SMD0603 Series

ROHS

Surface Mount Resettable PTCs

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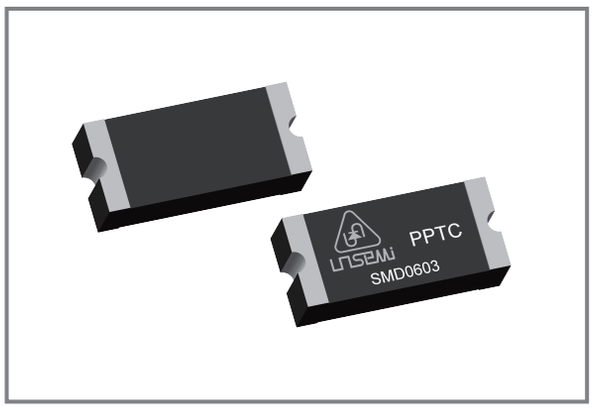
Description

The SMD0603 Series PTC provides surface mount over-current protection for applications where space is at a premium and reset table protection is desired.

Features

- RoHS compliant, Lead-Free and Halogen-Free
- Faster tripping, 0603 Dimension
- Compact design saves board space
- Compatible with high temperature solders
- Agency recognition: UL
- Low-profile



Applicable

- Battery PCM
- PDAs & Charger, Analog & digital line card
- Digital cameras
- General electronics
- USB peripherals
- Power ports

Electrical Parameters

Part Number	Marking	I_{hold} (A)	I_{trip} (A)	V max (Vdc)	I max (A)	Pdtyp. (W)	Maximum Time To Trip		Resistance	
							Current (A)	Time (Sec.)	R min (Ω)	R 1max (Ω)
SMD0603-002	X	0.02	0.06	30.0	40	0.50	0.20	1.00	12.0	70.00
SMD0603-003	-	0.03	0.09	30.0	20	0.50	0.15	1.00	6.00	65.00
SMD0603-004	-	0.04	0.12	24.0	20	0.50	0.20	1.00	4.00	45.00
SMD0603-005	1	0.05	0.15	24.0	20	0.50	0.25	1.00	3.00	35.00
SMD0603-010	1	0.10	0.30	15.0	40	0.50	0.50	1.00	0.90	8.00
SMD0603-020	2	0.20	0.50	9.0	40	0.50	1.00	0.60	0.55	3.50
SMD0603-025	2	0.25	0.55	9.0	40	0.50	8.00	0.08	0.50	3.00
SMD0603-030	3	0.30	0.70	6.0	40	0.50	8.00	0.10	0.30	2.00
SMD0603-035	3	0.35	0.75	6.0	40	0.50	8.00	0.10	0.20	1.40
SMD0603-040	5	0.40	0.80	6.0	40	0.50	8.00	0.10	0.20	0.90
SMD0603-050	5	0.50	1.00	6.0	40	0.50	8.00	0.10	0.10	0.80

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 (Imax)
I_{max}= Maximum fault current device can withstand without damage at rated voltage (Vmax)
$P_{dtyp.}$= 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_{max}= Maximum resistance of device in initial (un-soldered) state.
R_{1max}= Maximum resistance of device at 25°C measured one hour after tripping.

Temperature Rerating Chart – I hold (A)

Part Number	Ambient Operation Temperature								
	-40°C	-20°C	0°C	25°C	40°C	50°C	60°C	70°C	85°C
	Hold Current (A)								
SMD0603-002	0.028	0.025	0.023	0.020	0.017	0.014	0.012	0.010	0.007
SMD0603-003	0.042	0.038	0.035	0.030	0.026	0.021	0.018	0.015	0.011
SMD0603-004	0.056	0.050	0.046	0.040	0.034	0.028	0.024	0.020	0.014
SMD0603-005	0.070	0.063	0.058	0.050	0.043	0.035	0.030	0.025	0.018
SMD0603-010	0.140	0.125	0.115	0.100	0.085	0.070	0.060	0.050	0.035
SMD0603-020	0.280	0.250	0.230	0.200	0.170	0.140	0.120	0.100	0.070
SMD0603-025	0.350	0.310	0.290	0.250	0.210	0.180	0.150	0.130	0.090
SMD0603-030	0.420	0.380	0.350	0.300	0.260	0.210	0.180	0.150	0.110
SMD0603-035	0.470	0.440	0.390	0.350	0.300	0.270	0.240	0.200	0.140
SMD0603-040	0.540	0.500	0.450	0.400	0.340	0.310	0.270	0.230	0.160
SMD0603-050	0.670	0.630	0.560	0.500	0.430	0.390	0.340	0.290	0.200

Test Procedures and Requirement

Test Item	Test Conditions	Accept/Reject Criteria
Initial Resistance	In still air at 25°C	$R_{MIN} \le R \le R1_{MAX}$
Time to Trip	Specified current, V_{MAX}, 25°C	T ≤ Maximum Time to Trip
Hold Current	30min, at IH, 25°C	No trip
Trip Cycle Life	V_{MAX}, Imax, 100cycles	No arcing or burning
Trip Endurance	V_{MAX}, 1 hour	No arcing or burning

Physical Characteristics

Terminal Materials	Tin-Plated Nickle-copper
Soldering Zone	Meets EIA specification RS 186-9E and ANSI/J-STD-002 Category 3.

Environmental Specifications

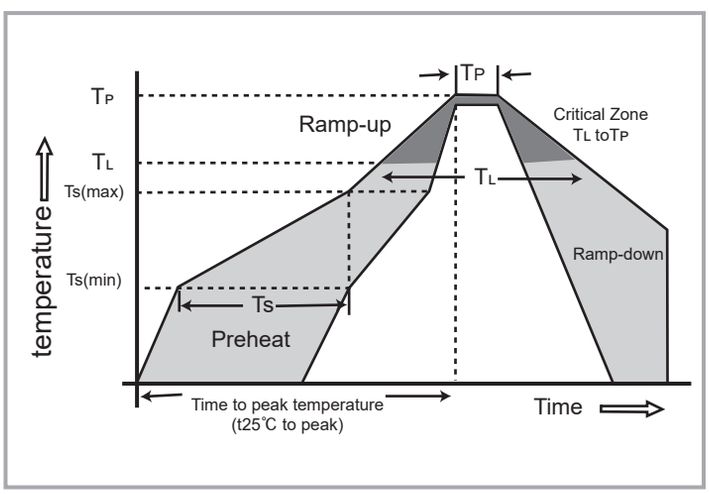
Test Item	Test Conditions	Resistance Change
Passive Aging	85°C ,1000 hours	±10% typical
Humidity Aging	85°C/85%RH.1000 hours	±5% typical
Thermal Shock	MIL-STD-202,Method 107G +85 °C/-40°C ,20 times	-30% typical
Solvent Resistance	MIL-STD-202,Method 215	No change
Vibration	ML-STD-883C,Test Condition A	No change

Part Numbering System

SMD 0603 – XXX / X

- X: Max Voltage Rating
- XXX: Holding current Rating
- 0603: 0603 Package
- SMD: SMD

Soldering Parameters



- ◆ Recommended reflow methods: IR, vapor phase oven, hot air oven, N2 environment for lead-free.
- ◆ Devices are not designed to be wave soldered to the bottom side of the board.
- ◆ Recommended maximum paste thickness is 0.25mm(0.010inch).
- ◆ Devices can be cleaned using standard industry methods and solvents.
- ◆ Soldering temperature profile meets RoHs lead free process.
  Notes: If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements

Reflow Condition		Lead–free assembly
Pre Heat	-Temperature Min (Ts(min))	150°C
	-Temperature Max (Ts(max))	200°C
	- Time (min to max) (Ts)	60 -120 Seconds
Average ramp up rate (Liquidus Temp TL) to peak		3°C/second max
Ts(max) to TL - Ramp-up Rate		3°C/second max
Reflow	- Temperature (TL) (Liquidus)	217°C
	- Time (min to max) (Ts)	60 -150 Seconds
Peak Temperature (TP)		260 +0/-5°C
Time within 5°C of actual peak Temperature (TP)		30 Seconds
Ramp-down Rate		3°C/second max
Time 25°C to peak Temperature (TP)		8 minutes Max
Do not exceed		260°C

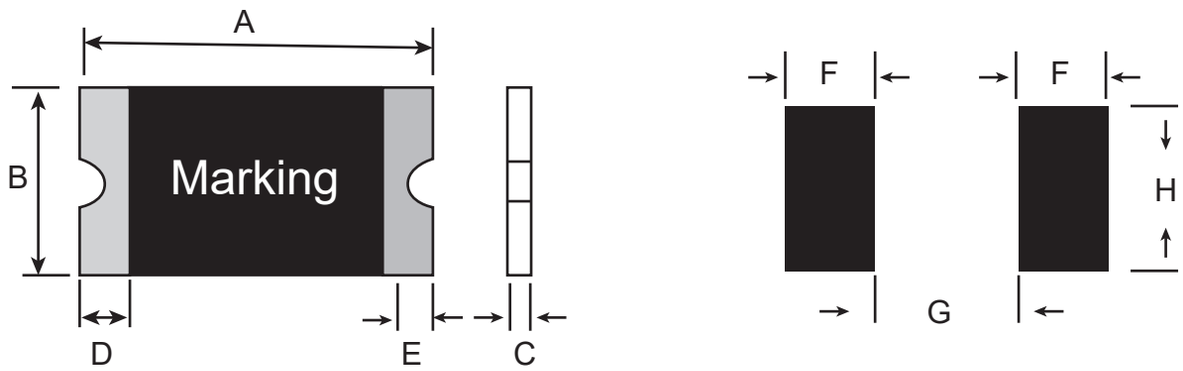
Caution:

1、If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements

2、Operation beyond the specified rating may result in damage and possible arcing and flame.

3、PPTC are intended for protection against occasional over current or over temperature fault conditions and should not be used when repeated fault conditions or prolonged trip events are anticipated.

Dimensions Unit: mm



Part Number	A		B		C		D	E
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
SMD0603-002	1.45	1.85	0.65	1.05	0.40	1.00	0.15	0.40
SMD0603-003	1.45	1.85	0.65	1.05	0.40	0.90	0.15	0.40
SMD0603-004	1.45	1.85	0.65	1.05	0.40	0.90	0.15	0.40
SMD0603-005	1.45	1.85	0.65	1.05	0.40	0.75	0.15	0.40
SMD0603-010	1.45	1.85	0.65	1.05	0.40	0.75	0.15	0.40
SMD0603-020	1.45	1.85	0.65	1.05	0.40	0.75	0.15	0.40
SMD0603-025	1.45	1.85	0.65	1.05	0.40	0.75	0.15	0.40
SMD0603-030	1.45	1.85	0.65	1.05	0.40	0.75	0.15	0.40
SMD0603-035	1.45	1.85	0.65	1.05	0.40	0.75	0.15	0.40
SMD0603-040	1.45	1.85	0.65	1.05	0.50	1.20	0.15	0.40
SMD0603-050	1.45	1.85	0.65	1.05	0.50	1.20	0.15	0.40

Layout Dimensions Unit: mm

Part Number	F	G	H
	Normal Value	Normal Value	Normal Value
SMD0603 Series	1.0±0.1	0.8±0.1	1.0±0.1

Ordering Information

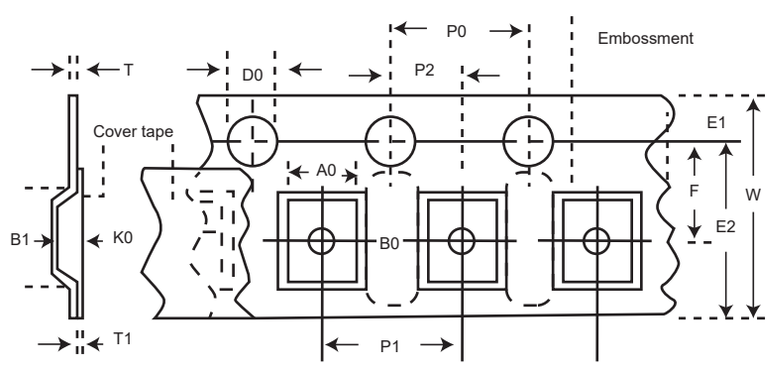
Part Number	Quantity
SMD0603-002	4,000 pcs/Reel
SMD0603-003	5,000 pcs/Reel
SMD0603-004	5,000 pcs/Reel
SMD0603-005	5,000 pcs/Reel
SMD0603-010	5,000 pcs/Reel
SMD0603-020	5,000 pcs/Reel
SMD0603-025	5,000 pcs/Reel
SMD0603-030	5,000 pcs/Reel
SMD0603-035	5,000 pcs/Reel
SMD0603-040	4,000 pcs/Reel
SMD0603-050	4,000 pcs/Reel

Tape Specification and Reel Specifications

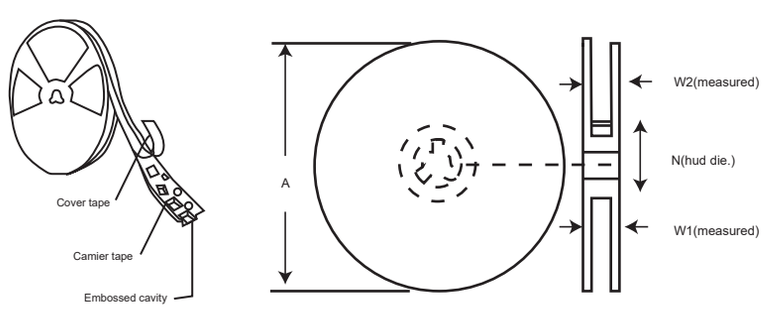
Coverning Specifications EIA 481-1(Unit:mm)	
W	8.00±0.10
P0	4.00±0.10
P1	4.00±0.10
P2	2.00±0.05
A0	0.95±0.10
B0	1.85±0.10
D0	1.55±0.05
F	3.50±0.05
E1	1.75±0.10
T	0.20±0.02
Leader min.	390
Traile min.	160

Reel Dimensions	
A	178±1.0
N	59±1.0
W1	8.5 + 1.0/-0.2
W2	12.0±1.0

ELA Tape Component Dimentions



EIA Reel Dimentions



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