

Positive Temperature Coefficient (PTC) Datasheet

Features

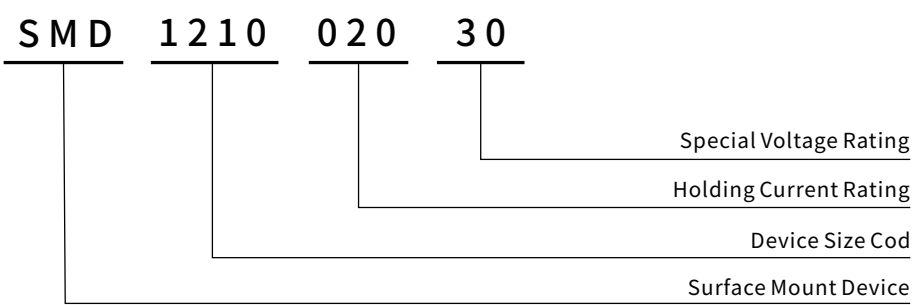
- I Hold: 0.05~2.0A
- Fast responding to fault current
- Size 1210 / 3.2*2.5mm
- Low resistance
- Low profile
- RoHS compliant & Lead-Free & Halogen Free

I Hold
0.05A to 2.0A

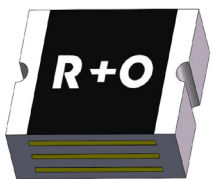
Applications

- USB hubs, ports and peripherals
- Computer, Mobile phones, Multimedia
- General electronics
- Disk drives
- Game machines, Portable electronics, Battery
- Plug and play protection for motherboards and peripherals

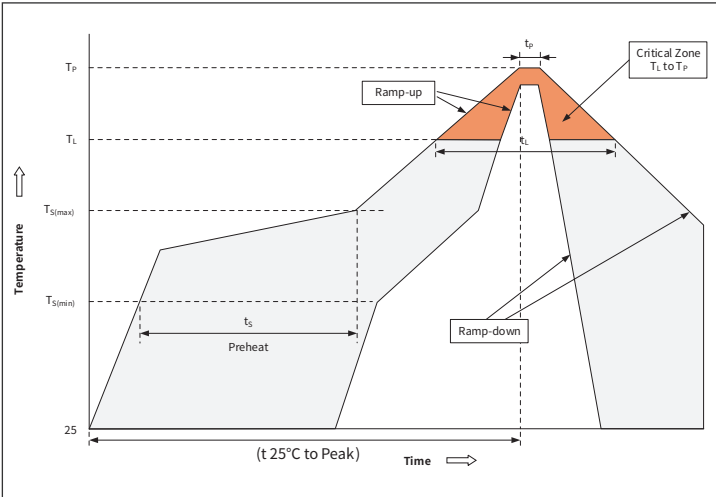
Part Number Code



SMD1210



Recommended Soldering Conditions



Profile Feature		Pb-Free Assembly
Pre-heat	Temperature Min (Ts(min))	+150°C
	Temperature Max(Ts(max))	+200°C
	Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (Tl) to peak)		3°C /sec. Max
Ts(max) to Tl - Ramp-up Rate		3°C /sec. Max
Reflow	Temperature(Tl)(Liquid us)	+217°C
	Temperature(tl)	60-150 secs.
Peak Temp (Tp)		+260(+0/-5)°C
Time within 5°C of actual Peak Temp (tp)		20-40secs
Ramp-down Rate		6°C /sec. Max
Time 25°C to Peak Temp (Tp)		8 min. Max
Do not exceed		+260°C

Recommended reflow methods: IR, vapor phase oven, hot air oven, N2 environment for lead-free. Recommended maximum paste thickness is 0.25mm. Devices 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.

● Electrical Characteristics (Ta=25°C Unless otherwise specified)

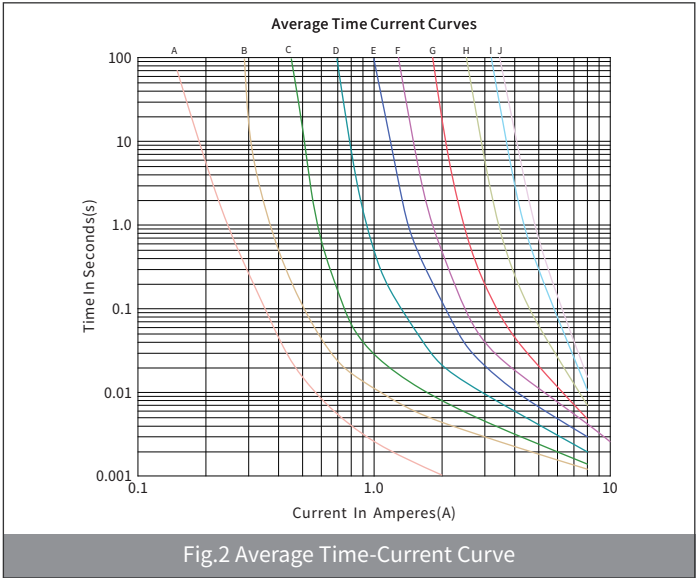
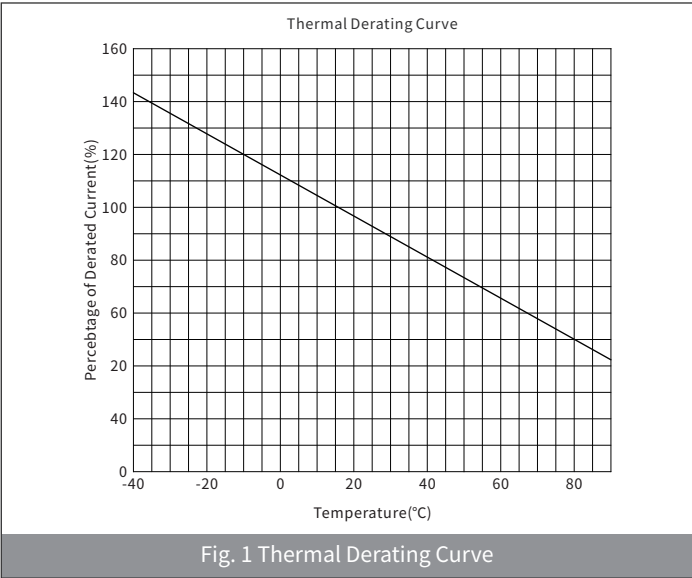
Part Number	Marking	I _{hold}	I _{trip}	V _{max}	I _{max}	P _{dtyp}	Max. Time-to-trip		R _{i min}	R _{1 max}
		(A)	(A)	(V)	(A)	(W)	(A)	(S)	(Ω)	(Ω)
SMD1210-005-30	E	0.05	0.15	30	40	0.6	0.25	1.50	2.800	50.00
SMD1210-005-60	E	0.05	0.15	60	40	0.6	0.25	1.50	2.800	50.00
SMD1210-010-30	01	0.10	0.30	30	40	0.6	0.50	0.60	0.800	15.00
SMD1210-010-60	01	0.10	0.30	60	40	0.6	0.50	0.60	0.800	15.00
SMD1210-020-30	02	0.20	0.40	60	40	0.6	8.00	0.02	0.400	5.000
SMD1210-020-60	02	0.20	0.40	60	40	0.6	8.00	0.02	0.400	5.000
SMD1210-035-6	03	0.35	0.75	6	40	0.6	8.00	0.20	0.200	1.300
SMD1210-035-16	03	0.35	0.75	16	40	0.6	8.00	0.20	0.200	1.300
SMD1210-035-24	03	0.35	0.75	24	40	0.6	8.00	0.20	0.200	1.300
SMD1210-035-60	03	0.35	0.75	60	40	0.6	8.00	0.20	0.200	1.30
SMD1210-035-30	03	0.35	0.75	30	40	0.6	8.00	0.20	0.200	1.30
SMD1210-050-13.2	05	0.50	1.00	13.2	40	0.6	8.00	0.10	0.180	0.900
SMD1210-050-24	05	0.50	1.00	24	40	0.6	8.00	0.10	0.180	0.900
SMD1210-050-30	05	0.50	1.00	30	40	0.6	8.00	0.10	0.18	0.90
SMD1210-075-6	07	0.75	1.50	6	40	0.6	8.00	0.10	0.070	0.400
SMD1210-075-16	07	0.75	1.50	16	40	0.6	8.00	0.10	0.070	0.400
SMD1210-075-24	07	0.75	1.50	24	40	0.6	8.00	0.10	0.07	0.40
SMD1210-110-6	11	1.10	2.20	6	40	0.6	8.00	0.30	0.050	0.210
SMD1210-110-8	11	1.10	2.20	8	40	0.6	8.00	0.30	0.05	0.21
SMD1210-110-12	11	1.10	2.20	12	40	0.6	8.00	0.30	0.050	0.210
SMD1210-110-16	11	1.10	2.20	16	40	0.6	8.00	0.30	0.05	0.21
SMD1210-150-6	15	1.50	3.00	6	40	0.8	8.00	0.50	0.030	0.110
SMD1210-150-12	15	1.50	3.00	12	40	0.8	8.00	0.50	0.030	0.110
SMD1210-150-16	15	1.50	3.00	16	40	0.8	8.00	0.50	0.030	0.110
SMD1210-175-6	17	1.75	3.50	6	40	0.8	8.00	0.60	0.020	0.080
SMD1210-200-6	20	2.00	4.00	6	40	0.8	8.00	1.00	0.015	0.070

● Vocabulary

- 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_{dtyp} = 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.

Caution: Operation beyond the specified ratings may result in damage and possible arcing and flame.

● Ratings And Characteristics Curves (Ta=25°C Unless otherwise specified)



Note: Fig.2 Average Time-Current Curve

A: SMD1210-005 B: SMD1210-010 C: SMD1210-020 D: SMD1210-035 E: SMD1210-050
F: SMD1210-075 G: SMD1210-110 H: SMD1210-150 I: SMD1210-175 J: SMD1210-200

● Thermal Derating Chart

Part Number	Ambient operating temperature hold current(Ihold)								
	-40°C	-20°C	0°C	25°C	40°C	50°C	60°C	70°C	85°C
SMD1210-005	0.08	0.07	0.06	0.05	0.04	0.04	0.03	0.03	0.02
SMD1210-010	0.16	0.14	0.12	0.10	0.08	0.07	0.06	0.05	0.03
SMD1210-020	0.29	0.26	0.22	0.20	0.16	0.14	0.13	0.11	0.08
SMD1210-035	0.47	0.45	0.40	0.35	0.33	0.28	0.24	0.21	0.18
SMD1210-050	0.76	0.67	0.58	0.50	0.43	0.40	0.36	0.32	0.28
SMD1210-075	1.00	0.97	0.86	0.75	0.64	0.59	0.54	0.48	0.40
SMD1210-110	1.69	1.48	1.29	1.10	0.88	0.76	0.65	0.57	0.43
SMD1210-150	2.13	1.92	1.71	1.50	1.26	1.14	1.01	0.89	0.71
SMD1210-175	2.54	2.30	2.02	1.75	1.47	1.33	1.18	1.05	0.86
SMD1210-200	2.90	2.63	2.31	2.00	1.68	1.52	1.35	1.20	0.98

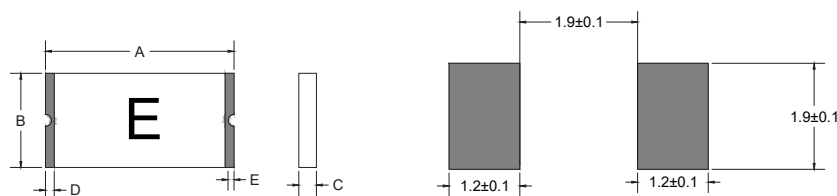
● Environmental Specifications

Operating / Storage temperature:	-40°C to +85°C
Passive Aging :	+85°C , 1000 hours
Humidity Aging :	+85°C , 85%R.H. 168 hours
Thermal Shock :	MIL-STD-202, Method 107G ; +85°C /-40°C 20 times
Solvent Resistance:	MIL-STD-202, Method 215 No change
Vibration:	MIL-STD-202,Method 201 No change
Maximum Device Surface Temperature in Tripped State :	125°C
Storage Conditions:	Light-proof, Hermetically Sealed, Moisture-proof

● Ordering Information

PACKAGE	SIZE(mm)	DELIVERY MODE	MPQ(PCS)
SMD1210	3.2*2.5	7" REEL	4,000

● Physical Dimensions & Recommended Pad Layout



Part Number	A		B		C		D	E
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Min.
SMD1210-005-30	3.00	3.50	2.35	2.80	0.60	1.20	0.30	0.10
SMD1210-005-60	3.00	3.50	2.35	2.80	0.60	1.20	0.30	0.10
SMD1210-010-30	3.00	3.50	2.35	2.80	0.60	1.20	0.30	0.10
SMD1210-010-60	3.00	3.50	2.35	2.80	0.60	1.20	0.30	0.10
SMD1210-020-30	3.00	3.50	2.35	2.80	0.50	1.10	0.30	0.10
SMD1210-020-60	3.00	3.50	2.35	2.80	0.50	1.10	0.30	0.10
SMD1210-035-6	3.00	3.50	2.35	2.80	0.50	1.10	0.30	0.10
SMD1210-035-16	3.00	3.50	2.35	2.80	0.50	1.10	0.30	0.10
SMD1210-035-24	3.00	3.50	2.35	2.80	0.50	1.10	0.30	0.10
SMD1210-035-60	3.00	3.50	2.35	2.80	0.50	1.10	0.30	0.10
SMD1210-035-30	3.00	3.50	2.35	2.80	0.50	1.10	0.30	0.10
SMD1210-050-13.2	3.00	3.50	2.35	2.80	0.50	1.10	0.30	0.10
SMD1210-050-24	3.00	3.50	2.35	2.80	0.50	1.10	0.30	0.10
SMD1210-050-30	3.00	3.50	2.35	2.80	0.50	1.10	0.30	0.10
SMD1210-075-6	3.00	3.50	2.35	2.80	0.50	1.10	0.30	0.10
SMD1210-075-16	3.00	3.50	2.35	2.80	0.50	1.10	0.30	0.10
SMD1210-075-24	3.00	3.50	2.35	2.80	0.50	1.10	0.30	0.10
SMD1210-110-6	3.00	3.50	2.35	2.80	0.50	1.10	0.30	0.10
SMD1210-110-8	3.00	3.50	2.35	2.80	0.50	1.10	0.30	0.10
SMD1210-110-12	3.00	3.50	2.35	2.80	0.50	1.10	0.30	0.10
SMD1210-110-16	3.00	3.50	2.35	2.80	0.50	1.10	0.30	0.10
SMD1210-150-6	3.00	3.50	2.35	2.80	0.50	1.20	0.30	0.10
SMD1210-150-12	3.00	3.50	2.35	2.80	0.50	1.20	0.30	0.10
SMD1210-150-16	3.00	3.50	2.35	2.80	0.50	1.20	0.30	0.10
SMD1210-175-6	3.00	3.50	2.35	2.80	0.80	1.40	0.30	0.10
SMD1210-200-6	3.00	3.50	2.35	2.80	0.80	1.40	0.30	0.10

● Warning

- Users shall independently assess the suitability of these devices for each of their applications.
- Operation of these devices beyond the stated maximum ratings could result in damage to the devices and lead to electrical arcing and/or fire.
- These devices are intended to protect against the effects of temporary over-current or over-temperature conditions and are not intended to perform as protective devices where such conditions are expected to be repetitive or prolonged in duration.
- Exposure to silicon-based oils, solvents, electrolytes, acids, and similar materials can adversely affect the prolonged of these PPTC devices.
- These devices undergo thermal expansion under fault conditions, and thus shall be provided with adequate space and be protected against mechanical stresses.
- Circuits with inductance may generate a voltage ($L di/dt$) above the rated voltage of the PPTC device.