|------|------|------|------|------|------|------|------|------|
| KT16-1100SMD | 1.60 | 1.45 | 1.28 | 1.12 | 1.10 | 0.92 | 0.83 | 0.71 | 0.66 | 0.52 |
| KT24-1100SMD | 1.60 | 1.45 | 1.28 | 1.12 | 1.10 | 0.92 | 0.83 | 0.71 | 0.66 | 0.52 |
| KT33-1100SMD | 1.60 | 1.45 | 1.28 | 1.12 | 1.10 | 0.92 | 0.83 | 0.71 | 0.66 | 0.52 |
| KT6-1250SMD  | 2.00 | 1.69 | 1.47 | 1.27 | 1.25 | 1.03 | 0.92 | 0.90 | 0.69 | 0.53 |
| KT16-1250SMD | 2.00 | 1.69 | 1.47 | 1.27 | 1.25 | 1.03 | 0.92 | 0.90 | 0.69 | 0.53 |
| KT12-1500SMD | 2.30 | 2.05 | 1.77 | 1.52 | 1.50 | 1.23 | 1.09 | 0.95 | 0.82 | 0.61 |
| KT24-1500SMD | 2.30 | 2.05 | 1.77 | 1.52 | 1.50 | 1.23 | 1.09 | 0.95 | 0.82 | 0.61 |
| KT8-1600SMD  | 2.50 | 2.19 | 1.89 | 1.62 | 1.60 | 1.31 | 1.16 | 1.10 | 0.95 | 0.71 |
| KT24-1600SMD | 2.50 | 2.19 | 1.89 | 1.62 | 1.60 | 1.31 | 1.16 | 1.10 | 0.95 | 0.71 |
| KT6-2000SMD  | 2.60 | 2.44 | 2.22 | 2.02 | 2.00 | 1.78 | 1.67 | 1.50 | 1.45 | 1.29 |
| KT8-2000SMD  | 2.60 | 2.44 | 2.22 | 2.02 | 2.00 | 1.78 | 1.67 | 1.50 | 1.45 | 1.29 |
| KT12-2000SMD | 2.60 | 2.44 | 2.22 | 2.02 | 2.00 | 1.78 | 1.67 | 1.50 | 1.45 | 1.29 |
| KT8-2600SMD  | 3.40 | 3.16 | 2.8  | 2.62 | 2.60 | 2.32 | 2.18 | 2.00 | 1.90 | 1.69 |
| KT12-2600SMD | 3.40 | 3.16 | 2.8  | 2.62 | 2.60 | 2.32 | 2.18 | 2.00 | 1.90 | 1.69 |

## **Typical Product Dimensions in Millimeters(Inches)**

***Size*** 4532mm/1812 *mils*

| <b>Part number</b> | <b>A</b>    | <b>B</b>    | <b>C</b>    | <b>D</b>    | <b>E</b>    | <b>Figures for<br/>Dimension</b> |
|--------------------|-------------|-------------|-------------|-------------|-------------|----------------------------------|
|                    | <b>Max.</b> | <b>Max.</b> | <b>Max.</b> | <b>Min.</b> | <b>Min.</b> |                                  |
| KT60-0140SMD       | 4.73(0.186) | 3.41(0.134) | 0.90(0.035) | 0.25(0.010) | 0.20(0.008) | 1                                |
| KT30-0100SMD       | 4.73(0.186) | 3.41(0.134) | 0.90(0.035) | 0.25(0.010) | 0.20(0.008) | 1                                |
| KT30-0200SMD       | 4.73(0.186) | 3.41(0.134) | 0.90(0.035) | 0.25(0.010) | 0.20(0.008) | 1                                |
| KT30-0350SMD       | 4.73(0.186) | 3.41(0.134) | 0.90(0.035) | 0.25(0.010) | 0.20(0.008) | 1                                |
| KT15-0500SMD       | 4.73(0.186) | 3.41(0.134) | 0.90(0.035) | 0.25(0.010) | 0.20(0.008) | 1                                |
| KT30-0500SMD       | 4.73(0.186) | 3.41(0.134) | 1.20(0.047) | 0.25(0.010) | 0.20(0.008) | 1                                |
| KT13-0750SMD       | 4.73(0.186) | 3.41(0.134) | 0.80(0.032) | 0.25(0.010) | 0.20(0.008) | 1                                |
| KT24-0750SMD       | 4.73(0.186) | 3.41(0.134) | 1.40(0.055) | 0.25(0.010) | 0.20(0.008) | 1                                |
| KT33-0750SMD       | 4.73(0.186) | 3.41(0.134) | 1.40(0.055) | 0.25(0.010) | 0.20(0.008) | 1                                |
| KT8-1100SMD        | 4.73(0.186) | 3.41(0.134) | 1.00(0.039) | 0.25(0.010) | 0.20(0.008) | 1                                |
| KT16-1100SMD       | 4.73(0.186) | 3.41(0.134) | 1.10(0.043) | 0.25(0.010) | 0.20(0.008) | 1                                |
| KT24-1100SMD       | 4.73(0.186) | 3.41(0.134) | 1.40(0.055) | 0.25(0.010) | 0.20(0.008) | 1                                |
| KT33-1100SMD       | 4.73(0.186) | 3.41(0.134) | 1.40(0.055) | 0.25(0.010) | 0.20(0.008) | 1                                |
| KT6-1250SMD        | 4.73(0.186) | 3.41(0.134) | 1.10(0.043) | 0.25(0.010) | 0.20(0.008) | 1                                |

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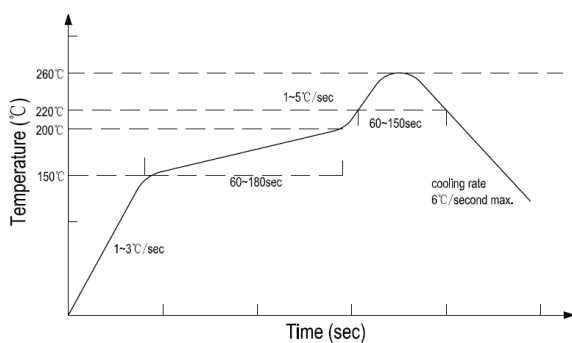
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|              |             |             |             |             |             |   |
|--------------|-------------|-------------|-------------|-------------|-------------|---|
| KT16-1250SMD | 4.73(0.186) | 3.41(0.134) | 1.10(0.043) | 0.25(0.010) | 0.20(0.008) | 1 |
| KT12-1500SMD | 4.73(0.186) | 3.41(0.134) | 1.10(0.043) | 0.25(0.010) | 0.20(0.008) | 1 |
| KT24-1500SMD | 4.73(0.186) | 3.41(0.134) | 1.40(0.055) | 0.25(0.010) | 0.20(0.008) | 1 |
| KT8-1600SMD  | 4.73(0.186) | 3.41(0.134) | 1.10(0.043) | 0.25(0.010) | 0.20(0.008) | 1 |
| KT24-1600SMD | 4.73(0.186) | 3.41(0.134) | 1.40(0.055) | 0.25(0.010) | 0.20(0.008) | 1 |
| KT6-2000SMD  | 4.73(0.186) | 3.41(0.134) | 1.00(0.039) | 0.25(0.010) | 0.20(0.008) | 1 |
| KT8-2000SMD  | 4.73(0.186) | 3.41(0.134) | 1.00(0.039) | 0.25(0.010) | 0.20(0.008) | 1 |
| KT12-2000SMD | 4.73(0.186) | 3.41(0.134) | 1.40(0.055) | 0.25(0.010) | 0.20(0.008) | 1 |
| KT8-2600SMD  | 4.73(0.186) | 3.41(0.134) | 1.40(0.055) | 0.25(0.010) | 0.20(0.008) | 1 |
| KT12-2600SMD | 4.73(0.186) | 3.41(0.134) | 1.40(0.055) | 0.25(0.010) | 0.20(0.008) | 1 |

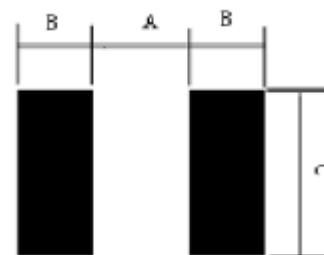


**Figure 1**

## Solder Reflow Recommendation



Reflow -curve



Footprint(mm)

\* Recommended reflow methods: IR, hot air oven, Nitrogen oven.

\* Devices can be cleaned using standard industry methods and solvents.

### Note:

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

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**Caution:** Operation beyond the rated voltage or current may result in rupture electrical arcing or flame.

## Environmental Specifications

- Recommended storage conditions: 40°C max, 70% R.H. max
- Thermal Shock: -40°C to 85°C, 30 min cycle, 20 cycles.
- Passive aging: 85°C, 1000 hours
- Vibration: per MIL-STD-883C
- Moisture Resistance: 85% RH, 85°C, 1000hrs
- Solder leach resistance and terminal adhesion: Per EIA-576 test

## Packaging Information

**Size** 4532mm/1812 mils

| Part number  | Tape &<br>Reel<br>Quantity | Tape<br>spc<br>code | Recommended Pad Layout Figures[mm(In.)] |                   |                   |
|--------------|----------------------------|---------------------|---|-------------------|-------------------|
|              |                            |                     | Dimension A(Nom.)                       | Dimension B(Nom.) | Dimension C(Nom.) |
| KT60-0140SMD | 2000                       | 1812                | 3.10(0.122)                             | 1.68(0.066)       | 2.95(0.114)       |
| KT30-0100SMD | 2000                       | 1812                | 3.10(0.122)                             | 1.68(0.066)       | 2.95(0.114)       |
| KT30-0200SMD | 2000                       | 1812                | 3.10(0.122)                             | 1.68(0.066)       | 2.95(0.114)       |
| KT30-0350SMD | 2000                       | 1812                | 3.10(0.122)                             | 1.68(0.066)       | 2.95(0.114)       |
| KT15-0500SMD | 2000                       | 1812                | 3.10(0.122)                             | 1.68(0.066)       | 2.95(0.114)       |
| KT30-0500SMD | 2000                       | 1812                | 3.10(0.122)                             | 1.68(0.066)       | 2.95(0.114)       |
| KT13-0750SMD | 2000                       | 1812                | 3.10(0.122)                             | 1.68(0.066)       | 2.95(0.114)       |
| KT24-0750SMD | 2000                       | 1812                | 3.10(0.122)                             | 1.68(0.066)       | 2.95(0.114)       |
| KT33-0750SMD | 2000                       | 1812                | 3.10(0.122)                             | 1.68(0.066)       | 2.95(0.114)       |
| KT8-1100SMD  | 1500                       | 1812                | 3.10(0.122)                             | 1.68(0.066)       | 2.95(0.114)       |
| KT16-1100SMD | 1500                       | 1812                | 3.10(0.122)                             | 1.68(0.066)       | 2.95(0.114)       |
| KT24-1100SMD | 1500                       | 1812                | 3.10(0.122)                             | 1.68(0.066)       | 2.95(0.114)       |
| KT33-1100SMD | 1500                       | 1812                | 3.10(0.122)                             | 1.68(0.066)       | 2.95(0.114)       |
| KT6-1250SMD  | 1500                       | 1812                | 3.10(0.122)                             | 1.68(0.066)       | 2.95(0.114)       |
| KT16-1250SMD | 1500                       | 1812                | 3.10(0.122)                             | 1.68(0.066)       | 2.95(0.114)       |
| KT12-1500SMD | 2000                       | 1812                | 3.10(0.122)                             | 1.68(0.066)       | 2.95(0.114)       |
| KT24-1500SMD | 1500                       | 1812                | 3.10(0.122)                             | 1.68(0.066)       | 2.95(0.114)       |
| KT8-1600SMD  | 2000                       | 1812                | 3.10(0.122)                             | 1.68(0.066)       | 2.95(0.114)       |
| KT24-1600SMD | 1500                       | 1812                | 3.10(0.122)                             | 1.68(0.066)       | 2.95(0.114)       |
| KT6-2000SMD  | 2000                       | 1812                | 3.10(0.122)                             | 1.68(0.066)       | 2.95(0.114)       |
| KT8-2000SMD  | 2000                       | 1812                | 3.10(0.122)                             | 1.68(0.066)       | 2.95(0.114)       |

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### ***SMD1812 Series***

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|              |      |      |             |             |             |
|--------------|------|------|-------------|-------------|-------------|
| KT12-2000SMD | 1500 | 1812 | 3.10(0.122) | 1.68(0.066) | 2.95(0.114) |
| KT8-2600SMD  | 1500 | 1812 | 3.10(0.122) | 1.68(0.066) | 2.95(0.114) |
| KT12-2600SMD | 1500 | 1812 | 3.10(0.122) | 1.68(0.066) | 2.95(0.114) |

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#### **WARNING:**

- Operation beyond the maximum ratings or improper use may result in device damage and possible electrical arcing and flame.
- The devices are intended for protection against occasional overcurrent or overtemperature fault conditions and should not be used when repeated fault conditions or prolonged trip events are anticipated.
- Contamination of the PPTC material with certain silicon based oils or some aggressive solvents can adversely impact the performance of the devices.
- Device performance can be impacted negatively if devices are handled in a manner inconsistent with recommended electronic, thermal and mechanical procedures for electronic components.
- Operation in circuit with a large inductance can generate a circuit voltage ( $L di/dt$ ) above the rated voltage of the PPTC device.