



# SEA & LAND ELECTRONIC CORP.

[www.sealand-pptc.com](http://www.sealand-pptc.com)

## APPROVAL SHEET

MODEL NO.: mSMD020-60V

CUSTOMER:

CUSTOMER'S APPROVAL:

AUTHORIZED SIGNATURE/STAMP:

DATE

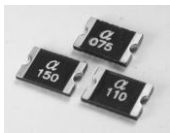
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Approved by: YC Lin  
DATE: 2015/1/19

SEA & LAND ELECTRONIC CORP.



## mSMD020-60V

### Features

- Surface Mount Devices
- Lead free device
- Size 4.5\*3.2 mm/0.18\*0.12 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,

### Performance Specification

| Model       | 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>Typ.<br>(W) | Maximum Time To Trip |               | Resistance                |                           | Agency Approval |     |
|-------------|---------------------------|-------------------------|-----------------------------------|-----------------------------------|-------------------------------|----------------------|---------------|---------------------------|---------------------------|-----------------|-----|
|             |                           |                         |                                   |                                   |                               | Current<br>(A)       | Time<br>(Sec) | R <sub>i_min</sub><br>(Ω) | R <sub>1_max</sub><br>(Ω) | UL              | TUV |
| mSMD020-60V | 60.0                      | 100                     | 0.20                              | 0.40                              | 0.8                           | 8.0                  | 0.02          | 0.350                     | 5.000                     |                 |     |

**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>imin/max</sub>** = Minimum/Maximum device resistance prior to tripping at 25°C.  
**R<sub>1\_max</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 :

UL pending

Regulation/Standard:



2002/95/EC



EN14582

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

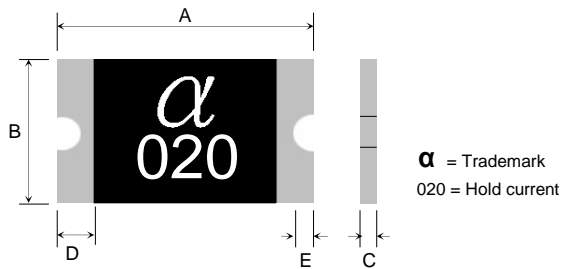
| Model       | Maximum ambient operating temperature (T <sub>mao</sub> ) vs. hold current (I <sub>hold</sub> ) |       |      |      |      |      |      |      |      |
|-------------|---|-------|------|------|------|------|------|------|------|
|             | -40°C   | -20°C | 0°C  | 25°C | 40°C | 50°C | 60°C | 70°C | 85°C |
| mSMD020-60V | 0.29  | 0.26  | 0.23 | 0.20 | 0.17 | 0.15 | 0.14 | 0.12 | 0.10 |

# mSMD020-60V

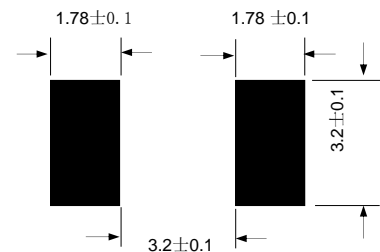
## Construction And Dimension (Unit:mm)

| Model       | A    |      | B    |      | C    |      | D    |      | E    |      |
|-------------|------|------|------|------|------|------|------|------|------|------|
|             | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. |
| mSMD020-60V | 4.37 | 4.73 | 3.07 | 3.41 | 0.50 | 1.30 | 0.30 |      | 0.25 |      |

## Dimensions & Marking



## Recommended Pad Layout (mm)



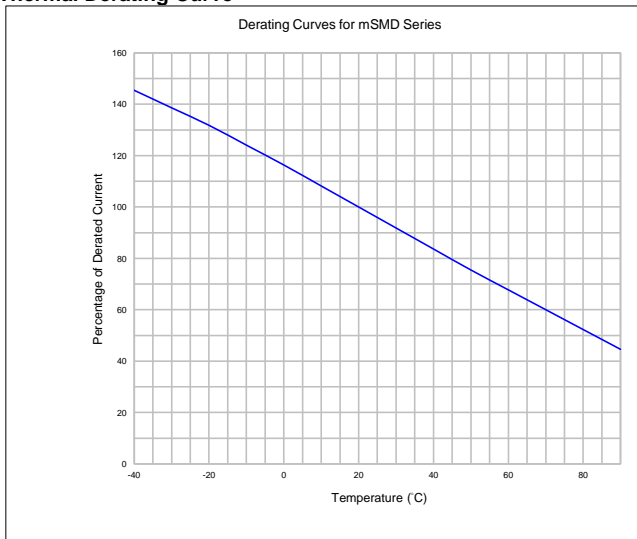
## Termination Pad Characteristics

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

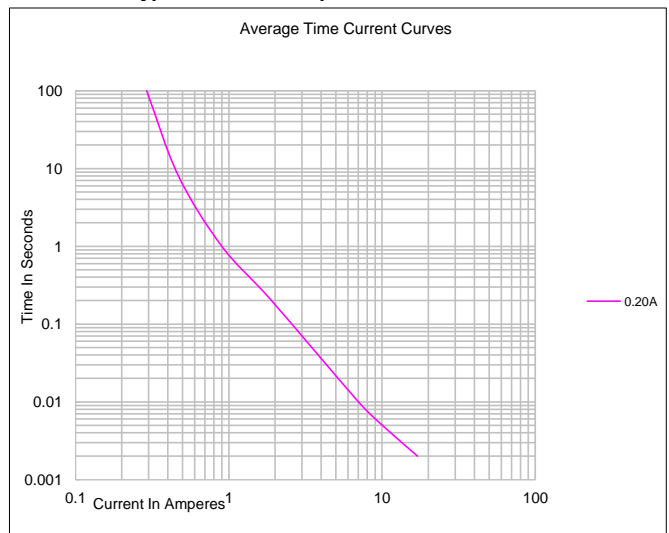
## Rework

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

# mSMD020-60V

## Recommended Solder Reflow Conditions

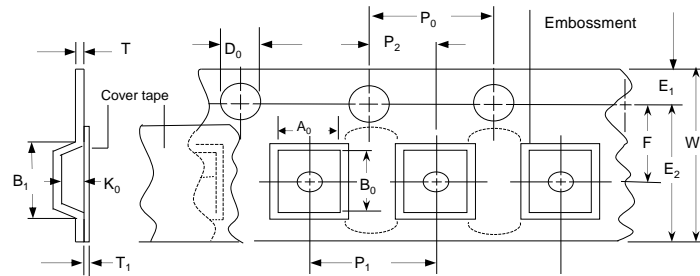


- Recommended reflow methods : IR, vapor phase oven, hot air oven.
  - Devices are not designed to be wave soldered to the bottom side of the board.
  - Recommended maximum paste thickness is 0.25 mm (0.010 inch).
  - Devices can be cleaned using standard method and solvents.
- Note : If reflow temperatures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

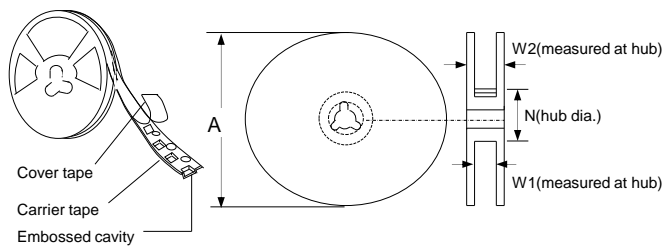
## Tape And Reel Specifications (mm)

| Governing Specifications | EIA 481-1        |
|--------------------------|------------------|
| W                        | 12 ± 0.3         |
| P0                       | 4.0 ± 0.10       |
| P1                       | 8.0 ± 0.10       |
| P2                       | 2.0 ± 0.05       |
| A0                       | 3.5 ± 0.23       |
| B0                       | 5.1 ± 0.15       |
| B1max.                   | 5.9              |
| D0                       | 1.5 + 0.1, -0    |
| F                        | 5.5 ± 0.05       |
| E1                       | 1.75 ± 0.10      |
| E2min.                   | 10.25            |
| Tmax.                    | 0.6              |
| T1max.                   | 0.1              |
| K0                       | 0.9 ± 0.15       |
| Leader min.              | 390              |
| Trailer min.             | 160              |
| <b>Reel Dimensions</b>   |                  |
| A max.                   | 178              |
| N min.                   | 60               |
| W1                       | 12.4 + 2.0, -0.0 |
| W2max.                   | 18.4             |

## 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

| mSMD                       | 020     | -60V    | Packaging | Tape & Reel Quantity |
|----------------------------|---------|---------|-----------|----------------------|
| Product name               | Hold    | Max     |           |                      |
| Size 4532mm/1812 inch      | Current | Voltage |           |                      |
| SMD : surface mount device | 0.20A   |         |           | 1,500 pcs/reel       |

Tape & reel packaging per EIA481-1

## Labeling Information

**Sea & Land Electronic Corp.**

**HF**   **Pb**   **RoHS**

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

倉儲: 密封! 溫度: 18~33°C/濕度: 30~60% A