



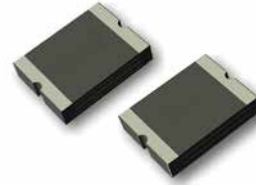
Positive Thermal Coefficient

SMD0603 Series

Positive Thermal Coefficient - SMD0603 Series

Description

The 0603 series provides miniature surface mount resettable overcurrent protection with holding current from 0.05A to 1.00A. This world's smallest PTC is suitable for ultra portable applications where space is at a premium and the device current is low.



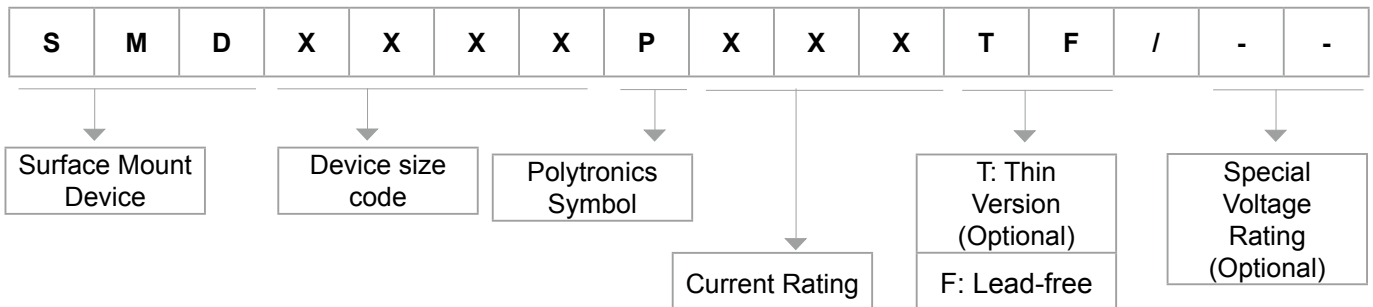
Features

- I(hold): 0.05~1.00A
- Very high voltage surge capabilities
- Available in lead-free version
- Fast response to fault current
- RoHS compliant, Lead- Free and Halogen-Free
- Low resistance
- Compact design saves board space
- Compatible with high temperature solders

Applications

- USB peripherals
- Disk drives
- CD-ROMs
- General electronics
- Disk drives
- Set-top-box and HDMI
- Mobile Internet Device (MID)
- PDAs / digital cameras
- Game console port protection
- Plug and play protection for motherboards and peripherals
- Mobile phones - battery and port protection

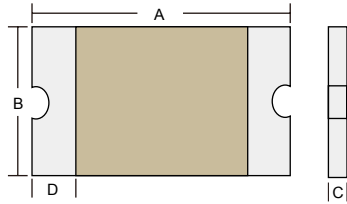
Product Name



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Lead style code

Dimensions (mm)



Type Number	I _{hold}	I _{trip}	Maximum Time To Trip		V _{max}	I _{max}	P _{d typ}	R _{min}	R _{1max}	Package	Package Dimensions (mm)						
			Current A	Time (Sec.)							A		B		C		D
	A	A	A	(Sec.)	V _{DC}	A	W	Ω	Ω	min	max	min	max	min	max		
SMD0603P005TF	0.05	0.2	0.5	1	15	40	0.5	2	10	0603	1.45	1.85	0.65	1.05	0.4	1	0.1
SMD0603P010TF	0.1	0.3	0.5	1	16	40	0.5	0.9	6	0603	1.45	1.85	0.65	1.05	0.4	1	0.1
SMD0603P020TF	0.2	0.5	1	0.6	9	40	0.5	0.55	3.5	0603	1.45	1.85	0.65	1.05	0.4	1	0.1
SMD0603P020TF/16	0.2	0.5	1	0.6	16	40	0.5	0.55	3.5	0603	1.45	1.85	0.65	1.05	0.4	1	0.1
SMD0603P025TF	0.25	0.55	8	0.08	9	40	0.5	0.5	3	0603	1.45	1.85	0.65	1.05	0.4	1	0.1
SMD0603P025TF/16	0.25	0.55	8	0.08	16	40	0.5	0.5	3	0603	1.45	1.85	0.65	1.05	0.4	1	0.1
SMD0603P035TF	0.35	0.75	8	0.1	6	40	0.5	0.2	1.4	0603	1.45	1.85	0.65	1.05	0.4	1	0.1
SMD0603P050TF	0.5	1	8	0.1	6	40	0.5	0.1	0.8	0603	1.45	1.85	0.65	1.05	0.5	1.1	0.1
SMD0603P050TF/12	0.5	1	8	0.1	12	40	0.5	0.1	0.8	0603	1.45	1.85	0.65	1.05	0.5	1.1	0.1
SMD0603P075TF	0.75	1.4	8	0.1	6	40	0.5	0.06	0.45	0603	1.45	1.85	0.65	1.05	0.5	1.1	0.1
SMD0603P100TF	1.0	2.0	8	0.1	6	40	0.5	0.04	0.3	0603	1.45	1.85	0.65	1.05	0.5	1.1	0.1

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.

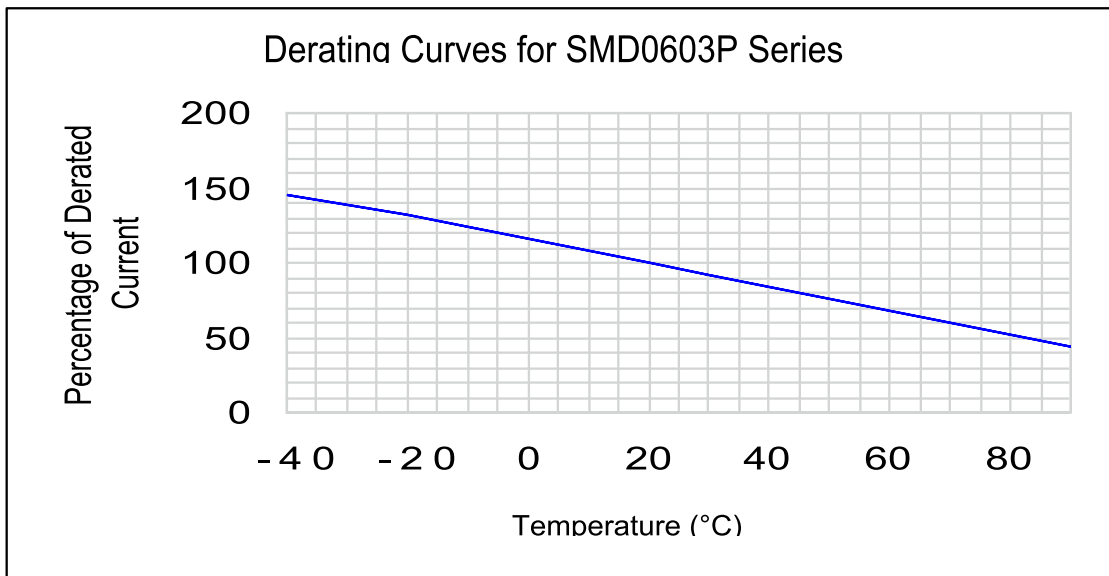
R_{1max} = Maximum resistance of device at 25 °C measured one hour after tripping or reflow soldering of 260 °C for 20 sec.

Positive Thermal Coefficient - SMD0603 Series

Thermal Derating Chart Recommended Hold Current (A) at Ambient Temperature (°C)

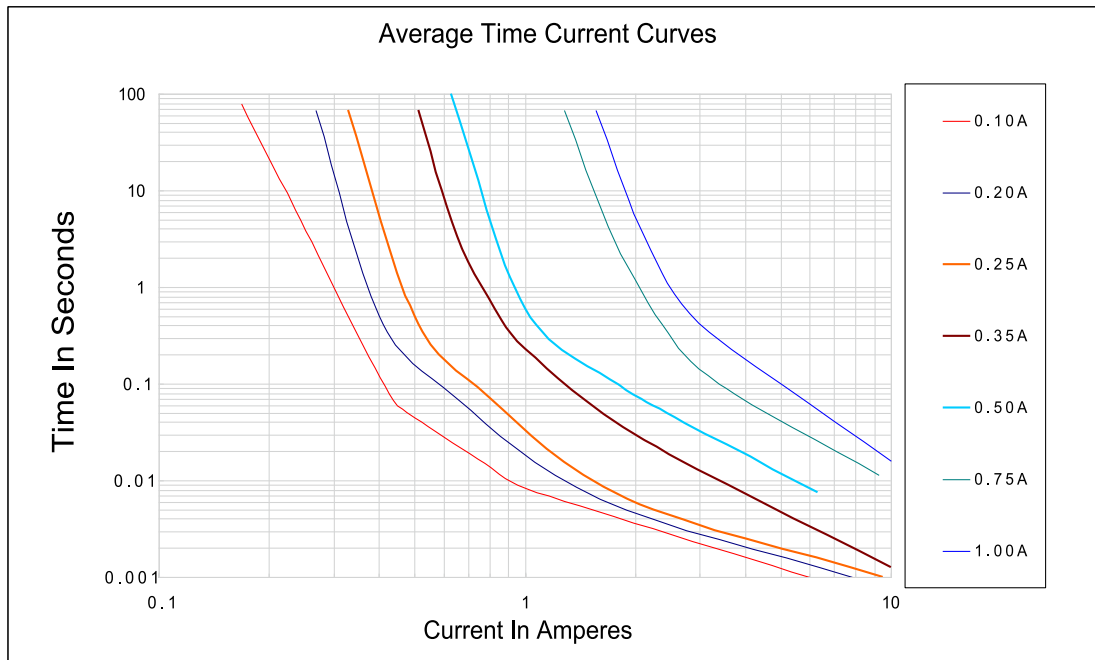
Part Number	-40°C	-20°C	0°C	25°C	40°C	50 °C	60°C	70°C	85°C
SMD0603P005TF	0.10	0.28	0.10	0.05	0.06	0.048	0.040	0.031	0.028
SMD0603P010TF	0.14	0.12	0.11	0.10	0.08	0.07	0.06	0.05	0.03
SMD0603P020TF	0.27	0.25	0.23	0.20	0.17	0.14	0.12	0.10	0.07
SMD0603P020TF/16	0.27	0.25	0.23	0.20	0.17	0.14	0.12	0.10	0.07
SMD0603P025TF	0.32	0.29	0.27	0.25	0.21	0.18	0.16	0.14	0.10
SMD0603P025TF/16	0.32	0.29	0.27	0.25	0.21	0.18	0.16	0.14	0.10
SMD0603P035TF	0.47	0.41	0.38	0.35	0.29	0.26	0.24	0.20	0.14
SMD0603P050TF	0.68	0.59	0.54	0.50	0.41	0.37	0.34	0.29	0.20
SMD0603P050TF/12	0.68	0.59	0.54	0.50	0.41	0.37	0.34	0.29	0.20
SMD0603P075TF	1.00	0.90	0.79	0.75	0.63	0.57	0.53	0.41	0.34
SMD0603P100TF	1.30	1.12	1.08	1.00	0.80	0.72	0.58	0.53	0.42

Thermal Derating Curve



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Average Time-Current Curve



Environmental Specifications

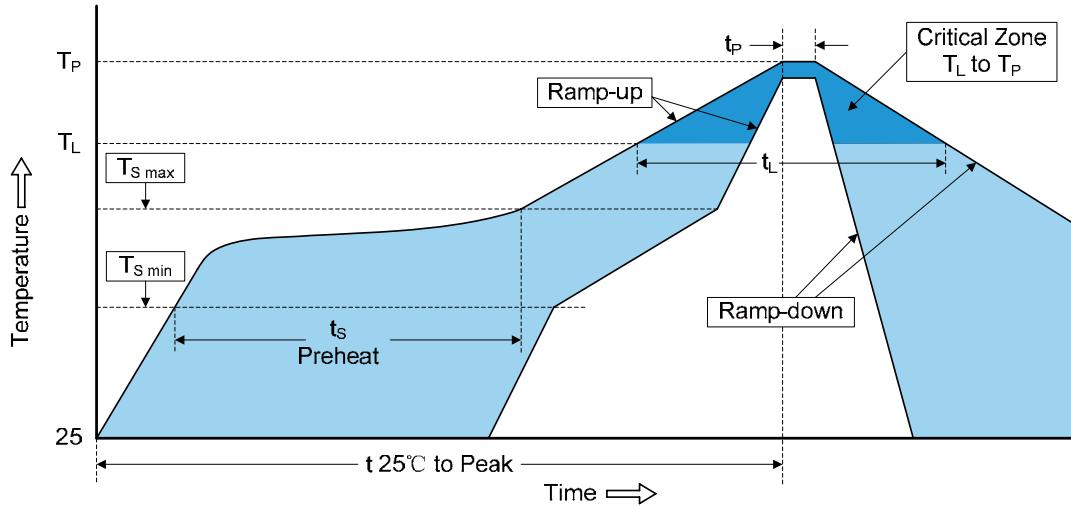
Test	Conditions	Resistance change
Passive aging	+85°C, 1000 hrs.	±5% typical
Humidity aging	+85°C, 85% R.H. , 168 hours	±5% typical
Thermal shock	+85°C to -40°C, 20 times	±33% typical
Resistance to solvent	MIL-STD-202, Method 215	No change
Vibration	MIL-STD-202, Method 201	No change

Ambient operating conditions : - 40 °C to +85 °C

Maximum surface temperature of the device in the tripped state is 125 °C

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Soldering Parameters



Profile Feature	Pb-Free Assembly
Average ramp-up rate ($T_{S\ max}$ to T_P)	3°C/second max.
Preheat -Temperature Min ($T_{S\ min}$) -Temperature Max ($T_{S\ max}$) -Time (min to max) ($T_{S\ min}$ to $T_{S\ max}$)	150°C 200°C 60-180 seconds
Time maintained above: -Temperature (T_L) -Time (t_L)	217°C 60-150 seconds
Peak 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.
Storage Condition	0°C ~ 35°C, ≤70%RH

- Recommended reflow methods: IR, vapor phase oven, hot air oven, N₂ environment for lead-free
- Recommended maximum paste thickness is 0.25mm (0.010 inch)
- Device can be cleaned using standard industry methods and solvents.

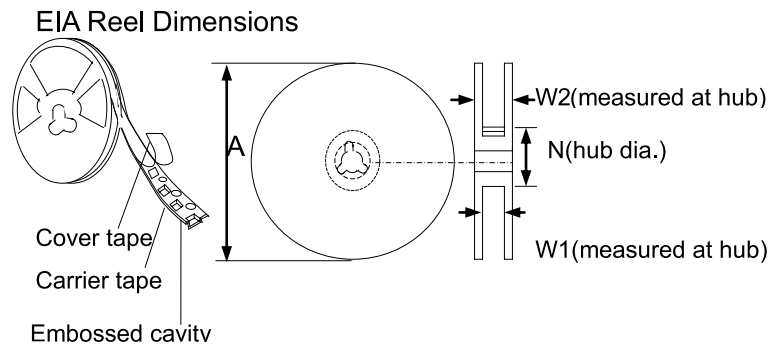
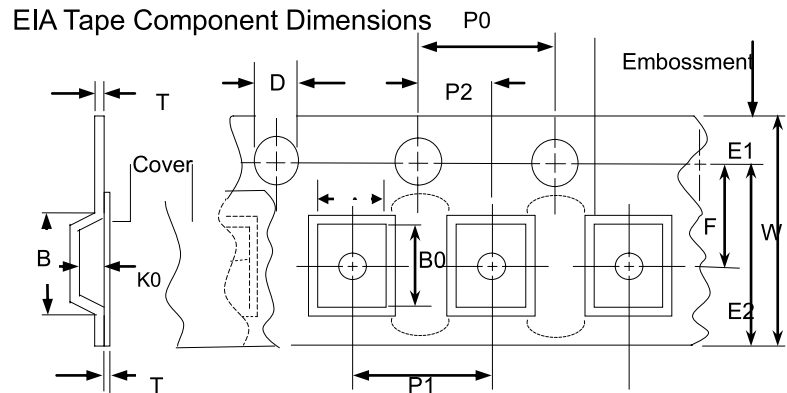
Note 1: All temperature refer to topside of the package, measured on the package body surface.

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

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Tape and Reel Specifications

Governing Specifications	EIA 481-1
W	8.0 ± 0.3
P0	4.0 ± 0.10
P1	4.0 ± 0.10
P2	2.0 ± 0.05
A0	1.05 ± 0.10
B0	1.85 ± 0.10
B1max.	4.35
D0	1.55 ± 0.05
F	3.5 ± 0.05
E1	1.75 ± 0.10
E2min.	6.25
T	0.6
T1max.	0.75
K0	0.75 ± 0.1
Leader min.	390
Trailer min.	160
Reel Dimensions	
A max.	178
N min.	60
W1	9 ± 0.5
W2	12.6 ± 0.5



Packaging

Part Number	Halogen Free	Packaging Option	Quantity	Quantity & Packaging Codes
SMD0603PxxxTF	Yes	Tape and Reel	4000	YR

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