

Application:	All high-density boards
Product Features:	Small surface mountable, solid state, faster time to trip than standard SMD devices, lower resistance than standard SMD devices
Operation Current:	10mA~200mA
Maximum Operation Voltage:	9VDC ~60VDC
Temperature Range:	-40°C to 85°C
Agency Recognition:	UL, C-UL and TÜV

Electrical Characteristics (23°C)

Part Number	Hold Current	Trip Current	Rated Voltage	Maximum Current	Typical Power	Max. Time to Trip		Resistance Tolerance	
	I _H , A	I _T , A	V _{MAX} , VDC	I _{MAX} , A	P _d , W	I, A	Time, sec	R _{MIN}	R _{1MAX}
								ohms	ohms
SMD0603-001-60R	0.01	0.03	60	40	0.5	0.20	1.00	15.00	100.00
SMD0603-002-60R	0.02	0.06	60	40	0.5	0.20	1.00	12.00	70.00
SMD0603-003-30R	0.03	0.09	30	40	0.5	0.20	1.00	6.00	50.00
SMD0603-004-24R	0.04	0.12	24	40	0.5	0.20	1.00	4.00	40.00
SMD0603-005-15R	0.05	0.15	15	40	0.5	0.50	0.10	3.80	30.00
SMD0603-010-15R	0.10	0.25	15	40	0.5	0.70	0.10	0.90	8.00
SMD0603-012-9R	0.12	0.30	9	40	0.5	0.80	0.10	1.10	5.80
SMD0603-016-9R	0.16	0.40	9	40	0.5	1.00	0.10	1.00	4.20
SMD0603-020-9R	0.20	0.45	9	40	0.5	2.00	0.10	0.55	3.50

I_H: Hold current-maximum current at which the device will not trip at 23°C still air.

I_T: Trip current-minimum current at which the device will always trip at 23°C still air.

V_{MAX}: Maximum voltage device can withstand without damage at its rated current.

I_{MAX}: Maximum fault current device can withstand without damage at rated voltage (V MAX).

P_d: Typical power dissipated from device when in tripped state in 23°C still air environment.

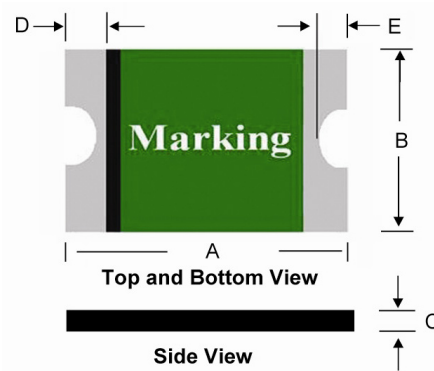
R_{MIN}: Minimum device resistance at 23°C.

R_{1MAX}: Maximum device resistance at 23°C, 1 hour after tripping .

Termination pad characteristics:

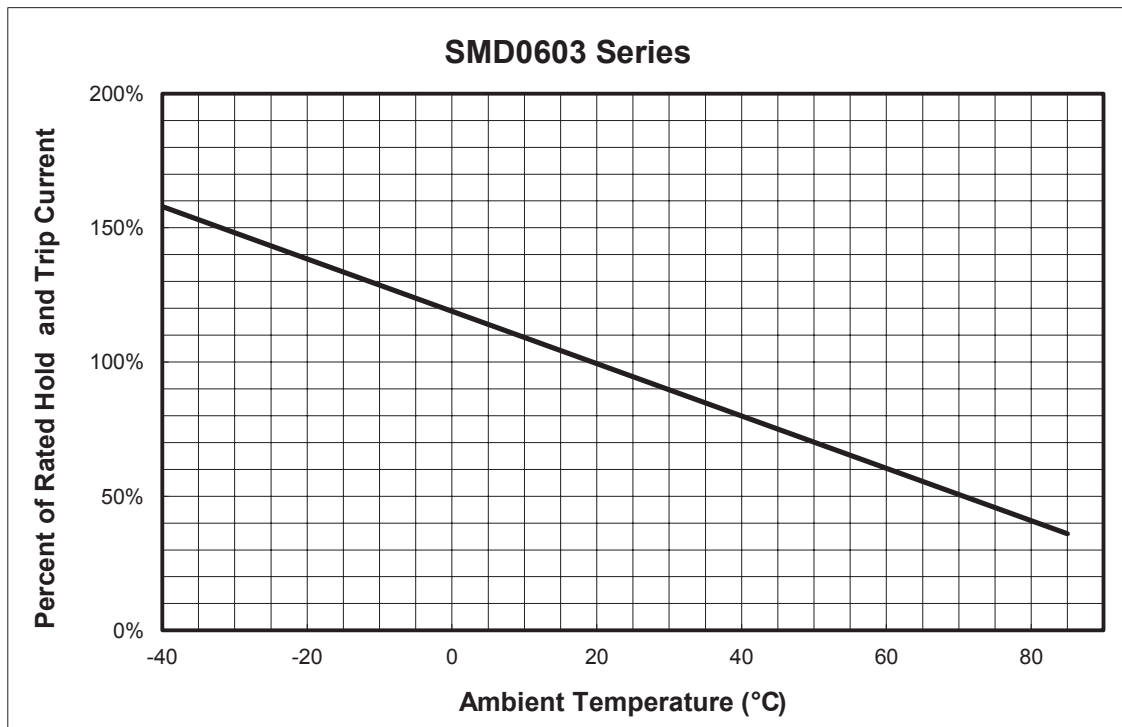
Terminal pad materials: Pure Tin

SMD0603 Product Dimensions (Millimeters)



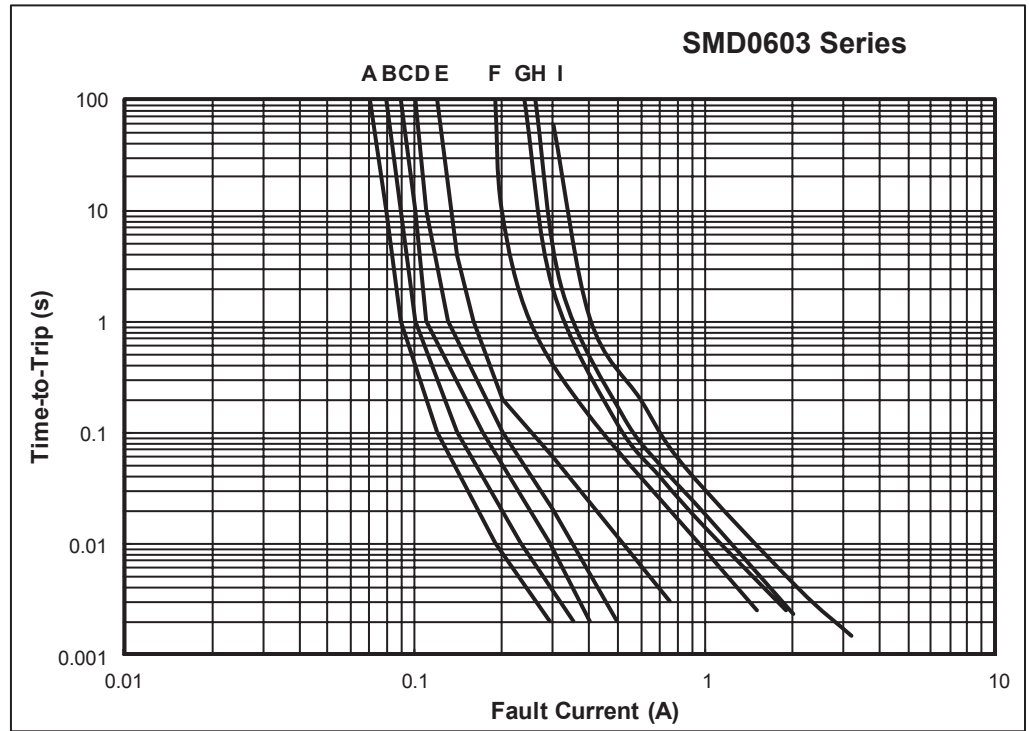
Part Number	A		B		C		D		E	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
SMD0603-001-60R	1.40	1.80	0.45	1.00	0.35	0.85	0.10	0.50	0.08	0.40
SMD0603-002-60R	1.40	1.80	0.45	1.00	0.35	0.85	0.10	0.50	0.08	0.40
SMD0603-003-30R	1.40	1.80	0.45	1.00	0.35	0.75	0.10	0.50	0.08	0.40
SMD0603-004-24R	1.40	1.80	0.45	1.00	0.35	0.75	0.10	0.50	0.08	0.40
SMD0603-005-15R	1.40	1.80	0.45	1.00	0.35	0.75	0.10	0.50	0.08	0.40
SMD0603-010-15R	1.40	1.80	0.45	1.00	0.35	0.75	0.10	0.50	0.08	0.40
SMD0603-012-9R	1.40	1.80	0.45	1.00	0.35	0.75	0.10	0.50	0.08	0.40
SMD0603-016-9R	1.40	1.80	0.45	1.00	0.35	0.75	0.10	0.50	0.08	0.40
SMD0603-020-9R	1.40	1.80	0.45	1.00	0.35	0.75	0.10	0.50	0.08	0.40

Thermal Derating Curve

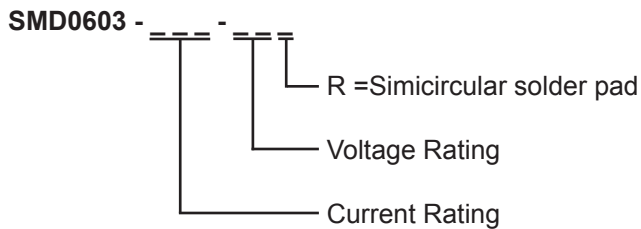


SMD0603 Typical Time-To-Trip at 23°C

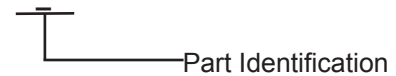
- A = SMD0603-001-60R
- B = SMD0603-002-60R
- C = SMD0603-003-30R
- D = SMD0603-004-24R
- E = SMD0603-005-15R
- F = SMD0603-010-15R
- G = SMD0603-012-9R
- H = SMD0603-016-9R
- I = SMD0603-020-9R



Part Numbering System



Part Marking System



Example

- X = SMD0603-001-60R
- Y = SMD0603-002-60R
- Z = SMD0603-003-30R
- A = SMD0603-004-24R
- B = SMD0603-005-15R
- D = SMD0603-010-15R
- E = SMD0603-012-9R
- F = SMD0603-016-9R
- G = SMD0603-020-9R

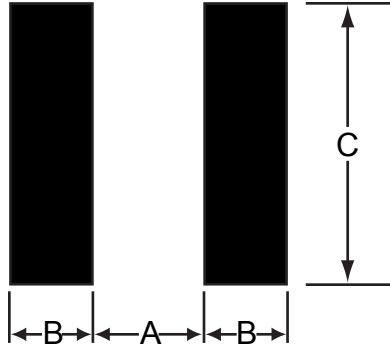
Standard Package

P/N	Reel/Tape
SMD0603-001-60R	4K
SMD0603-002-60R	4K
SMD0603-003-30R	4K
SMD0603-004-24R	4K
SMD0603-005-15R	4K
SMD0603-010-15R	4K
SMD0603-012-9R	4K
SMD0603-016-9R	4K
SMD0603-020-9R	4K

- 1- Operation beyond the specified maximum ratings or improper use may result in damage and possible electrical arcing and/or flame.
- 2 -PPTC device are intended for occasional overcurrent protection. Application for repeated overcurrent condition and/or prolonged trip are not anticipated.
- 3- Avoid contact of PPTC device with chemical solvent. Prolonged contact will damage the device performance.

Pad Layouts, Solder Reflow and Rework Recommendations

The dimension in the table below provide the recommended pad layout.



Pad dimensions (millimeters)			
Device	A	B	C
	Nominal	Nominal	Nominal
SMD0603 Series	0.80	0.60	0.80

Profile Feature	Pb-Free Assembly
Average Ramp-Up Rate (T_{smax} to T_p)	3°C / second max.
Preheat: Temperature Min (T _{smin}) Temperature Max (T _{smax}) Time (t _{smin} to t _{smax})	150°C 200°C 60-180 seconds
Time maintained above: Temperature (T _L) Time (t _L)	217°C 60-150 seconds
Peak / Classification Temperature (T_p):	260°C
Time within 5°C of actual peak: Temperature (t _p)	20-40 seconds
Ramp-Down Rate:	6°C / second max.
Time 25°C to Peak Temperature:	8 minutes max.

SOLDER REFLOW

Due to "Lead Free" nature, Temperature and Dwelling Time for the soldering zone is higher than those for Regular. This may cause damage to other components

1. Recommended maximum paste thickness > 0.25mm.
2. Devices can be cleaned using standard methods and aqueous solvents.
3. Rework use standard industry practices.
4. Storage Environment: <30°C / 60%RH

CAUTION:

1. If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.
2. Devices are not designed to be wave soldered to the bottom side of the board.

