

# SMD0603L Series

ROHS

## Surface Mount Resettable PTCs

### Description

The SMD0603L Series PTC provides surface mount over-current protection for applications where space is at a premium and resettable protection is desired.

### Features

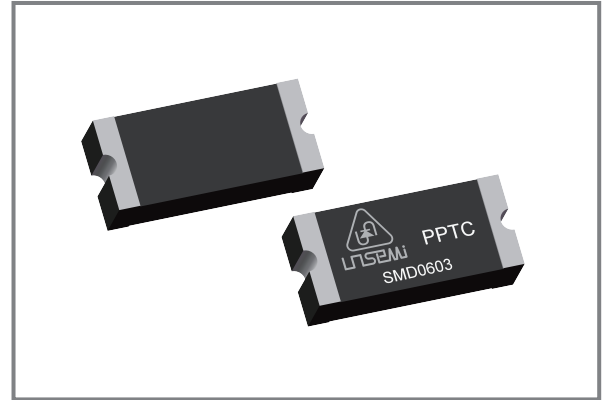
- ◆ RoHS compliant, Lead-Free and Halogen-Free
- ◆ Faster tripping, 0603L Dimension
- ◆ Compact design saves board space
- ◆ Compatible with high temperature solders
- ◆ Agency recognition: UL
- ◆ Low-profile

### Applicable

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



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### 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)
SMD0603-035L	D	0.35	0.7	6.0	50.0	0.5	8.0	0.1	0.150	1.00
SMD0603-050L	D	0.50	1.0	6.0	50.0	0.5	8.0	0.6	0.070	0.40
SMD0603-075L	D	0.75	1.5	6.0	50.0	0.5	8.0	1.0	0.055	0.25
SMD0603-100L	B	1.00	2.0	6.0	50.0	0.5	8.0	2.0	0.045	0.12
SMD0603-125L	B	1.25	2.5	6.0	50.0	0.5	8.0	3.0	0.035	0.10
SMD0603-150L	C	1.50	3.0	6.0	50.0	0.5	8.0	4.0	0.025	0.08
SMD0603-175L	C	1.75	3.5	6.0	50.0	0.5	8.0	5.0	0.015	0.07
SMD0603-200L	C	2.00	4.0	6.0	50.0	0.5	8.0	5.0	0.012	0.06
SMD0603-260L	E	2.60	5.2	6.0	50.0	0.5	8.0	5.0	0.008	0.05
SMD0603-300L	E	3.00	6.0	6.0	50.0	0.5	8.0	5.0	0.008	0.04

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<sub>max</sub>)

I max= Maximum fault current device can withstand without damage at rated voltage (V<sub>max</sub>)

Pdtyp.= 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 Derating 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)								
SMD0603-035L	0.46	0.40	0.37	0.35	0.29	0.25	0.24	0.20	0.14
SMD0603-050L	0.66	0.57	0.53	0.50	0.41	0.36	0.34	0.29	0.20
SMD0603-075L	0.99	0.86	0.79	0.75	0.62	0.54	0.51	0.43	0.30
SMD0603-100L	1.31	1.14	1.06	1.00	0.83	0.71	0.69	0.57	0.40
SMD0603-125L	1.64	1.43	1.32	1.25	1.04	0.89	0.86	0.71	0.50
SMD0603-150L	1.97	1.71	1.59	1.50	1.24	1.07	1.03	0.86	0.60
SMD0603-175L	2.30	2.00	1.85	1.75	1.45	1.25	1.20	1.00	0.70
SMD0603-200L	2.63	2.29	2.11	2.00	1.66	1.43	1.37	1.14	0.80
SMD0603-260L	3.42	2.97	2.75	2.60	2.15	1.86	1.78	1.49	1.04
SMD0603-300L	3.94	3.43	3.17	3.00	2.49	2.14	2.06	1.71	1.20

### Test Procedures and Requirement

Test Item	Test Conditions	Accept/Reject Criteria
Initial Resistance	In still air at 25C±2°C	$R_{MIN} \leq R \leq R_{1MAX}$
Time to Trip	Specified current, $V_{MAX}$ , 25°C±2°C	$T \leq$ Maximum Time to Trip
Hold Current	30min, at $I_H$ , 25°C±2°C	No trip
Trip Endurance	$V_{MAX}$ , 1 hour	No arcing or burning

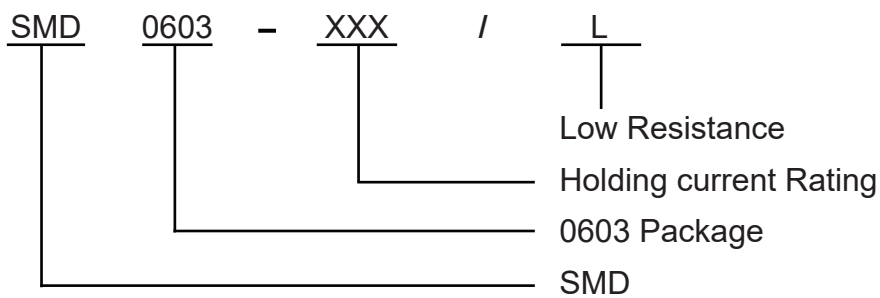
### Physical Characteristics

Terminal Materials	Tin-Plated Nickel-copper
Soldering Zone	Meets EIA specification RS 186-9E and ANSI/J-STD-002 Category 3.
Moisture Sensitivity	Level 2a, per IPC/JEDEC J-STD 020C

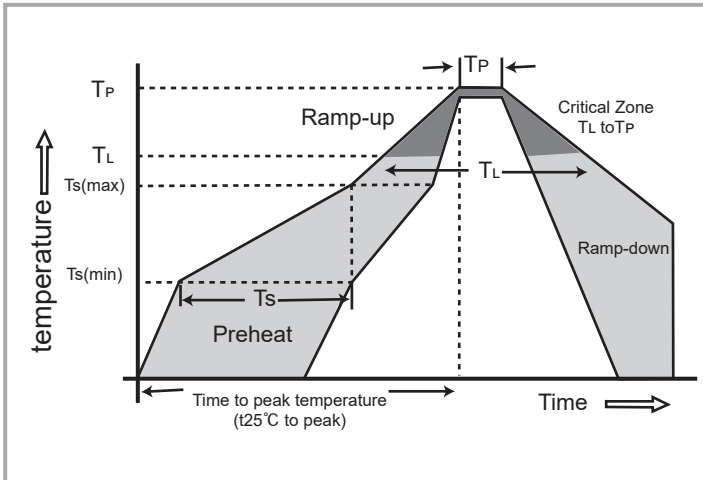
### Environmental Specifications

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



## Soldering Parameters



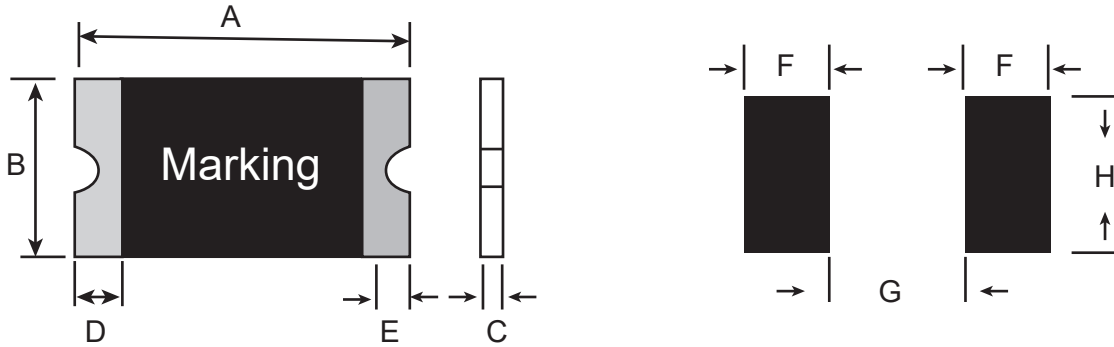
- ◆ Recommended reflow methods: IR, vapor phase oven, hot air oven, N2 environment for lead-free.
- ◆ Devices are not designed to be wave soldered to the bottom side of the board.
- ◆ Recommended maximum paste thickness is 0.25mm(0.010inch).
- ◆ Devices can be cleaned using standard industry methods 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 ( $T_S(\min)$ )	150°C
	-Temperature Max ( $T_S(\max)$ )	200°C
	- Time (min to max) ( $T_S$ )	60 -120 Seconds
Average ramp up rate ( Liquidus Temp $T_L$ ) to peak		3°C/second max
$T_S(\max)$ to $T_L$ - Ramp-up Rate		3°C/second max
Reflow	- Temperature ( $T_L$ ) (Liquidus)	217°C
	- Time (min to max) ( $T_S$ )	60 -150 Seconds
Peak Temperature ( $T_P$ )		260 +0/-5°C
Time within 5°C of actual peak Temperature ( $T_P$ )		30 Seconds
Ramp-down Rate		3°C/second max
Time 25°C to peak Temperature ( $T_P$ )		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.
SMD0603-035L	1.45	1.85	0.65	1.05	0.3	0.7	0.15	0.1
SMD0603-050L	1.45	1.85	0.65	1.05	0.3	0.7	0.15	0.1
SMD0603-075L	1.45	1.85	0.65	1.05	0.3	0.7	0.15	0.1
SMD0603-100L	1.45	1.85	0.65	1.05	0.4	1.0	0.15	0.1
SMD0603-125L	1.45	1.85	0.65	1.05	0.4	1.0	0.15	0.1
SMD0603-150L	1.45	1.85	0.65	1.05	0.5	1.2	0.15	0.1
SMD0603-175L	1.45	1.85	0.65	1.05	0.5	1.2	0.15	0.1
SMD0603-200L	1.45	1.85	0.65	1.05	0.7	1.4	0.15	0.1
SMD0603-260L	1.45	1.85	0.65	1.05	0.7	1.4	0.15	0.1
SMD0603-300L	1.45	1.85	0.65	1.05	0.7	1.4	0.15	0.1

**Layout Dimensions Unit: mm**

Part Number	F	G	H
	Normal Value	Normal Value	Normal Value
SMD0603L Series	1.0 ± 0.1	0.8 ± 0.1	1.0 ± 0.1

**Ordering Information**

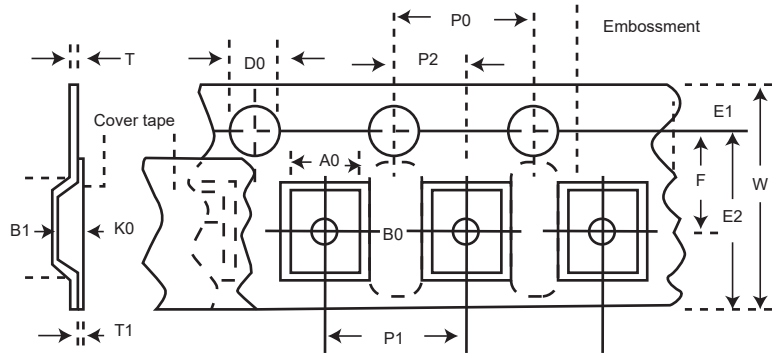
Part Number	Quantity	Part Number	Quantity
SMD0603-035L	5,000 pcs/Reel	SMD0603-150L	4,000 pcs/Reel
SMD0603-050L	5,000 pcs/Reel	SMD0603-175L	4,000 pcs/Reel
SMD0603-075L	5,000 pcs/Reel	SMD0603-200L	4,000 pcs/Reel
SMD0603-100L	5,000 pcs/Reel	SMD0603-260L	4,000 pcs/Reel
SMD0603-125L	5,000 pcs/Reel	SMD0603-300L	4,000 pcs/Reel

**Tape Specification and Reel Specifications**

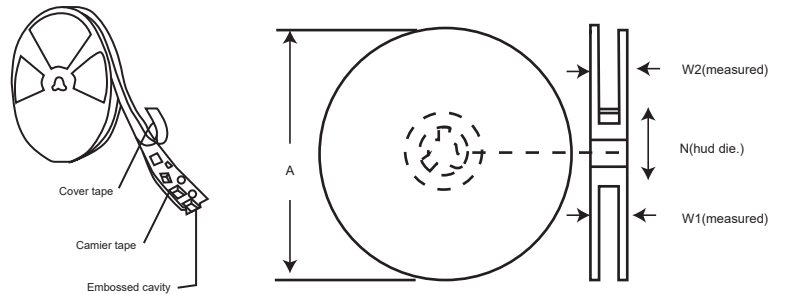
Covering Specifications EIA 481-1(Unit:mm)	
W	8.00±0.10
P0	4.00±0.10
P1	4.00±0.10
P2	2.00±0.05
A0	0.95±0.10
B0	1.85±0.10
D0	1.55±0.05
F	3.50±0.05
E1	1.75±0.10
T	0.20±0.02
Leader min.	390
Trailer min.	160

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 Dimensions**



**EIA Reel Dimensions**



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