



SEA & LAND ELECTRONIC CORP.

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

ALPHA-TOP TECHNOLOGY CORP.

[www.alpha-top.cn](http://www.alpha-top.cn)

## APPROVAL SHEET

MODEL NO.: mSMD020-90V

CUSTOMER:

CUSTOMER'S APPROVAL:

AUTHORIZED SIGNATURE/STAMP:

DATE

### MANUFACTURER:

HEAD OFFICE:

13F.,No.120-10,Sec.3,Zhongshan Rd.,Zhonghe Dist.,New Taipei City 23544,Taiwan  
Tel: 886-2-8221-2567  
Fax:882-2-2225-7268  
E-mail:service@chipfast.com.tw

China Branch:

Factory Building B)Shuangpeng,Weibu Village, Qiuchang Town,  
Huiyang District, Huizhou City, Guangdong Province, P.R.C.)  
Tel: 86-752-3562001  
Fax:86-752-3558696  
E-mail:service@atpptc.com

Submitted by: Chen  
Approved by: YC Lin  
DATE: 14-Feb-25

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#### 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,

## mSMD020-90V

Alpha-Top (Sea & Land Alliance)

### Performance Specification

| Model       | $V_{max}$ | $I_{max}$ | $I_{hold}$   | $I_{trip}$   | $P_d$       | Maximum Time To Trip |               | Resistance           |                      | Agency Approval |     |
|-------------|-----------|-----------|--------------|--------------|-------------|----------------------|---------------|----------------------|----------------------|-----------------|-----|
|             | (Vdc)     | (A)       | @25°C<br>(A) | @25°C<br>(A) | Typ.<br>(W) | Current<br>(A)       | Time<br>(Sec) | $R_{i_{min}}$<br>(Ω) | $R_{1_{max}}$<br>(Ω) | UL              | TUV |
| mSMD020-90V | 90        | 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>1max</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                  |
|--------------------------------------------------------------------------|-----------------------------|
| Passive aging                                                            | +85°C, 1000 hrs.            |
| Humidity aging                                                           | +85°C, 85% R.H. , 168 hours |
| Thermal shock                                                            | +85°C to -40°C, 20 times    |
| Resistance to solvent                                                    | MIL-STD-202, Method 215     |
| Vibration                                                                | MIL-STD-202, Method 201     |
| Ambient operating conditions : - 40 °C to +85 °C                         |                             |
| Maximum surface temperature of the device in the tripped state is 125 °C |                             |
| In case of special use, please contact our engineer                      |                             |

### Agency Approvals :

Regulation/Standard:



2015/863/EU

EN14582

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

| Model       | Maximum ambient operating temperature (T <sub>max</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 |
| mSMD020-90V | 0.29                                                                                            | 0.26  | 0.23 | 0.20 | 0.17 | 0.15 | 0.14 | 0.12 | 0.10 |



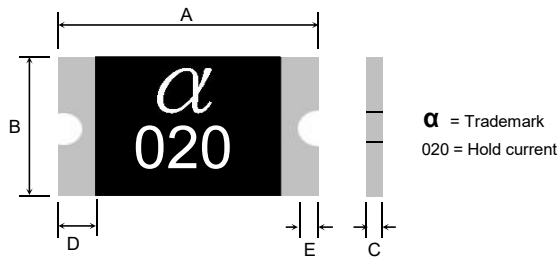
## mSMD020-90V

Alpha-Top (Sea & Land Alliance)

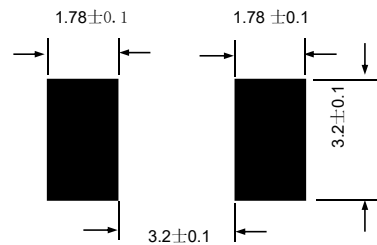
### Construction And Dimension (Unit:mm)

| Model       | A    |      | B    |      | C    |      | D    |      | E    |
|-------------|------|------|------|------|------|------|------|------|------|
|             | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. | Min. |
| mSMD020-90V | 4.37 | 4.73 | 3.07 | 3.41 | 0.90 | 1.80 | 0.30 | 0.25 |      |

### Dimensions & Marking



### Recommended Pad Layout (mm)



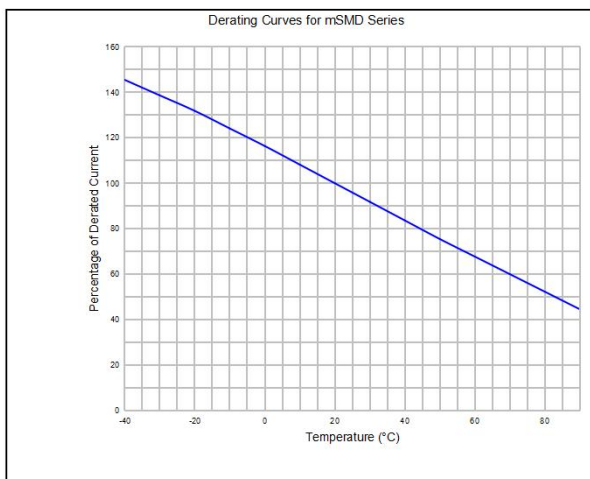
### Termination Pad Characteristics

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

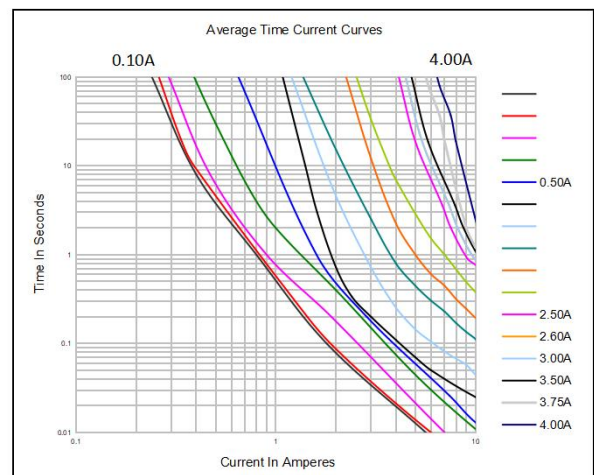
### Rework

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:

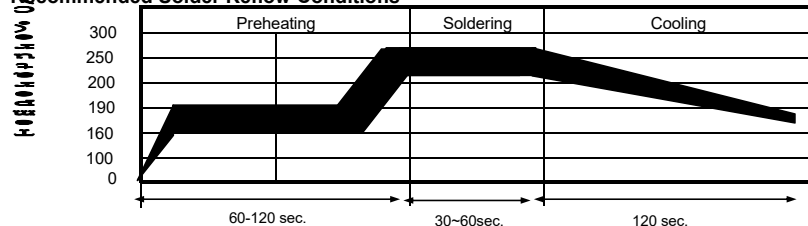
- Use PPTC beyond the maximum ratings or improper use may result in device damage and possible electrical arcing and flame.
- PPTC are intended for protection against occasional over current or over temperature fault conditions and should not be used when repeated fault conditions or prolonged trip events 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 performance of our devices.



## mSMD020-90V

Alpha-Top (Sea & Land Alliance)

### Recommended Solder Reflow Conditions

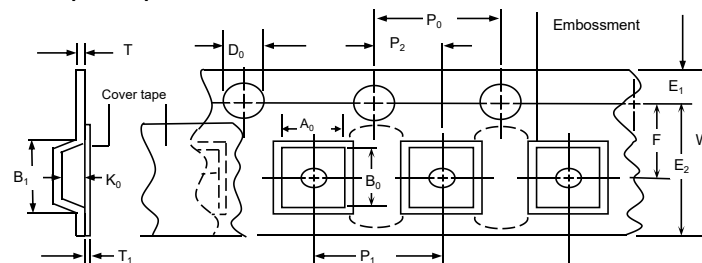


Recommended reflow methods: IR, vapor phase oven, hot air oven.  
 Devices are not designed to be wave soldered to the bottom side of the board.  
 Recommended maximum paste thickness is 0.25 mm (0.010 inch).  
 Devices can be cleaned using standard method and solvents.  
 Note: If reflow temperatures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

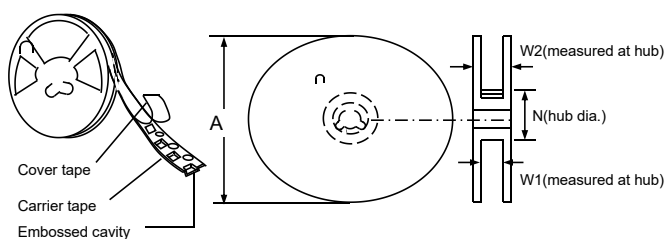
### Tape And Reel Specifications (mm)

| 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              |
| Reel Dimensions          |                  |
| 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                      | 020-90V | Packaging            |
|---------------------------|---------|----------------------|
| Product name              | Hold    | Tape & Reel Quantity |
| Size 4532mm/1812 inch     | Current | 1,500 pcs/reel       |
| SMD: surface mount device | 0.20A   |                      |

Tape & reel packaging per EIA481-1

### Labeling Information

