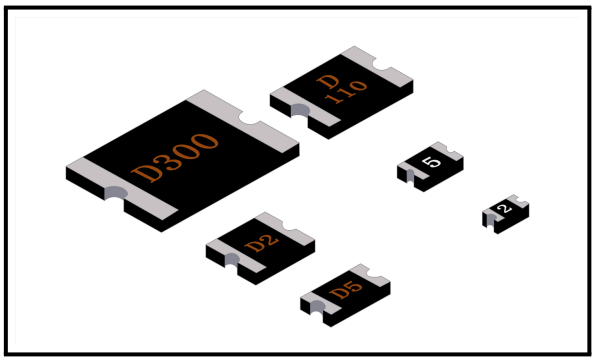
SMD0603 Series

SMD0603 Polymer PPTC

Features

- RoHS compliant and lead-free
- Halogen-free
- Fast reponse to flault current
- Symmetrical design

Package



Applications

- Li-ion/Li-Polymer battery packs
- PDA'S / digital cameras
- Computer peripherals
- PC motherboards-plug and play protection

Part Numbering

SMD 0603 XXX /XX

- /XX — Special Voltage Rating(Optional)
- XXX — Holding Current Rating
- 0603 — Size 0603 inch
- SMD — SMD

Environmental Specifications

Operating Temperature	-40°C to +85°C
Maximum Device Surface Temperature in Tripped State	125°C
Passive Aging	+85°C, 1000 hours; ±5% typical resistance change
Humidity Aging	+85°C, 85% R.H.1000 hours; ±5% typical resistance change
Thermal Shock	MIL-STD-202, Method 107; +85°C to -40°C, 20 times; -30% typical resistance change
Solvent Resistance	MIL-STD-202, Method 215; No change
Vibration	MIL-STD-883, Method 2007, Condition A; No change
Moisture Sensivity Level	Level 1, J-STD-020
Storage Conditions	+40°C Max.70% RH Max. Packed in original packaging.

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SMD0603 Series

SMD0603 Polymer PPTC

Electrical Characteristics

Part Number	Marking	I_{hold}	I_{trip}	V_{max}	I_{max}	$P_{dtyp.}$	Maximum Time To Trip		R0min	R1max
		(A)	(A)	(V_{dc})	(A)	(W)	Current(A)	Time(Sec.)	(ohm)	(ohm)
SMD0603-001/60N	-	0.01	0.06	60.00	40.00	0.50	0.20	1.00	15.00	100.00
SMD0603-001/72N	-	0.01	0.06	72.00	20.00	0.50	0.20	1.00	15.00	100.00
SMD0603-002/60N	Y	0.02	0.08	60.00	40.00	0.50	0.20	1.00	12.00	70.00
SMD0603-003/30N	-	0.03	0.12	30.00	40.00	0.50	0.20	1.00	6.00	50.00
SMD0603-003/60N	-	0.03	0.12	60.00	40.00	0.50	0.20	1.00	6.00	50.00
SMD0603-004/24N	-	0.04	0.12	24.00	40.00	0.50	0.20	1.00	4.00	40.00
SMD0603-004/30N	-	0.04	0.12	30.00	40.00	0.50	0.20	1.00	4.00	40.00
SMD0603-004/48N	-	0.04	0.12	48.00	40.00	0.50	0.20	1.00	4.00	40.00
SMD0603-005/24N	C	0.05	0.15	24.00	40.00	0.50	0.20	1.00	3.50	40.00
SMD0603-005/30N	C	0.05	0.15	30.00	40.00	0.50	0.20	1.00	3.50	40.00
SMD0603-005/48N	C	0.05	0.15	48.00	40.00	0.50	0.20	1.00	3.50	40.00
SMD0603-008/30N	V	0.08	0.165	30.00	40.00	0.50	0.20	1.00	4.00	20.00
SMD0603-010/15N	1	0.10	0.30	15.00	40.00	0.50	0.50	1.00	0.90	6.00
SMD0603-010/24N	1	0.10	0.30	24.00	40.00	0.50	0.50	1.00	0.90	6.00
SMD0603-010/33N	1	0.10	0.30	33.00	40.00	0.50	0.50	1.00	0.90	8.00
SMD0603-010/36N	1	0.10	0.30	36.00	40.00	0.50	0.50	1.00	0.90	8.00
SMD0603-016/33N	1	0.16	0.40	33.00	40.00	0.50	0.50	1.00	0.80	6.00
SMD0603-016/36N	1	0.16	0.40	36.00	40.00	0.50	0.50	1.00	0.80	6.00
SMD0603-020/9N	2	0.20	0.50	9.00	40.00	0.50	1.00	0.60	0.55	3.50
SMD0603-020/16N	2	0.20	0.50	16.00	40.00	0.50	1.00	0.60	0.55	3.50
SMD0603-020/24N	2	0.20	0.50	24.00	40.00	0.50	1.00	0.60	0.55	4.00
SMD0603-020/30N	2	0.20	0.50	30.00	40.00	0.50	1.00	0.60	0.55	4.00
SMD0603-025/9N	2	0.25	0.50	9.00	40.00	0.50	1.00	0.60	0.50	3.00
SMD0603-025/16N	2	0.25	0.50	16.00	40.00	0.50	1.00	0.60	0.50	3.00
SMD0603-025/24N	2	0.25	0.50	24.00	40.00	0.50	1.00	0.60	0.50	3.50

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SMD0603 Series

SMD0603 Polymer PPTC

Electrical Characteristics

Part Number	Marking	I_{hold}	I_{trip}	V_{max}	I_{max}	$P_{dtyp.}$	Maximum Time To Trip		R0min	R1max
		(A)	(A)	(V_{dc})	(A)	(W)	Current(A)	Time(Sec.)	(ohm)	(ohm)
SMD0603-035/6N	3	0.35	0.70	6.00	40.00	0.50	8.00	0.10	0.20	1.40
SMD0603-035/9N	3	0.35	0.70	9.00	40.00	0.50	8.00	0.10	0.20	1.40
SMD0603-035/16N	3	0.35	0.70	16.00	40.00	0.50	8.00	0.10	0.20	1.40
SMD0603-040/6N	4	0.40	0.80	6.00	40.00	0.50	8.00	0.10	0.15	0.90
SMD0603-040/12N	4	0.40	0.80	12.00	40.00	0.50	8.00	0.10	0.15	0.90
SMD0603-040/16N	4	0.40	0.80	16.00	40.00	0.50	8.00	0.10	0.15	0.90
SMD0603-050/6N	5	0.50	1.00	6.00	40.00	0.50	8.00	0.10	0.10	0.80
SMD0603-050/12N	5	0.50	1.00	12.00	40.00	0.50	8.00	0.10	0.10	0.80
SMD0603-050/16N	5	0.50	1.00	16.00	40.00	0.50	8.00	0.10	0.10	0.80
SMD0603-075/6N	7	0.75	1.50	6.00	40.00	0.50	8.00	0.10	0.06	0.45

I_{hold} : Holding Current: maximum current at which the device will not trip in 25°C still air.

I_{trip} : Tripping Current: minimum current at which the device will trip in 25° 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}).

$P_{dtyp.}$: Typical power dissipated from device when in the tripped state at 25°Cstill air.

R_{0min} : 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.

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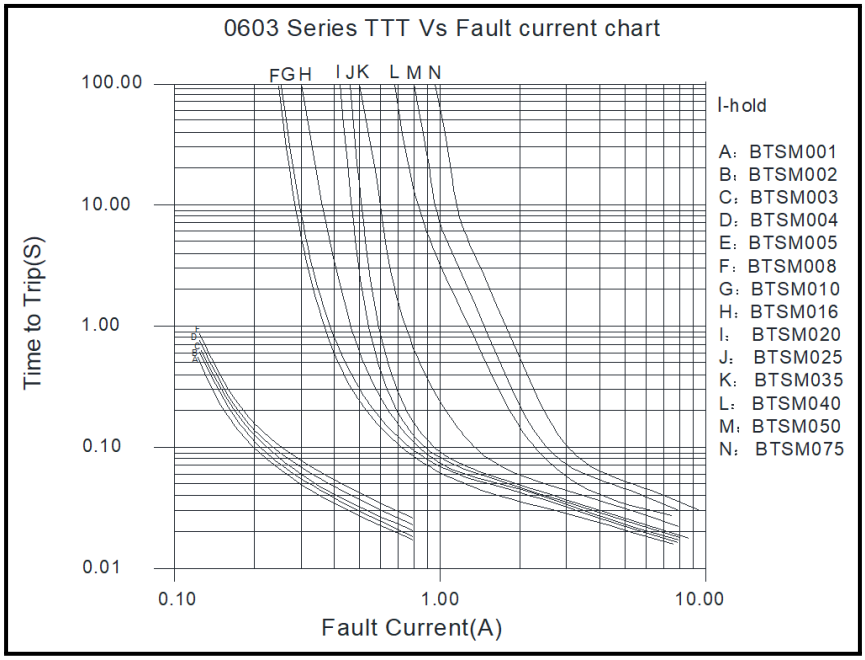
SMD0603 Series

SMD0603 Polymer PPTC

Thermal Derating Chart

Part Number	Ambient Operating Temperature								
	-40°C	-20°C	0°C	25°C	40°C	50°C	60°C	70°C	85°C
SMD0603-001N	0.016	0.014	0.012	0.010	0.008	0.007	0.006	0.005	0.0035
SMD0603-002N	0.031	0.027	0.024	0.020	0.016	0.014	0.012	0.011	0.007
SMD0603-003N	0.047	0.041	0.036	0.030	0.024	0.021	0.018	0.016	0.010
SMD0603-004N	0.050	0.048	0.044	0.040	0.033	0.030	0.025	0.020	0.012
SMD0603-005N	0.065	0.060	0.055	0.050	0.040	0.035	0.030	0.025	0.015
SMD0603-008N	0.104	0.096	0.088	0.080	0.064	0.056	0.048	0.040	0.024
SMD0603-010N	0.13	0.12	0.11	0.10	0.08	0.07	0.06	0.05	0.03
SMD0603-016N	0.21	0.19	0.18	0.16	0.13	0.11	0.10	0.08	0.05
SMD0603-020N	0.27	0.25	0.23	0.20	0.17	0.14	0.12	0.10	0.07
SMD0603-025N	0.32	0.29	0.27	0.25	0.21	0.18	0.16	0.14	0.10
SMD0603-035N	0.47	0.41	0.38	0.35	0.29	0.26	0.24	0.20	0.14
SMD0603-040N	0.54	0.47	0.43	0.40	0.33	0.30	0.27	0.23	0.16
SMD0603-050N	0.67	0.59	0.54	0.50	0.41	0.37	0.34	0.29	0.20
SMD0603-075N	0.98	0.85	0.81	0.75	0.60	0.54	0.44	0.40	0.31

0603 Series TTT Vs Fault current chart(Typical time to trip at 25°C)



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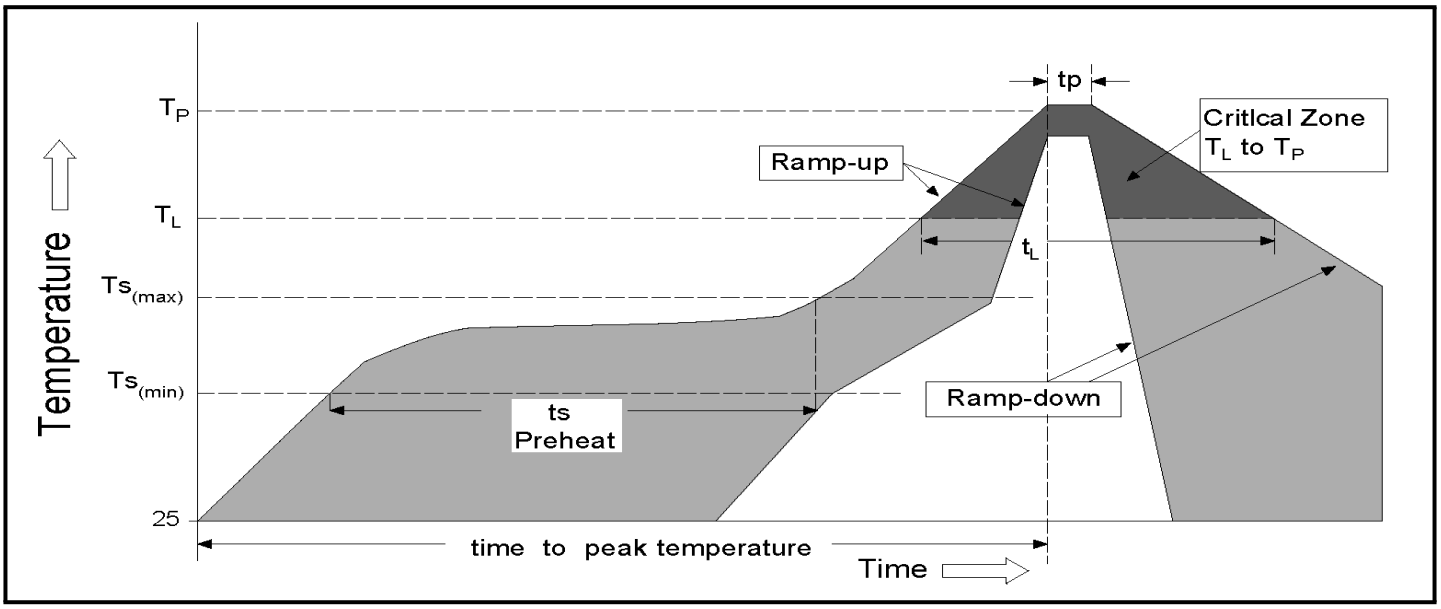
SMD0603 Series

Soldering Parameters



Profile Feature		Pb-Free Assembly
Average Ramp-Up Rate ($T_{S(max)}$ toT_P)		3°C/second max
Pre Heat	Temperature Min (T_S(min))	150°C
	Temperature Max (T_S(max))	200°C
	Time (min to max) (t_S)	60 - 180 secs
Time Maintained Above	Temperature (T_L)	217°C
	Temperature (t_L)	60 -150 secs
Peak/Classification Temperature (T_P)		$260^{+0/-5}$°C
Time within 5°C of actual peak Temperature (t_p)		20-40 second
Ramp-down Rate		6°C/second max
Time 25°C to peak Temperature (T_P)		8 minutes Max.

- All temperature refer to topside of thepackage, measured on the package body surface
- If reflow temperature exceeds the recommended profile, devices may not meet the performance requirements
- Recommended reflow methods: IR, vapor phase oven, hot air oven„N2 environment for lead
- Recommended maximum paste thickness is 0.25mm (0.010inch)
- Devices can be cleaned using standard industry methods and solvents

Test Procedures And Requirements

Test	Test Conditions	Accept/Reject Criteria
R0 min	Resistance measurement at 25°C	$R0_{min} \le R \le R1_{max}$
R1 max	Resistance measurement one hour after post trip	$R0_{min} \le R \le R1_{max}$
I-hold	Hold rated current 1800 second without trip, @25°C	No trip
I-trip	Device must trip within 900 second under rated current, @25°C	Trip
Max. time to trip	At specified current, 25°C	T ≤ max. time to trip (seconds)
Trip Cycle Life	V_{max}, I_{max}, 100 cycles	No arcing or burning
Trip Endurance	V_{max}, I_{max} 24 hours	No arcing or burning
Solderability	ANSI/J-STD-002	95 % min. coverage

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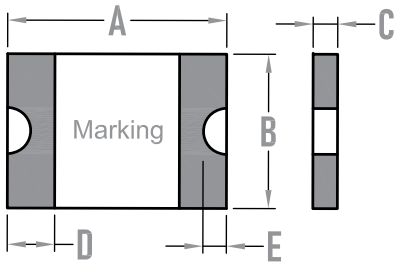
SMD0603 Series

SMD0603 Polymer PPTC

Product Dimensions(mm)



Model	A		B		C		D		E	Quantity
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	PCS/R
SMD0603-001/60N	1.45	1.85	0.65	1.05	0.40	0.80	0.15	0.50	0.05	5000
SMD0603-001/72N	1.45	1.85	0.65	1.05	0.40	0.80	0.15	0.50	0.05	5000
SMD0603-002/60N	1.45	1.85	0.65	1.05	0.40	0.80	0.15	0.50	0.05	5000
SMD0603-003/30N	1.45	1.85	0.65	1.05	0.40	0.80	0.15	0.50	0.05	5000
SMD0603-003/60N	1.45	1.85	0.65	1.05	0.40	0.80	0.15	0.50	0.05	5000
SMD0603-004/24N	1.45	1.85	0.65	1.05	0.40	0.80	0.15	0.50	0.05	5000
SMD0603-004/30N	1.45	1.85	0.65	1.05	0.40	0.80	0.15	0.50	0.05	5000
SMD0603-004/48N	1.45	1.85	0.65	1.05	0.40	0.80	0.15	0.50	0.05	5000
SMD0603-005/24N	1.45	1.85	0.65	1.05	0.40	0.80	0.15	0.50	0.05	5000
SMD0603-005/30N	1.45	1.85	0.65	1.05	0.40	0.80	0.15	0.50	0.05	5000
SMD0603-005/48N	1.45	1.85	0.65	1.05	0.40	0.80	0.15	0.50	0.05	5000
SMD0603-008/30N	1.45	1.85	0.65	1.05	0.40	0.80	0.15	0.50	0.05	5000
SMD0603-010/15N	1.45	1.85	0.65	1.05	0.40	0.80	0.15	0.50	0.05	5000
SMD0603-010/24N	1.45	1.85	0.65	1.05	0.40	0.80	0.15	0.50	0.05	5000
SMD0603-010/33N	1.45	1.85	0.65	1.05	0.50	0.90	0.15	0.50	0.05	4000
SMD0603-010/36N	1.45	1.85	0.65	1.05	0.50	0.90	0.15	0.50	0.05	4000
SMD0603-016/33N	1.45	1.85	0.65	1.05	0.50	0.90	0.15	0.50	0.05	4000
SMD0603-016/36N	1.45	1.85	0.65	1.05	0.50	0.90	0.15	0.50	0.05	4000

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SMD0603 Series

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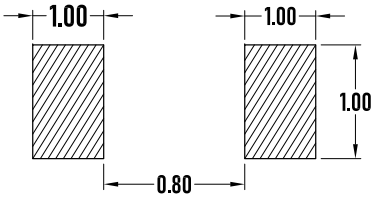
Product Dimensions(mm)

Model	A		B		C		D		E	Quantity
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
SMD0603-020/9N	1.45	1.85	0.65	1.05	0.40	0.80	0.15	0.50	0.05	5000
SMD0603-020/16N	1.45	1.85	0.65	1.05	0.40	0.80	0.15	0.50	0.05	5000
SMD0603-020/24N	1.45	1.85	0.65	1.05	0.50	0.90	0.15	0.50	0.05	4000
SMD0603-020/30N	1.45	1.85	0.65	1.05	0.50	0.90	0.15	0.50	0.05	4000
SMD0603-025/9N	1.45	1.85	0.65	1.05	0.40	0.80	0.15	0.50	0.05	5000
SMD0603-025/16N	1.45	1.85	0.65	1.05	0.40	0.80	0.15	0.50	0.05	5000
SMD0603-025/24N	1.45	1.85	0.65	1.05	0.50	0.90	0.15	0.50	0.05	4000
SMD0603-035/6N	1.45	1.85	0.65	1.05	0.40	0.80	0.15	0.50	0.05	5000
SMD0603-035/9N	1.45	1.85	0.65	1.05	0.50	0.90	0.15	0.50	0.05	4000
SMD0603-035/16N	1.45	1.85	0.65	1.05	0.50	0.90	0.15	0.50	0.05	4000
SMD0603-040/6N	1.45	1.85	0.65	1.05	0.50	0.90	0.15	0.50	0.05	4000
SMD0603-040/12N	1.45	1.85	0.65	1.05	0.50	0.90	0.15	0.50	0.05	4000
SMD0603-040/16N	1.45	1.85	0.65	1.05	0.50	0.90	0.15	0.50	0.05	4000
SMD0603-050/6N	1.45	1.85	0.65	1.05	0.50	0.90	0.15	0.50	0.05	4000
SMD0603-050/12N	1.45	1.85	0.65	1.05	0.50	0.90	0.15	0.50	0.05	4000
SMD0603-050/16N	1.45	1.85	0.65	1.05	0.50	0.90	0.15	0.50	0.05	4000
SMD0603-075/6N	1.45	1.85	0.65	1.05	0.50	0.90	0.15	0.50	0.05	4000

Recommended Pad Layout(mm)&Physical Specifications



Terminal Material	Tin-Plated Nickle-Copper (Solder Material: Matte Tin (Sn))
Lead Solderability	T Meets EIA Specification RS186-9E, ANSI/J-STD-002 Category 3.

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SMD0603 Series

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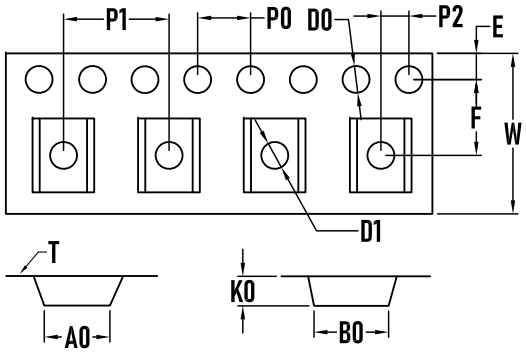
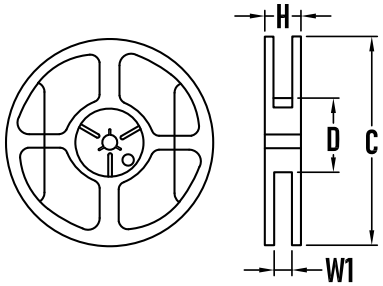
Tape And Reel Specifications (mm)&Packaging quantity

item	TAPE SPECIFICATIONS: EIA-481-1 (mm)	
W	8.00±0.30	8.00±0.30
F	3.50±0.10	3.50±0.10
E	1.75±0.10	1.75±0.10
D0	1.55±0.05	1.55±0.05
D1	0.50±0.10	0.50±0.10
P0	4.0±0.10	4.0±0.10
P1	4.0±0.10	4.0±0.10
P2	2.0±0.05	2.0±0.05
A0	1.10±0.10	1.10±0.10
B0	1.85±0.10	1.90±0.10
T	0.20±0.10	0.20±0.10
K0	0.72±0.10	0.85±0.10
Leader	390 mm	390 mm
Trailer	160 mm	160 mm
Quantity	5000pcs/Reel	4000pcs/Reel



Packaging quantity per Reel



REEL DIMENSIONS:EIA-481-1(mm)	
C	178±1.0
D	60.2±0.5
W1	9.0±1.5
H	11.0±0.5

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