

➤ Features

- Size 0.04*0.02 inch /1.0*0.5 mm
- RoHS compliant, lead-free and halogen-free
- Fast response to fault current
- Super low resistance
- Low profile
- Compatible with high temperature solders

➤ Applications

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

➤ Electrical Characteristics (25°C)

| Part Number | I_{hold} | I_{trip} | V_{max} | I_{max} | $P_{d\ typ}$ | Time to trip | | R_{min} | R_{1max} |
|---------------|------------|------------|--------------------|-----------|--------------|--------------|-------|-----------|------------|
| | (A) | (A) | (V _{dc}) | (A) | (W) | (A) | (Sec) | (Ω) | (Ω) |
| BSMD0402L-005 | 0.05 | 0.20 | 9.0 | 40 | 0.5 | 0.25 | 1.50 | 1.500 | 20.00 |
| BSMD0402L-010 | 0.10 | 0.30 | 6.0 | 40 | 0.5 | 0.50 | 1.00 | 0.150 | 2.000 |
| BSMD0402L-020 | 0.20 | 0.50 | 6.0 | 40 | 0.5 | 1.00 | 1.00 | 0.100 | 1.250 |
| BSMD0402L-035 | 0.35 | 0.70 | 6.0 | 40 | 0.5 | 8.00 | 0.10 | 0.050 | 0.700 |
| BSMD0402L-050 | 0.50 | 1.00 | 6.0 | 40 | 0.5 | 8.00 | 0.10 | 0.040 | 0.400 |
| BSMD0402L-075 | 0.75 | 1.50 | 6.0 | 40 | 0.5 | 8.00 | 0.10 | 0.030 | 0.300 |

➤ Vocabulary

I_{hold} = Hold current: maximum current device will pass without tripping in 25°C still air.

I_{trip} = Trip current: minimum current at which the device will trip in 25°C still air.

V_{max} = Maximum voltage device can withstand without damage at rated current (I_{max}).

I_{max} = Maximum fault current device can withstand without damage at rated voltage (V_{max}).

$P_{d\ typ.}$ = Typical power dissipated from device when in the tripped state at 25°C still air.

R_{min} = Minimum resistance of device in initial (un-soldered) state.

R_{1max} = Maximum resistance of device at 25°C measured one hour after tripping or reflow soldering of 260°C for 20 sec.

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

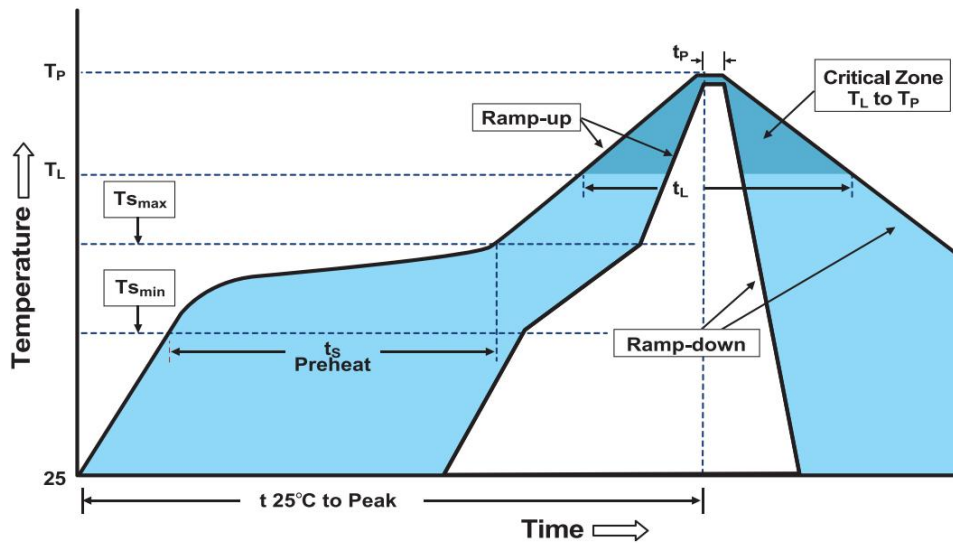
➤ Warning

- Users shall independently assess the suitability of these devices for each of their applications.
- Operation of these devices beyond the stated maximum ratings could result in damage to the devices and lead to electrical arcing and/or fire.
- These devices are intended to protect against the effects of temporary over-current or over-temperature conditions and are not intended to perform as protective devices where such conditions are expected to be repetitive or prolonged in duration.
- Exposure to silicon-based oils, solvents, electrolytes, acids, and similar materials can adversely affect the prolonged of these PPTC devices.
- These devices undergo thermal expansion under fault conditions, and thus shall be provided with adequate space and be protected against mechanical stresses.
- Circuits with inductance may generate a voltage ($L di/dt$) above the rated voltage of the PPTC device.

➤ Thermal Derating Chart

| Part Number | Ambient operating temperature hold current(I_{hold}) | | | | | | | | |
|---------------|--|-------|-------|------|-------|------|-------|-------|-------|
| | -40°C | -20°C | 0°C | 25°C | 40°C | 50°C | 60°C | 70°C | 85°C |
| BSMD0402L-005 | 0.073 | 0.065 | 0.058 | 0.05 | 0.044 | 0.04 | 0.037 | 0.033 | 0.028 |
| BSMD0402L-010 | 0.14 | 0.13 | 0.11 | 0.10 | 0.09 | 0.08 | 0.07 | 0.06 | 0.05 |
| BSMD0402L-020 | 0.29 | 0.26 | 0.23 | 0.20 | 0.18 | 0.16 | 0.15 | 0.13 | 0.09 |
| BSMD0402L-035 | 0.50 | 0.45 | 0.40 | 0.35 | 0.31 | 0.28 | 0.26 | 0.22 | 0.16 |
| BSMD0402L-050 | 0.71 | 0.64 | 0.57 | 0.50 | 0.44 | 0.40 | 0.37 | 0.31 | 0.23 |
| BSMD0402L-075 | 1.05 | 0.95 | 0.85 | 0.75 | 0.65 | 0.60 | 0.55 | 0.45 | 0.30 |

➤ **Soldering Parameters**



| Profile Feature | Pb-Free Assembly |
|--|----------------------------------|
| Average Ramp-Up Rate($T_{s_{max}}$ to T_p) | 3°C/second max |
| Preheat -Temperature Min($T_{s_{min}}$) -Temperature Max($T_{s_{max}}$) -Time($T_{s_{min}}$ to $T_{s_{max}}$) | 150°C 200°C 60~180 seconds |
| Time maintained above: -Temperature(T_L) -Time(t_L) | 217°C 60~150 seconds |
| Peak Temperature(T_p) | 260°C |
| Ramp-Down Rate | 6°C/second max |
| Time 25°C to Peak Temperature | 8 minutes max |
| Storage Condition | 0°C~30°C,30%-60%RH |

- Recommended reflow methods: IR, vapor phase oven, hot air oven, N₂ environment for lead-free.
- Recommended maximum paste thickness is 0.25mm.
- Devices can be cleaned using standard industry methods and solvents.

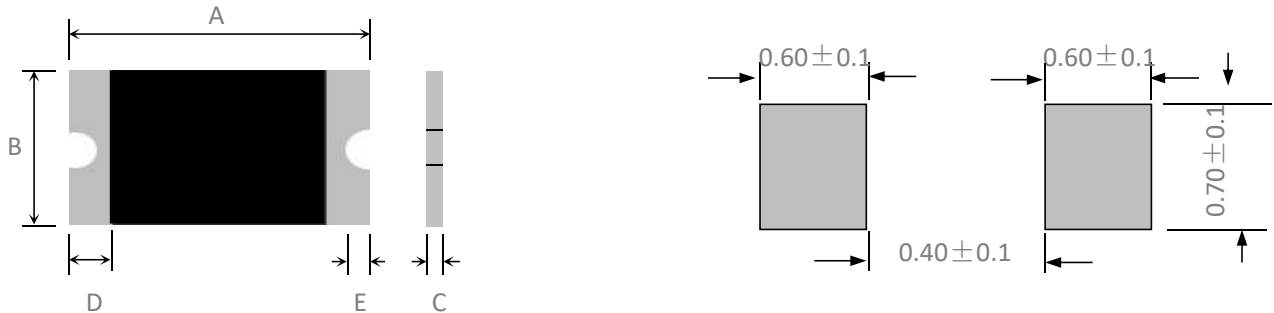
Note 1: All temperature refer to topside of the package, measured on the package body surface.

Note 2: If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.

➤ **Environmental Specifications**

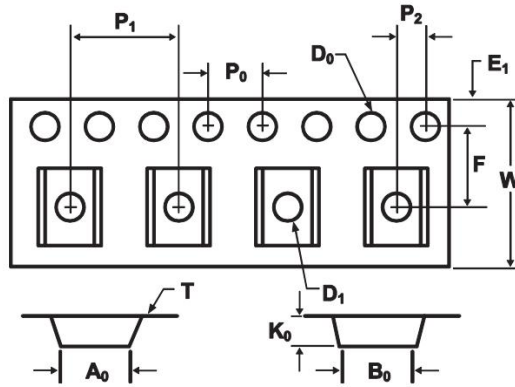
| Test | Conditions | Resistance change |
|--|-----------------------------|-------------------|
| Passive aging | +85°C, 1000 hours | ±5% typical |
| Humidity aging | +85°C, 85% R.H. , 168 hours | ±5% typical |
| Thermal shock | +85°C to -40°C, 20 times | ±33% typical |
| Resistance to solvent | MIL-STD-202,Method 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 | | |

➤ **Physical Dimensions & Recommended Pad Layout (mm)**



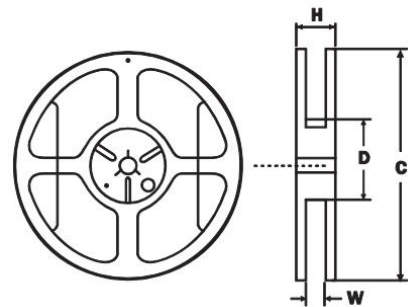
| Part Number | Marking | Quantity | A | | B | | C | | D | E |
|---------------|---------|----------|------|------|------|------|------|------|------|------|
| | | | Min | Max | Min | Max | Min | Max | Min | Max |
| BSMD0402L-005 | | 10000 | 0.85 | 1.15 | 0.35 | 0.65 | 0.20 | 0.80 | 0.80 | 0.40 |
| BSMD0402L-010 | | 10000 | 0.85 | 1.15 | 0.35 | 0.65 | 0.20 | 0.60 | 0.10 | 0.40 |
| BSMD0402L-020 | | 10000 | 0.85 | 1.15 | 0.35 | 0.65 | 0.20 | 0.60 | 0.10 | 0.40 |
| BSMD0402L-035 | | 10000 | 0.85 | 1.15 | 0.35 | 0.65 | 0.20 | 0.60 | 0.10 | 0.40 |
| BSMD0402L-050 | | 10000 | 0.85 | 1.15 | 0.35 | 0.65 | 0.20 | 0.60 | 0.10 | 0.40 |
| BSMD0402L-075 | | 10000 | 0.85 | 1.15 | 0.35 | 0.65 | 0.20 | 0.60 | 0.10 | 0.40 |

➤ **Tape And Reel Specifications (mm)**



| Governing Specifications | BSMD0402L-005 ~ BSMD0402L-050 | BSMD0402L-075 |
|--------------------------|----------------------------------|---------------|
| W | 8.0 ± 0.3 | 8.0 ± 0.3 |
| F | 3.5 ± 0.05 | 3.5 ± 0.05 |
| E ₁ | 1.75 ± 0.1 | 1.75 ± 0.1 |
| D ₀ | 1.55 ± 0.05 | 1.55 ± 0.05 |
| D ₁ | 1.0 ± 0.1 | 1.0 ± 0.1 |
| P ₀ | 4.0 ± 0.1 | 4.0 ± 0.1 |
| P ₁ | 4.0 ± 0.1 | 4.0 ± 0.1 |
| P ₂ | 2.0 ± 0.05 | 2.0 ± 0.05 |
| A ₀ | 0.69 ± 0.03 | 0.69 ± 0.03 |
| B ₀ | 1.23 ± 0.03 | 1.28 ± 0.03 |
| T | 0.2 ± 0.1 | 0.2 ± 0.1 |
| K ₀ | 0.60 ± 0.03 | 0.60 ± 0.05 |
| Leader _{min} | 390 | 390 |
| Trailer _{min} | 160 | 160 |

| Reel Dimensions | |
|-----------------|-------------|
| C | φ178 ± 1.0 |
| D | φ60.2 ± 0.5 |
| H | 11.0 ± 0.5 |
| W | 9.0 ± 1.5 |



➤ **Contact information**

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