

## ➤ 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 <sub>dc</sub> )	(A)	(W)	(A)	(Sec)	(Ω)	(Ω)
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.**

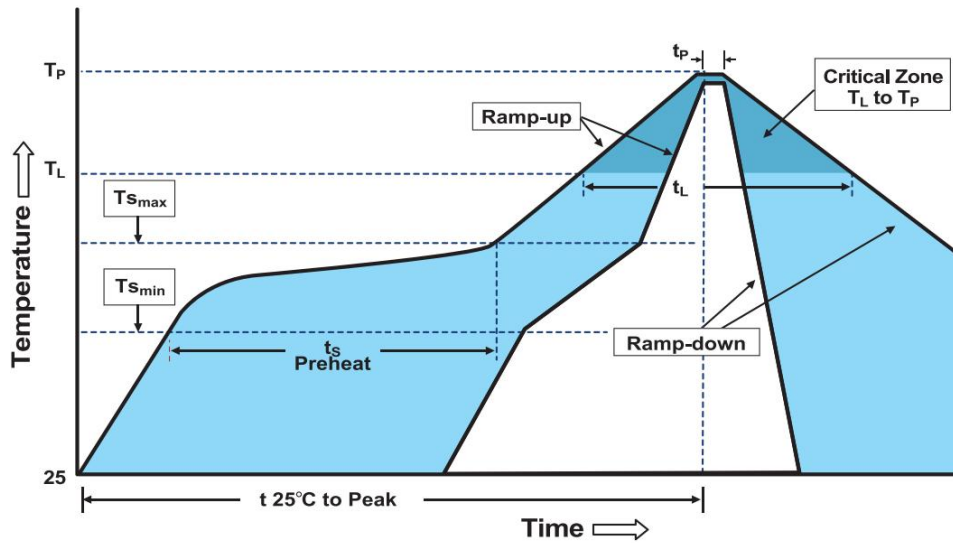
**➤ Warning**

- 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-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( $T_{smax}$ to $T_p$ )	3°C/second max
Preheat	
-Temperature Min( $T_{smin}$ )	150°C
-Temperature Max( $T_{smax}$ )	200°C
-Time( $T_{smin}$ to $T_{smax}$ )	60~180 seconds
Time maintained above:	
-Temperature( $T_L$ )	217°C
-Time( $t_L$ )	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, N<sub>2</sub> environment for lead-free.
- Recommended maximum paste thickness is 0.25mm.
- Devices can be cleaned using standard industry methods and solvents.

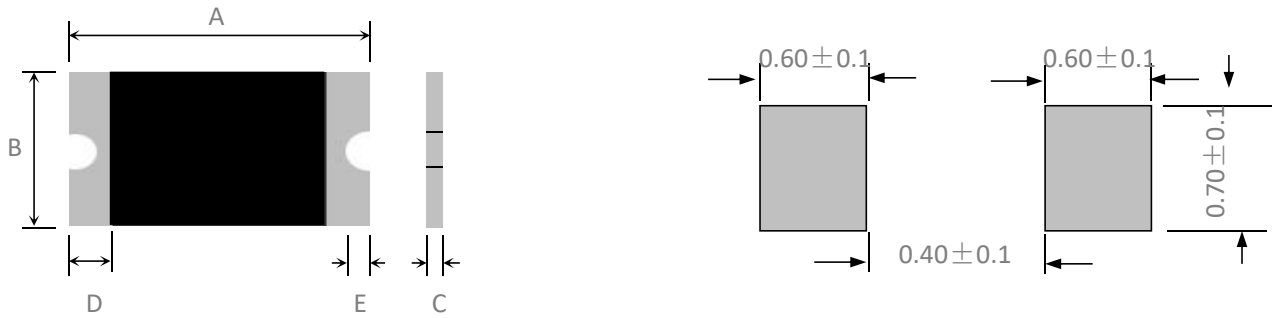
**Note 1:** All temperature refer to topside of the package, measured on the package body surface.

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

➤ Environmental Specifications

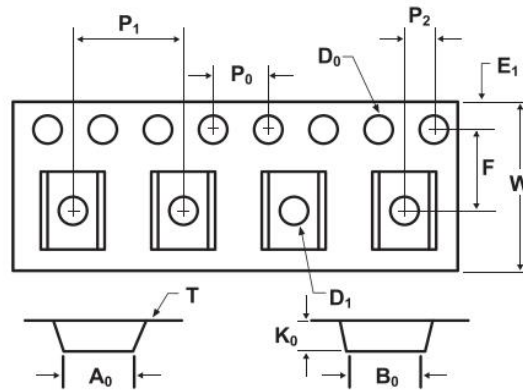
Test	Conditions	Resistance change
Passive aging	+85°C, 1000 hrs.	±5% typical
Humidity aging	+85°C, 85% R.H. , 168 hours	±5% typical
Thermal shock	+85°C to -40°C, 20 times	±33% typical
Resistance to solvent	MIL-STD-202,Method 215	No change
Vibration	MIL-STD-202,Method 201	No change
Ambient operating conditions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

➤ Physical Dimensions & Recommended Pad Layout (mm)



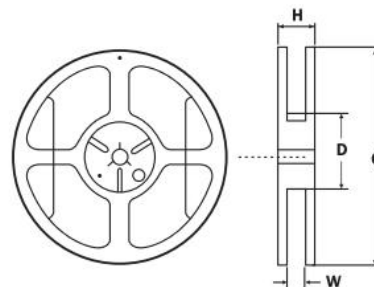
Part Number	Marking	Quantity	A		B		C		D	E
			Min	Max	Min	Max	Min	Max	Min	Max
BSMD0402L-010		10000	0.85	1.15	0.35	0.65	0.20	0.60	0.10	0.40
BSMD0402L-020		10000	0.85	1.15	0.35	0.65	0.20	0.60	0.10	0.40
BSMD0402L-035		10000	0.85	1.15	0.35	0.65	0.20	0.60	0.10	0.40
BSMD0402L-050		10000	0.85	1.15	0.35	0.65	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-010 ~ BSMD0402L-050	BSMD0402L-075
W	8.0 ± 0.3	8.0 ± 0.3
F	3.5 ± 0.05	3.5 ± 0.05
E <sub>1</sub>	1.75 ± 0.1	1.75 ± 0.1
D <sub>0</sub>	1.55 ± 0.05	1.55 ± 0.05
D <sub>1</sub>	1.0 ± 0.1	1.0 ± 0.1
P <sub>0</sub>	4.0 ± 0.1	4.0 ± 0.1
P <sub>1</sub>	4.0 ± 0.1	4.0 ± 0.1
P <sub>2</sub>	2.0 ± 0.05	2.0 ± 0.05
A <sub>0</sub>	0.69 ± 0.03	0.69 ± 0.03
B <sub>0</sub>	1.23 ± 0.03	1.28 ± 0.03
T	0.2 ± 0.1	0.2 ± 0.1
K <sub>0</sub>	0.60 ± 0.03	0.60 ± 0.05
Leader <sub>min</sub>	390	390
Trailer <sub>min</sub>	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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