



# nSMD Series

## Features

- Surface Mount Devices
- Lead free device
- Size 3.2\*1.6 mm/0.12\*0.06 inch
- Surface Mount packaging for automated assembly

## Applications

- Almost anywhere there is a low voltage power supply, up to 60V and a load to be protected, including:
- Computer mother board, Modem, USB hub
  - PDAs & Charger, Analog & digital line card
  - Digital cameras, Disk drivers, CD-ROMs,

Alpha-Top (Sea&Land Alliance)

## Performance Specification

| Model         | Marking | V <sub>max</sub><br>(Vdc) | I <sub>max</sub><br>(A) | I <sub>hold</sub><br>@25°C<br>(A) | I <sub>trip</sub><br>@25°C<br>(A) | P <sub>d</sub><br>Max.<br>(W) | Maximum Time To Trip |               | Resistance               |                          | Agency Approval |     |
|---------------|---------|---------------------------|-------------------------|-----------------------------------|-----------------------------------|-------------------------------|----------------------|---------------|--------------------------|--------------------------|-----------------|-----|
|               |         |                           |                         |                                   |                                   |                               | Current<br>(A)       | Time<br>(Sec) | R <sub>lmin</sub><br>(Ω) | R <sub>lmax</sub><br>(Ω) | UL              | TUV |
| nSMD005       | αZ      | 60.0                      | 100                     | 0.05                              | 0.15                              | 0.4                           | 0.25                 | 1.50          | 3.600                    | 50.000                   |                 |     |
| nSMD010       | αN      | 60.0                      | 100                     | 0.10                              | 0.25                              | 0.4                           | 0.50                 | 1.00          | 1.600                    | 15.000                   |                 |     |
| nSMD012       | αN      | 60.0                      | 100                     | 0.12                              | 0.29                              | 0.4                           | 0.50                 | 1.00          | 1.600                    | 15.000                   |                 |     |
| nSMD020       | αA      | 24.0                      | 100                     | 0.20                              | 0.46                              | 0.6                           | 8.00                 | 0.08          | 0.350                    | 2.700                    |                 |     |
| nSMD025       | αA      | 16.0                      | 100                     | 0.25                              | 0.50                              | 0.6                           | 8.00                 | 0.08          | 0.350                    | 2.500                    | ✓               |     |
| nSMD035       | αB      | 6.0                       | 100                     | 0.35                              | 0.75                              | 0.6                           | 8.00                 | 0.10          | 0.250                    | 1.300                    | ✓               |     |
| nSMD050       | αF      | 6.0                       | 100                     | 0.50                              | 1.00                              | 0.6                           | 8.00                 | 0.10          | 0.150                    | 0.700                    | ✓               |     |
| nSMD050-13.2V | αF      | 13.2                      | 100                     | 0.50                              | 1.00                              | 0.6                           | 8.00                 | 0.10          | 0.150                    | 0.700                    | ✓               |     |
| nSMD075       | αG      | 6.0                       | 100                     | 0.75                              | 1.50                              | 0.6                           | 8.00                 | 0.20          | 0.090                    | 0.500                    | ✓               |     |
| nSMD100       | αH      | 6.0                       | 100                     | 1.00                              | 1.80                              | 0.6                           | 8.00                 | 0.30          | 0.055                    | 0.270                    | ✓               | ✓   |
| nSMD110       | αH      | 6.0                       | 100                     | 1.10                              | 2.20                              | 0.6                           | 8.00                 | 0.30          | 0.050                    | 0.250                    |                 |     |
| nSMD150       | αI      | 6.0                       | 100                     | 1.50                              | 3.00                              | 0.8                           | 8.00                 | 1.00          | 0.040                    | 0.130                    | ✓               |     |
| nSMD200       | αK      | 6.0                       | 100                     | 2.00                              | 3.50                              | 0.8                           | 8.00                 | 1.50          | 0.018                    | 0.080                    |                 |     |

**I<sub>hold</sub>** = Hold Current. Maximum current device will not trip in 25°C still air.

**I<sub>trip</sub>** = Trip Current. Minimum current at which the device will always trip in 25°C still air.

**V<sub>max</sub>** = Maximum operating voltage device can withstand without damage at 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>).

**P<sub>d</sub>** = Power dissipation when device is in the tripped state in 25°C still air environment at rated voltage.

**R<sub>lmin</sub>/max** = Minimum/Maximum device resistance prior to tripping at 25°C.

**R<sub>lmax</sub>** = Maximum device resistance is measured one hour post reflow.

**CAUTION** : Operation beyond the specified ratings may result in damage and possible arcing and flame.

## Environmental Specifications

| Test  | Conditions                 | Resistance change |
|---|----------------------------|-------------------|
| Passive aging   | +85°C, 1000 hrs.           | ±5% typical       |
| Humidity aging  | +85°C, 85% R.H., 168 hours | ±5% typical       |
| Thermal shock   | +85°C to -40°C, 20 times   | ±33% typical      |
| Resistance to solvent   | MIL-STD-202, Method 215    | No change         |
| Vibration   | MIL-STD-202, Method 201    | No change         |
| Ambient operating conditions :                                    | - 40 °C to 85 °C           |                   |
| Maximum surface temperature of the device in the tripped state is | 125 °C                     |                   |

## Agency Approvals :



E201504(Alpha-Top)/E319079(Sea&Land)



NO. R-50141892

## Regulation/Standard:



2002/95/EC



EN14582

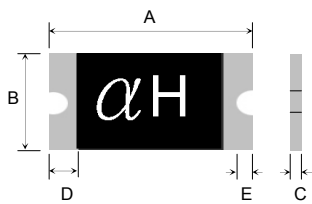
## I<sub>hold</sub> Versus Temperature

| Model         | Maximum ambient operating temperature (T <sub>mao</sub> ) vs. hold current (I <sub>hold</sub> ) |       |       |      |        |       |       |      |        |  |
|---------------|---|-------|-------|------|--------|-------|-------|------|--------|--|
|               | -40°C   | -20°C | 0°C   | 25°C | 40°C   | 50°C  | 60°C  | 70°C | 85°C   |  |
| nSMD005       | 0.074   | 0.066 | 0.058 | 0.05 | 0.0425 | 0.038 | 0.035 | 0.03 | 0.0275 |  |
| nSMD010       | 0.148   | 0.132 | 0.116 | 0.10 | 0.085  | 0.075 | 0.07  | 0.06 | 0.055  |  |
| nSMD012       | 0.18  | 0.16  | 0.14  | 0.12 | 0.10   | 0.09  | 0.08  | 0.07 | 0.07   |  |
| nSMD020       | 0.30  | 0.26  | 0.23  | 0.20 | 0.17   | 0.15  | 0.14  | 0.12 | 0.11   |  |
| nSMD025       | 0.37  | 0.33  | 0.29  | 0.25 | 0.22   | 0.20  | 0.17  | 0.15 | 0.12   |  |
| nSMD035       | 0.50  | 0.45  | 0.40  | 0.35 | 0.30   | 0.27  | 0.24  | 0.21 | 0.15   |  |
| nSMD050       | 0.71  | 0.64  | 0.57  | 0.50 | 0.42   | 0.39  | 0.35  | 0.31 | 0.25   |  |
| nSMD050-13.2V | 0.71  | 0.64  | 0.57  | 0.50 | 0.42   | 0.39  | 0.35  | 0.31 | 0.25   |  |
| nSMD075       | 1.14  | 1.01  | 0.88  | 0.75 | 0.65   | 0.59  | 0.54  | 0.49 | 0.41   |  |
| nSMD100       | 1.45  | 1.31  | 1.15  | 1.00 | 0.84   | 0.77  | 0.69  | 0.61 | 0.48   |  |
| nSMD110       | 1.60  | 1.45  | 1.30  | 1.10 | 0.95   | 0.80  | 0.72  | 0.66 | 0.55   |  |
| nSMD150       | 2.18  | 1.94  | 1.72  | 1.50 | 1.28   | 1.17  | 1.06  | 0.96 | 0.77   |  |
| nSMD200       | 2.88  | 2.63  | 2.34  | 2.00 | 1.74   | 1.58  | 1.42  | 1.17 | 0.93   |  |

**Construction And Dimension (Unit:mm)**

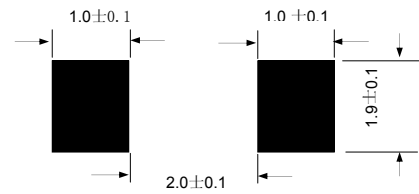
| Model         | A    |      | B    |      | C    |      | D    |      | E |
|---------------|------|------|------|------|------|------|------|------|---|
|               | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Min. |   |
| nSMD005       | 3.00 | 3.50 | 1.50 | 1.80 | 0.60 | 1.10 | 0.15 | 0.10 |   |
| nSMD010       | 3.00 | 3.50 | 1.50 | 1.80 | 0.60 | 1.10 | 0.15 | 0.10 |   |
| nSMD012       | 3.00 | 3.50 | 1.50 | 1.80 | 0.60 | 1.10 | 0.15 | 0.10 |   |
| nSMD020       | 3.00 | 3.50 | 1.50 | 1.80 | 0.40 | 0.90 | 0.15 | 0.10 |   |
| nSMD025       | 3.00 | 3.50 | 1.50 | 1.80 | 0.40 | 0.90 | 0.15 | 0.10 |   |
| nSMD035       | 3.00 | 3.50 | 1.50 | 1.80 | 0.40 | 0.90 | 0.15 | 0.10 |   |
| nSMD050       | 3.00 | 3.50 | 1.50 | 1.80 | 0.35 | 0.85 | 0.15 | 0.10 |   |
| nSMD050-13.2V | 3.00 | 3.50 | 1.50 | 1.80 | 0.35 | 0.85 | 0.15 | 0.10 |   |
| nSMD075       | 3.00 | 3.50 | 1.50 | 1.80 | 0.40 | 0.90 | 0.15 | 0.10 |   |
| nSMD100       | 3.00 | 3.50 | 1.50 | 1.80 | 0.40 | 0.80 | 0.15 | 0.10 |   |
| nSMD110       | 3.00 | 3.50 | 1.50 | 1.80 | 0.40 | 0.80 | 0.15 | 0.10 |   |
| nSMD150       | 3.00 | 3.50 | 1.50 | 1.80 | 0.50 | 1.20 | 0.15 | 0.10 |   |
| nSMD200       | 3.00 | 3.50 | 1.50 | 1.80 | 0.50 | 1.20 | 0.15 | 0.10 |   |

**Dimensions & Marking**



α = Trademark  
H = Part identification

**Recommended Pad Layout (mm)**



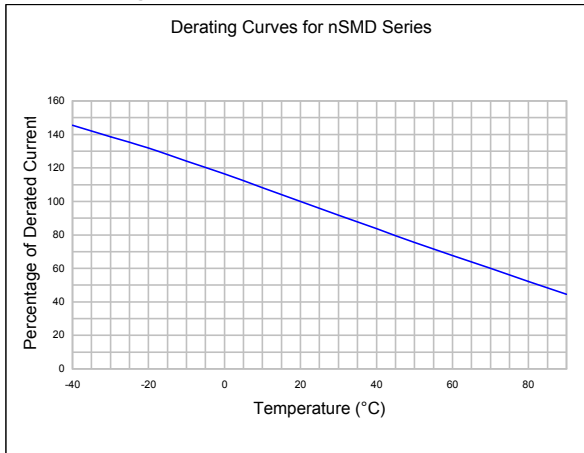
**Termination Pad Characteristics**

Terminal pad materials : Tin-plated Nickel-Copper  
Terminal pad solderability : Meets EIA specification RS186-9E and ANSI/J-STD-002 Category 3.

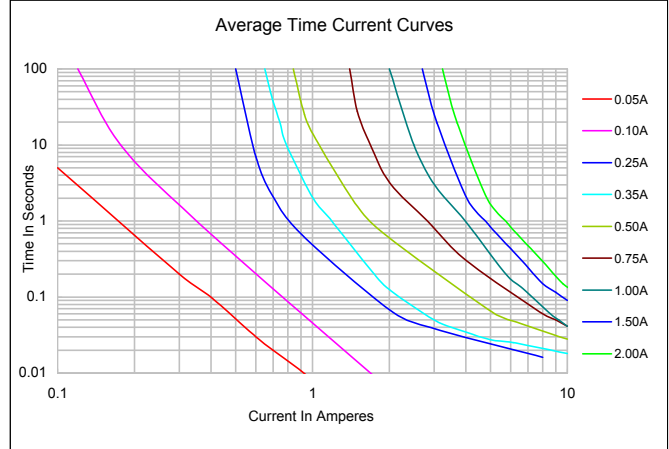
**Rework**

Use standard industry practices, the removal device must be replaced with a fresh one.

**Thermal Derating Curve**



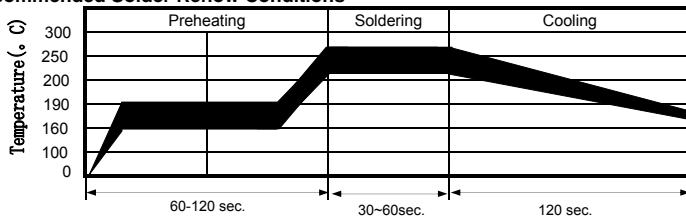
**Typical Time-To-Trip At 25°C**



**WARNING:**

- Use PPTC beyond the maximum ratings or improper use may result in device damage and possible electrical arcing and flame.
- PPTC are intended for protection against occasional over current or over temperature fault conditions and should not be used when repeated fault conditions or prolonged trip events are anticipated.
- Device performance can be impacted negatively if devices are handled in a manner inconsistent with recommended electronic, thermal, and mechanical procedures for electronic components.
- Use PPTC with a large inductance in circuit will generate a circuit voltage (L di/dt) above the rated voltage of the PPTC.
- Avoid impact PPTC device its thermal expansion like placed under pressure or installed in limited space.
- Contamination of the PPTC material with certain silicon based oils or some aggressive solvents can adversely impact the performance of the devices. PPTC SMD can be cleaned by standard methods.
- Requests that customers comply with our recommended solder pad layouts and recommended reflow profile. Improper board layouts or reflow profile could negatively impact solderability performance of our devices.

**Recommended Solder Reflow Conditions**

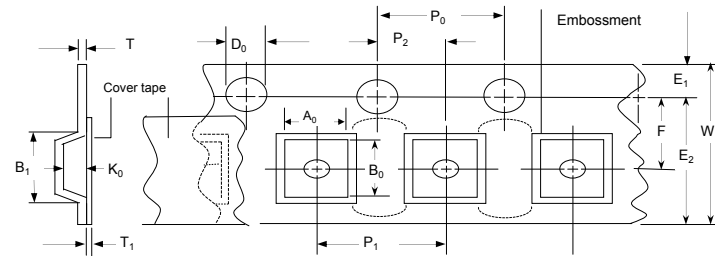


- Recommended reflow methods : IR, vapor phase oven, hot air oven.
  - Devices are not designed to be wave soldered to the bottom side of the board.
  - Recommended maximum paste thickness is 0.25 mm (0.010 inch).
  - Devices can be cleaned using standard method and solvents.
- Note : If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.

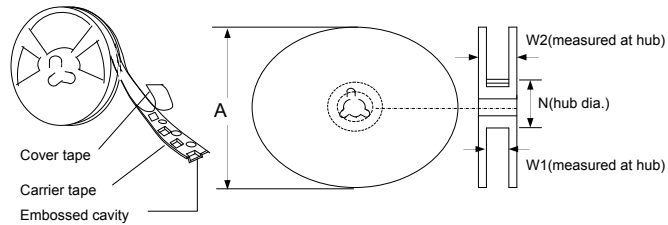
**Tape And Reel Specifications (mm)**

| Governing Specifications | EIA 481-1     |
|--------------------------|---------------|
| W                        | 8.15 ± 0.3    |
| P0                       | 4.0 ± 0.10    |
| P1                       | 4.0 ± 0.10    |
| P2                       | 2.0 ± 0.05    |
| A0                       | 1.95 ± 0.10   |
| B0                       | 3.45 ± 0.10   |
| B1max.                   | 4.35          |
| D0                       | 1.5 + 0.1, -0 |
| F                        | 3.5 ± 0.05    |
| E1                       | 1.75 ± 0.10   |
| E2min.                   | 6.25          |
| Tmax.                    | 0.6           |
| T1max.                   | 0.1           |
| K0                       | 1.04 ± 0.1    |
| Leader min.              | 390           |
| Trailer min.             | 160           |
| <b>Reel Dimensions</b>   |               |
| A max.                   | 178           |
| N min.                   | 60            |
| W1                       | 9 ± 0.5       |
| W2                       | 12.6 ± 0.5    |

**EIA Tape Component Dimensions**



**EIA Reel Dimensions**



**Storage And Handling**

- Storage conditions : 40°C max, 70% R.H.
- Devices may not meet specified performance if storage conditions are exceeded.

**Order Information**

| nSMD                       | 075     | Packaging                   |                |
|----------------------------|---------|-----------------------------|----------------|
| Product name               | Hold    | Tape & Reel Quantity        |                |
| Size 3216 mm / 1206 inch   | Current | 005,010,012,150,200         | 3,500 pcs/reel |
| SMD : surface mount device | 0.75A   | 020,025,035,050,075,100,110 | 5,000 pcs/reel |

Tape & reel packaging per EIA481-1

**Labeling Information**

**Sea & Land Electronic Corp.**

Model:      Part no.:      Spec.:      Lot no.:      Q'ty:

倉儲: 密封! 温度: 18~33°C/湿度: 30~60% A

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