

## ➤ Features

- Size 0.18\*0.12 inch /4.5\*3.2 mm
- RoHS compliant, lead-free and halogen-free
- Fast response to fault current
- 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)
BSMD1812-010-30V	0.10	0.30	30	40	0.8	0.50	1.50	0.750	15.00
BSMD1812-010-60V	0.10	0.30	60	40	0.8	0.50	1.50	0.750	15.00
BSMD1812-014-60V	0.14	0.34	60	40	0.8	1.50	0.15	0.650	6.000
BSMD1812-020-30V	0.20	0.40	30	40	0.8	8.00	0.04	0.350	5.000
BSMD1812-020-60V	0.20	0.40	60	40	0.8	8.00	0.04	0.350	5.000
BSMD1812-030-30V	0.30	0.60	30	40	0.8	8.00	0.10	0.250	3.000
BSMD1812-030-60V	0.30	0.60	60	40	0.8	8.00	0.10	0.250	3.000
BSMD1812-050-15V	0.50	1.00	15	40	0.8	8.00	0.15	0.150	1.400
BSMD1812-050-24V	0.50	1.00	24	40	0.8	8.00	0.15	0.150	1.400
BSMD1812-050-30V	0.50	1.00	30	40	0.8	8.00	0.15	0.150	1.400
BSMD1812-050-60V	0.50	1.00	60	40	0.8	8.00	0.15	0.150	1.400
BSMD1812-075-13.2V	0.75	1.50	13.2	40	0.8	8.00	0.20	0.090	0.450
BSMD1812-075-16V	0.75	1.50	16	40	0.8	8.00	0.20	0.090	0.450
BSMD1812-075-24V	0.75	1.50	24	40	0.8	8.00	0.20	0.090	0.450
BSMD1812-075-33V	0.75	1.50	33	40	0.8	8.00	0.20	0.090	0.450
BSMD1812-110-8V	1.10	2.20	8	100	0.8	8.00	0.30	0.045	0.250
BSMD1812-110-16V	1.10	2.20	16	100	0.8	8.00	0.30	0.045	0.250
BSMD1812-110-24V	1.10	2.20	24	40	0.8	8.00	0.30	0.045	0.250
BSMD1812-110-33V	1.10	2.20	33	40	0.8	8.00	0.30	0.045	0.250
BSMD1812-125-16V	1.25	2.50	16	100	0.8	8.00	0.40	0.050	0.160
BSMD1812-125-24V	1.25	2.50	24	40	0.8	8.00	0.40	0.050	0.160
BSMD1812-150-8V	1.50	3.00	8	100	0.8	8.00	0.50	0.040	0.160

Part Number	$I_{hold}$	$I_{trip}$	$V_{max}$	$I_{max}$	$P_{d\ typ}$	Time to trip		$R_i$	$R_{1max}$
	(A)	(A)	(V <sub>dc</sub> )	(A)	(W)	(A)	(Sec)	( $\Omega$ )	( $\Omega$ )
BSMD1812-150-16V	1.50	3.00	16	100	0.8	8.00	0.50	0.040	0.160
BSMD1812-150-24V	1.50	3.00	24	40	0.8	8.00	0.50	0.040	0.160
BSMD1812-150-33V	1.50	3.00	33	40	0.8	8.00	0.50	0.040	0.160
BSMD1812-160-8V	1.60	3.20	8	100	0.8	8.00	1.00	0.030	0.130
BSMD1812-160-16V	1.60	3.20	16	100	0.8	8.00	1.00	0.030	0.130
BSMD1812-160-24V	1.60	3.20	24	40	0.8	8.00	1.00	0.030	0.130
BSMD1812-200-8V	2.00	4.00	8	100	0.8	8.00	2.00	0.020	0.100
BSMD1812-200-12V	2.00	4.00	12	100	0.8	8.00	2.00	0.020	0.100
BSMD1812-200-16V	2.00	4.00	16	100	0.8	8.00	2.00	0.020	0.100
BSMD1812-200-24V	2.00	4.00	24	40	0.8	8.00	2.00	0.020	0.100
BSMD1812-200-30V	2.00	4.00	30	40	0.8	8.00	2.00	0.020	0.100
BSMD1812-250-8V	2.50	5.00	8	40	0.8	8.00	2.50	0.015	0.080
BSMD1812-260-8V	2.60	5.20	8	100	0.8	8.00	2.50	0.010	0.050
BSMD1812-260-13.2V	2.60	5.20	13.2	40	0.8	8.00	2.50	0.010	0.050
BSMD1812-260-16V	2.60	5.20	16	40	0.8	8.00	2.50	0.010	0.050
BSMD1812-300-8V	3.00	6.00	8	100	0.8	8.00	4.00	0.010	0.040
BSMD1812-300-12V	3.00	6.00	12	100	0.8	8.00	4.00	0.010	0.040
BSMD1812-300-16V	3.00	6.00	16	40	0.8	8.00	4.00	0.010	0.040
BSMD1812-350-6V	3.50	7.00	6	100	2.0	10.00	4.00	0.008	0.035
BSMD1812-350-16V	3.50	7.00	16	100	2.0	10.00	4.00	0.008	0.035
BSMD1812-400-6V	4.00	8.00	6	100	2.0	10.00	4.00	0.005	0.025

$I_{hold}$  = 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.

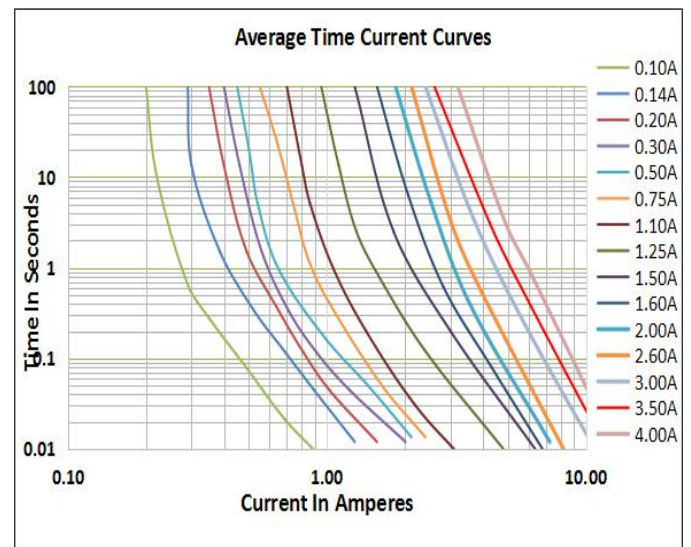
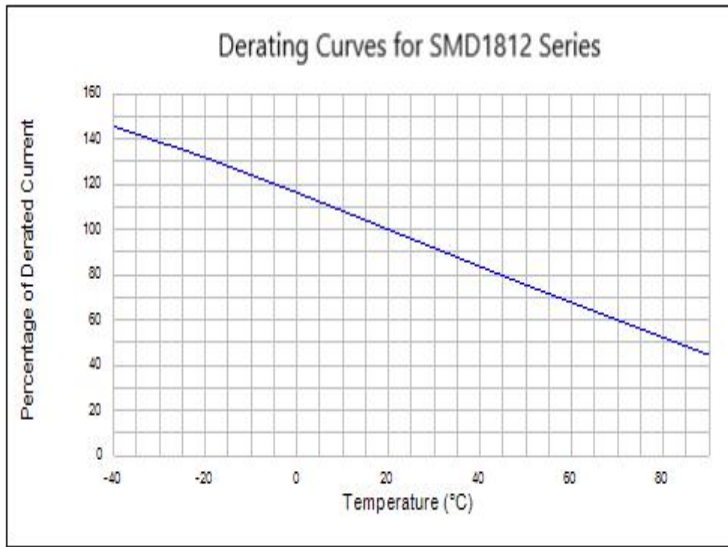
**Caution:** Operation beyond the specified ratings may result in damage and possible arcing and flame.

## ➤ 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 Curve

➤ Typical Time-to-Trip At 25°C



➤ Thermal Derating Chart

Part Number	Ambient operating temperature hold current(I <sub>hold</sub> )								
	-40°C	-20°C	0°C	25°C	40°C	50°C	60°C	70°C	85°C
BSMD1812-010	0.16	0.14	0.12	0.10	0.08	0.07	0.06	0.05	0.03
BSMD1812-014	0.23	0.19	0.17	0.14	0.12	0.10	0.09	0.08	0.06
BSMD1812-020	0.29	0.26	0.23	0.20	0.17	0.15	0.14	0.12	0.10
BSMD1812-030	0.44	0.39	0.35	0.30	0.26	0.23	0.21	0.18	0.15
BSMD1812-050	0.69	0.59	0.55	0.50	0.45	0.43	0.35	0.30	0.23
BSMD1812-075	1.10	0.99	0.87	0.75	0.63	0.57	0.49	0.45	0.35
BSMD1812-110	1.60	1.45	1.28	1.10	0.92	0.83	0.71	0.66	0.52
BSMD1812-125	2.00	1.75	1.52	1.25	1.00	0.95	0.90	0.75	0.53
BSMD1812-150	2.10	1.96	1.77	1.50	1.23	1.09	0.95	0.82	0.61
BSMD1812-160	2.30	2.05	1.88	1.60	1.26	1.12	0.98	0.84	0.63
BSMD1812-200	2.88	2.61	2.25	2.00	1.80	1.66	1.45	1.09	0.80
BSMD1812-260	3.90	3.42	2.96	2.60	2.22	2.07	1.94	1.35	1.00
BSMD1812-300	4.15	3.76	3.46	3.00	2.55	2.28	2.01	1.61	1.33
BSMD1812-350	4.84	4.39	4.04	3.50	2.98	2.66	2.35	1.88	1.55
BSMD1812-400	4.97	4.62	4.32	4.00	3.48	3.16	2.85	2.38	2.05

➤ Soldering Parameters



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

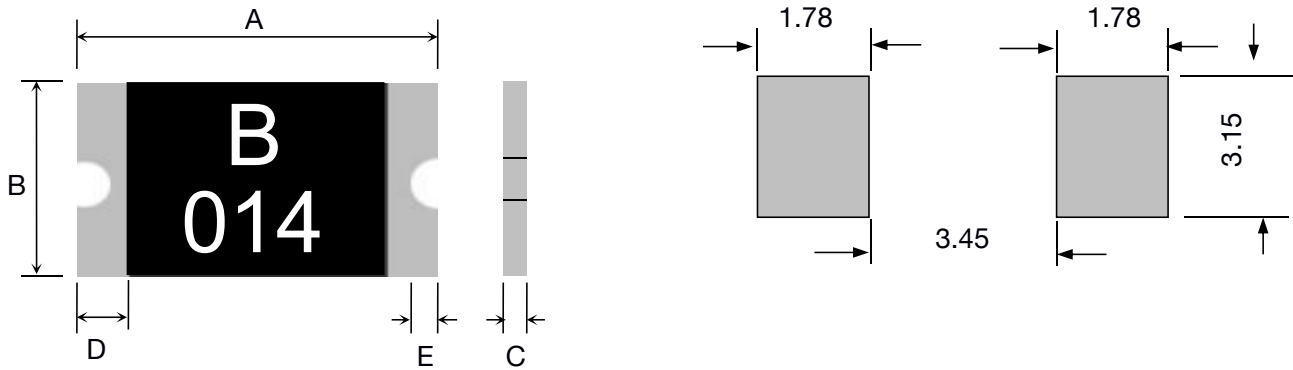
**Note 1: All temperature refer to topside of the package, measured on the package body surface.**

**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
<b>Ambient operating conditions : - 40 °C to +85 °C</b>		
<b>Maximum surface temperature of the device in the tripped state is 125 °C</b>		

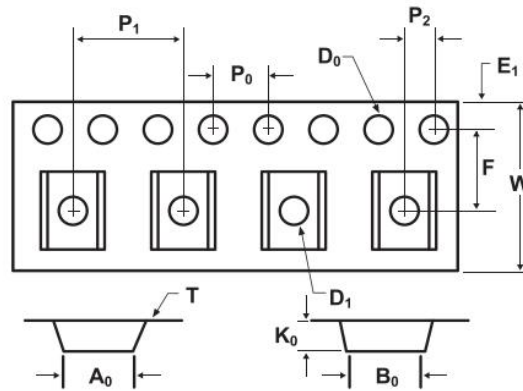
➤ Physical Dimensions & Recommended Pad Layout (mm)



Part Number	Marking	Quantity	A		B		C		D	E
			Min	Max	Min	Max	Min	Max	Min	Min
BSMD1812-010-30V	B010	1500	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
BSMD1812-010-60V	B010	1500	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
BSMD1812-014-60V	B014	1500	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
BSMD1812-020-30V	B020	1500	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
BSMD1812-020-60V	B020	1500	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
BSMD1812-030-30V	B030	1500	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
BSMD1812-030-60V	B030	1500	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
BSMD1812-050-15V	B050	1500	4.37	4.73	3.07	3.41	0.40	1.00	0.30	0.25
BSMD1812-050-24V	B050	1500	4.37	4.73	3.07	3.41	0.40	1.00	0.30	0.25
BSMD1812-050-30V	B050	1500	4.37	4.73	3.07	3.41	0.40	1.00	0.30	0.25
BSMD1812-050-60V	B050	1500	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
BSMD1812-075-13.2V	B075	1500	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
BSMD1812-075-16V	B075	1500	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
BSMD1812-075-24V	B075	1500	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
BSMD1812-075-33V	B075	1500	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
BSMD1812-110-8V	B110	1500	4.37	4.73	3.07	3.41	0.40	1.00	0.30	0.25
BSMD1812-110-16V	B110	1500	4.37	4.73	3.07	3.41	0.40	1.00	0.30	0.25
BSMD1812-110-24V	B110	1500	4.37	4.73	3.07	3.41	0.40	1.00	0.30	0.25
BSMD1812-110-33V	B110	1500	4.37	4.73	3.07	3.41	0.60	1.30	0.30	0.25
BSMD1812-125-16V	B125	1500	4.37	4.73	3.07	3.41	0.60	1.30	0.30	0.25
BSMD1812-125-24V	B125	1500	4.37	4.73	3.07	3.41	0.60	1.30	0.30	0.25
BSMD1812-150-8V	B150	1500	4.37	4.73	3.07	3.41	0.60	1.30	0.30	0.25
BSMD1812-150-16V	B150	1500	4.37	4.73	3.07	3.41	0.60	1.30	0.30	0.25
BSMD1812-150-24V	B150	1500	4.37	4.73	3.07	3.41	0.80	1.50	0.30	0.25
BSMD1812-150-33V	B150	1500	4.37	4.73	3.07	3.41	0.80	1.50	0.30	0.25

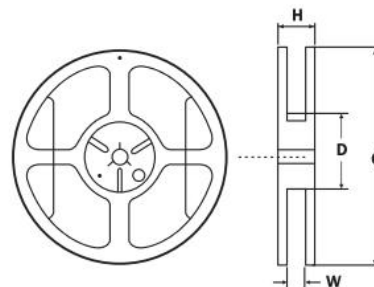
Part Number	Marking	Quantity	A		B		C		D	E
			Min	Max	Min	Max	Min	Max	Min	Min
BSMD1812-160-8V	B160	1500	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
BSMD1812-160-16V	B160	1500	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
BSMD1812-160-24V	B160	1500	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.25
BSMD1812-200-8V	B200	1500	4.37	4.73	3.07	3.41	0.60	1.30	0.30	0.25
BSMD1812-200-12V	B200	1500	4.37	4.73	3.07	3.41	0.60	1.30	0.30	0.25
BSMD1812-200-16V	B200	1500	4.37	4.73	3.07	3.41	0.60	1.30	0.30	0.25
BSMD1812-200-24V	B200	1500	4.37	4.73	3.07	3.41	0.60	1.50	0.30	0.25
BSMD1812-200-30V	B200	1500	4.37	4.73	3.07	3.41	0.60	1.50	0.30	0.25
BSMD1812-250-8V	B250	1500	4.37	4.73	3.07	3.41	0.60	1.50	0.30	0.25
BSMD1812-260-8V	B260	1500	4.37	4.73	3.07	3.41	0.60	1.50	0.30	0.25
BSMD1812-260-13.2V	B260	1500	4.37	4.73	3.07	3.41	0.60	1.50	0.30	0.25
BSMD1812-260-16V	B260	1500	4.37	4.73	3.07	3.41	0.60	1.50	0.30	0.25
BSMD1812-300-8V	B300	1500	4.37	4.73	3.07	3.41	0.60	1.50	0.30	0.25
BSMD1812-300-12V	B300	1500	4.37	4.73	3.07	3.41	0.60	1.50	0.30	0.25
BSMD1812-300-16V	B300	1500	4.37	4.73	3.07	3.41	0.60	1.50	0.30	0.25
BSMD1812-350-6V	B350	1500	4.37	4.73	3.07	3.41	0.60	1.50	0.30	0.25
BSMD1812-350-16V	B350	1500	4.37	4.73	3.07	3.41	0.60	1.50	0.30	0.25
BSMD1812-400-6V	B400	1500	4.37	4.73	3.07	3.41	0.60	1.50	0.30	0.25

➤ Tape And Reel Specifications (mm)



Governing Specifications	BSMD1812-010-30V~ BSMD1812-075-33V	BSMD1812-110-16V~ BSMD1812-200-16V	BSMD1812-200-24V~ BSMD1812-400-6V
W	12.0 ± 0.3	12.0 ± 0.3	12.0 ± 0.3
F	5.5 ± 0.05	5.5 ± 0.05	5.5 ± 0.05
E1	1.75 ± 0.1	1.75 ± 0.1	1.75 ± 0.1
D0	1.55 ± 0.05	1.55 ± 0.05	1.55 ± 0.05
D1	1.55 <sub>min</sub>	1.55 <sub>min</sub>	1.55 <sub>min</sub>
P0	4.0 ± 0.1	4.0 ± 0.1	4.0 ± 0.1
P1	8.0 ± 0.1	8.0 ± 0.1	8.0 ± 0.1
P2	2.0 ± 0.05	2.0 ± 0.05	2.0 ± 0.05
A0	3.58 ± 0.1	3.58 ± 0.1	3.58 ± 0.1
B0	4.93 ± 0.1	4.93 ± 0.1	4.93 ± 0.1
T	0.2 ± 0.1	0.2 ± 0.1	0.2 ± 0.1
K0	0.74 ± 0.1	1.04 ± 0.1	1.35 ± 0.1
Leader <sub>min</sub>	390	390	390
Trailer <sub>min</sub>	160	160	160

Reel Dimensions	
C	φ178 ± 1.0
D	φ60.2 ± 0.5
H	16.0 ± 0.5
W	13.2 ± 1.5



➤ Contact information

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