

➤ Features

- Size 0.06*0.03 inch /1.5*0.8 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 | Time to trip | | R_{min} | R_{1max} |
|------------------|------------|------------|-----------|-----------|-------|--------------|-------|--------------|--------------|
| | (A) | (A) | (V) | (A) | (W) | (A) | (Sec) | (Ω) | (Ω) |
| BSMD0603-001-60V | 0.01 | 0.03 | 60 | 20 | 0.5 | 0.20 | 1.00 | 15.00 | 100.0 |
| BSMD0603-002-60V | 0.02 | 0.06 | 60 | 20 | 0.5 | 0.20 | 1.00 | 12.00 | 70.0 |
| BSMD0603-003-30V | 0.03 | 0.09 | 30 | 20 | 0.5 | 0.20 | 1.00 | 6.00 | 50.0 |
| BSMD0603-004-24V | 0.04 | 0.12 | 24 | 20 | 0.5 | 0.20 | 1.00 | 4.00 | 40.0 |
| BSMD0603-005-15V | 0.05 | 0.15 | 15 | 40 | 0.5 | 0.25 | 1.00 | 3.80 | 30.0 |
| BSMD0603-005-24V | 0.05 | 0.15 | 24 | 40 | 0.5 | 0.25 | 1.00 | 3.80 | 30.0 |
| BSMD0603-005-33V | 0.05 | 0.15 | 33 | 40 | 0.5 | 0.25 | 1.00 | 3.80 | 30.0 |
| BSMD0603-010-15V | 0.10 | 0.30 | 15 | 40 | 0.5 | 0.50 | 0.60 | 0.90 | 8.00 |
| BSMD0603-010-24V | 0.10 | 0.30 | 24 | 40 | 0.5 | 0.50 | 0.60 | 0.90 | 8.00 |
| BSMD0603-010-33V | 0.10 | 0.30 | 33 | 40 | 0.5 | 0.50 | 0.60 | 0.90 | 8.00 |
| BSMD0603-020-9V | 0.20 | 0.50 | 9 | 40 | 0.5 | 1.00 | 0.60 | 0.55 | 3.50 |
| BSMD0603-020-16V | 0.20 | 0.50 | 16 | 40 | 0.5 | 1.00 | 0.60 | 0.55 | 3.50 |
| BSMD0603-025-9V | 0.25 | 0.55 | 9 | 40 | 0.5 | 8.00 | 0.08 | 0.50 | 3.00 |
| BSMD0603-025-16V | 0.25 | 0.55 | 16 | 40 | 0.5 | 8.00 | 0.08 | 0.50 | 3.00 |
| BSMD0603-035-6V | 0.35 | 0.75 | 6 | 40 | 0.5 | 8.00 | 0.10 | 0.20 | 1.40 |
| BSMD0603-035-12V | 0.35 | 0.75 | 12 | 40 | 0.5 | 8.00 | 0.10 | 0.20 | 1.40 |
| BSMD0603-035-16V | 0.35 | 0.75 | 16 | 40 | 0.5 | 8.00 | 0.10 | 0.20 | 1.40 |
| BSMD0603-050-6V | 0.50 | 1.00 | 6 | 40 | 0.5 | 8.00 | 0.10 | 0.10 | 0.80 |
| BSMD0603-050-9V | 0.50 | 1.00 | 9 | 40 | 0.5 | 8.00 | 0.10 | 0.10 | 0.80 |
| BSMD0603-050-12V | 0.50 | 1.00 | 12 | 40 | 0.5 | 8.00 | 0.10 | 0.10 | 0.80 |
| BSMD0603-075-6V | 0.75 | 1.50 | 6 | 40 | 0.5 | 8.00 | 0.10 | 0.06 | 0.45 |
| BSMD0603-075-8V | 0.75 | 1.50 | 8 | 40 | 0.5 | 8.00 | 0.10 | 0.06 | 0.45 |

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.

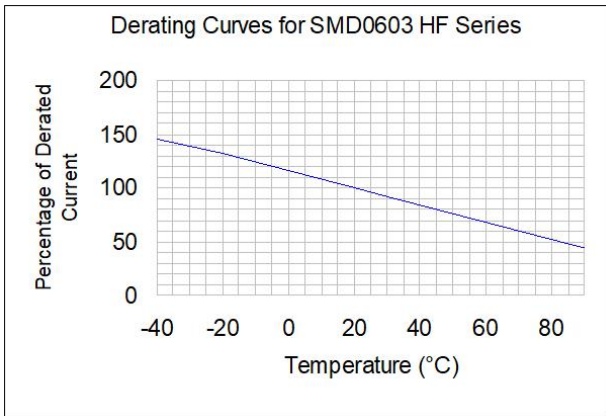
$R_{I_{max}}$ = Maximum resistance of device at 25°C measured one hour after tripping or reflow soldering of 260°C for 20 sec.

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

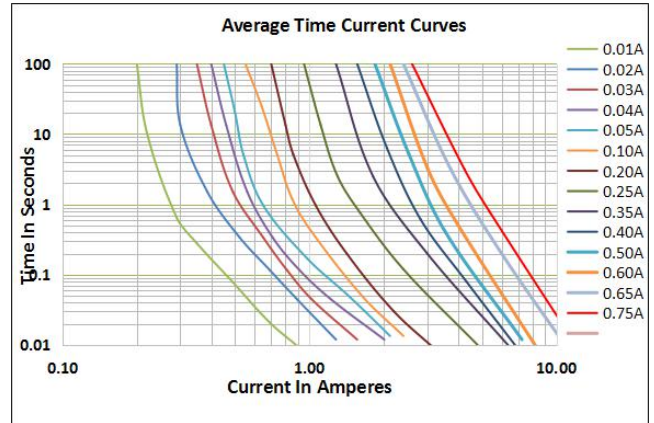
➤ WARNING

- 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 performance 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_{hold}) | | | | | | | | |
|--------------|--|-------|-------|-------|-------|-------|-------|-------|--------|
| | -40°C | -20°C | 0°C | 25°C | 40°C | 50°C | 60°C | 70°C | 85°C |
| BSMD0603-001 | 0.016 | 0.014 | 0.012 | 0.010 | 0.008 | 0.007 | 0.006 | 0.005 | 0.0035 |
| BSMD0603-002 | 0.031 | 0.027 | 0.024 | 0.020 | 0.016 | 0.014 | 0.012 | 0.011 | 0.007 |
| BSMD0603-003 | 0.048 | 0.041 | 0.036 | 0.030 | 0.024 | 0.021 | 0.018 | 0.016 | 0.011 |
| BSMD0603-004 | 0.052 | 0.048 | 0.044 | 0.040 | 0.032 | 0.028 | 0.024 | 0.020 | 0.012 |
| BSMD0603-005 | 0.065 | 0.060 | 0.055 | 0.050 | 0.040 | 0.035 | 0.031 | 0.025 | 0.015 |
| BSMD0603-010 | 0.13 | 0.12 | 0.11 | 0.10 | 0.08 | 0.07 | 0.06 | 0.05 | 0.03 |
| BSMD0603-020 | 0.27 | 0.25 | 0.23 | 0.20 | 0.17 | 0.14 | 0.12 | 0.10 | 0.07 |
| BSMD0603-025 | 0.32 | 0.29 | 0.27 | 0.25 | 0.21 | 0.18 | 0.16 | 0.14 | 0.10 |
| BSMD0603-035 | 0.47 | 0.41 | 0.38 | 0.35 | 0.29 | 0.26 | 0.24 | 0.20 | 0.14 |
| BSMD0603-050 | 0.67 | 0.59 | 0.51 | 0.50 | 0.41 | 0.37 | 0.34 | 0.29 | 0.20 |
| BSMD0603-075 | 0.98 | 0.85 | 0.81 | 0.75 | 0.60 | 0.54 | 0.44 | 0.40 | 0.31 |

➤ Soldering Parameters



| | |
|--|--------------------|
| Profile Feature | Pb-Free Assembly |
| Average Ramp-Up Rate(Ts_{max} to T_p) | 3°C/second max |
| Preheat | |
| -Temperature Min(Ts _{min}) | 150°C |
| -Temperature Max(Ts _{max}) | 200°C |
| -Time(Ts _{min} to Ts _{max}) | 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, N2 environment for lead-free.
- Recommended maximum paste thickness is 0.25mm.
- Devices can be cleaned using standard industry methods and solvents.

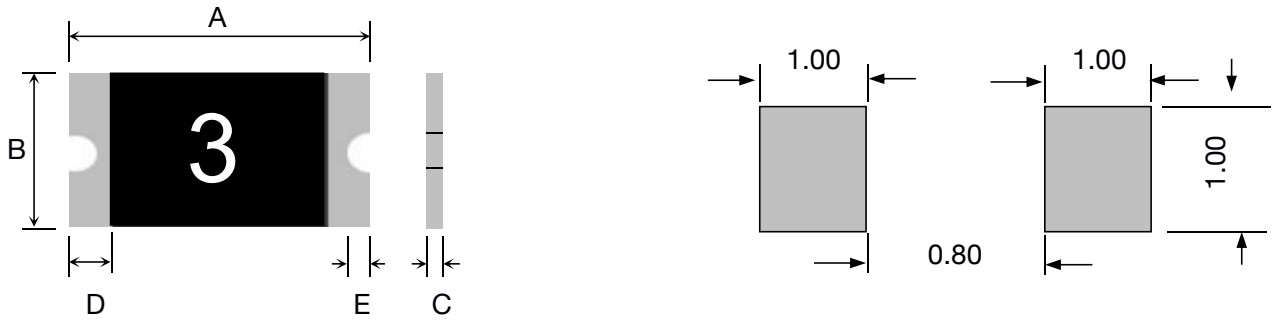
Note 1: All temperature refer to topside of the package, measured on the package body surface.

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

➤ Environmental Specifications

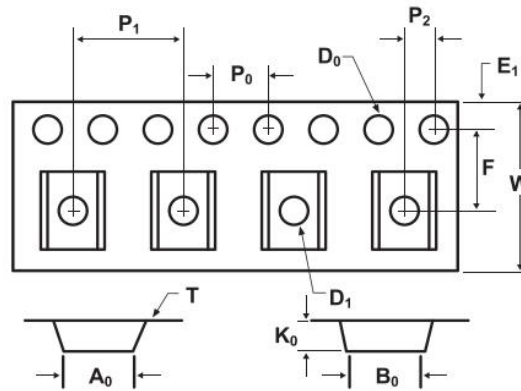
| Test | Conditions | Resistance change |
|---|-----------------------------|-------------------|
| Passive aging | +85°C, 1000 hrs. | ±5% typical |
| Humidity aging | +85°C, 85% R.H. , 168 hours | ±5% typical |
| Thermal shock | +85°C to -40°C, 20 times | ±33% typical |
| Resistance to solvent | MIL-STD-202,Method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



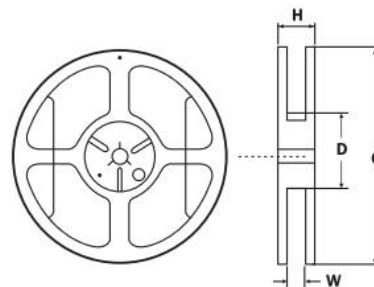
| Part Number | Marking | Quantity | A | | B | | C | | D | E |
|------------------|---------|----------|------|------|------|------|------|------|------|------|
| | | | Min | Max | Min | Max | Min | Max | Min | Min |
| BSMD0603-001-60V | X | 4000 | 1.45 | 1.85 | 0.65 | 1.05 | 0.40 | 1.00 | 0.15 | 0.10 |
| BSMD0603-002-60V | Y | 4000 | 1.45 | 1.85 | 0.65 | 1.05 | 0.40 | 1.00 | 0.15 | 0.10 |
| BSMD0603-003-30V | Z | 4000 | 1.45 | 1.85 | 0.65 | 1.05 | 0.40 | 1.00 | 0.15 | 0.10 |
| BSMD0603-004-24V | - | 4000 | 1.45 | 1.85 | 0.65 | 1.05 | 0.40 | 1.00 | 0.15 | 0.10 |
| BSMD0603-005-15V | - | 4000 | 1.45 | 1.85 | 0.65 | 1.05 | 0.40 | 1.00 | 0.15 | 0.10 |
| BSMD0603-005-24V | - | 4000 | 1.45 | 1.85 | 0.65 | 1.05 | 0.40 | 1.00 | 0.15 | 0.10 |
| BSMD0603-005-33V | - | 4000 | 1.45 | 1.85 | 0.65 | 1.05 | 0.40 | 1.00 | 0.15 | 0.10 |
| BSMD0603-010-15V | 1 | 5000 | 1.45 | 1.85 | 0.65 | 1.05 | 0.40 | 1.00 | 0.15 | 0.10 |
| BSMD0603-010-24V | 1 | 5000 | 1.45 | 1.85 | 0.65 | 1.05 | 0.40 | 1.00 | 0.15 | 0.10 |
| BSMD0603-010-33V | 1 | 5000 | 1.45 | 1.85 | 0.65 | 1.05 | 0.40 | 1.00 | 0.15 | 0.10 |
| BSMD0603-020-9V | 2 | 5000 | 1.45 | 1.85 | 0.65 | 1.05 | 0.40 | 1.00 | 0.15 | 0.10 |
| BSMD0603-020-16V | 2 | 5000 | 1.45 | 1.85 | 0.65 | 1.05 | 0.40 | 1.00 | 0.15 | 0.10 |
| BSMD0603-025-9V | 2 | 5000 | 1.45 | 1.85 | 0.65 | 1.05 | 0.40 | 1.00 | 0.15 | 0.10 |
| BSMD0603-025-16V | 2 | 5000 | 1.45 | 1.85 | 0.65 | 1.05 | 0.40 | 1.00 | 0.15 | 0.10 |
| BSMD0603-035-6V | 3 | 5000 | 1.45 | 1.85 | 0.65 | 1.05 | 0.40 | 1.00 | 0.15 | 0.10 |
| BSMD0603-035-12V | 3 | 5000 | 1.45 | 1.85 | 0.65 | 1.05 | 0.40 | 1.00 | 0.15 | 0.10 |
| BSMD0603-035-16V | 3 | 5000 | 1.45 | 1.85 | 0.65 | 1.05 | 0.40 | 1.00 | 0.15 | 0.10 |
| BSMD0603-050-6V | 5 | 4000 | 1.45 | 1.85 | 0.65 | 1.05 | 0.55 | 1.15 | 0.15 | 0.10 |
| BSMD0603-050-9V | 5 | 4000 | 1.45 | 1.85 | 0.65 | 1.05 | 0.55 | 1.15 | 0.15 | 0.10 |
| BSMD0603-050-12V | 5 | 4000 | 1.45 | 1.85 | 0.65 | 1.05 | 0.55 | 1.15 | 0.15 | 0.10 |
| BSMD0603-075-6V | 7 | 4000 | 1.45 | 1.85 | 0.65 | 1.05 | 0.55 | 1.15 | 0.15 | 0.10 |
| BSMD0603-075-8V | 7 | 4000 | 1.45 | 1.85 | 0.65 | 1.05 | 0.55 | 1.15 | 0.15 | 0.10 |

➤ Tape And Reel Specifications (mm)



| Governing Specifications | BSMD0603-001-60V~ BSMD0603-025-16V | BSMD0603-035-6V~ BSMD0603-075-8V | BSMD0603-100-6V |
|--------------------------|---------------------------------------|-------------------------------------|-----------------|
| W | 8.0 ± 0.3 | 8.0 ± 0.3 | 8.0 ± 0.3 |
| F | 3.5 ± 0.05 | 3.5 ± 0.05 | 3.5 ± 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 | 1.0 ± 0.1 | 1.0 ± 0.1 | 1.0 ± 0.1 |
| P0 | 4.0 ± 0.1 | 4.0 ± 0.1 | 4.0 ± 0.1 |
| P1 | 4.0 ± 0.1 | 4.0 ± 0.1 | 4.0 ± 0.1 |
| P2 | 2.0 ± 0.05 | 2.0 ± 0.05 | 2.0 ± 0.05 |
| A0 | 1.10 ± 0.1 | 1.10 ± 0.1 | 1.10 ± 0.1 |
| B0 | 1.95 ± 0.1 | 1.95 ± 0.1 | 1.95 ± 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 _{min} | 390 | 390 | 390 |
| Trailer _{min} | 160 | 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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