Positive Temperature Coefficient (PTC) Datasheet

Features

- I Hold: 0.05~3.0A
- Fast responding to fault current
- Size 1206 / 3.2*1.6mm
- Low resistance
- Low profile
- RoHS compliant & Lead-Free & Halogen Free

I Hold
0.05A to 3.0A

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

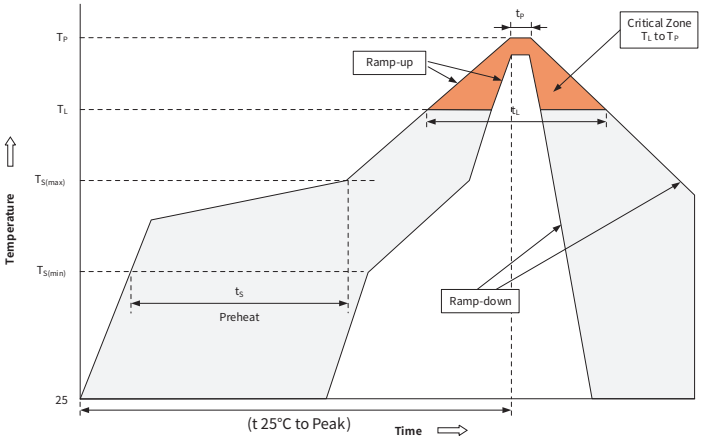
SMD1206

Part Number Code

SMD 1206 020 30

- 30 — Special Voltage Rating
- 020 — Holding Current Rating
- 1206 — Device Size Cod
- SMD — Surface Mount Device

Recommended Soldering Conditions



Profile Feature		Pb-Free Assembly
Pre-heat	Temperature Min ($T_{S(min)}$)	+150°C
	Temperature Max($T_{S(max)}$)	+200°C
	Time (Min to Max) (t_S)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3°C /sec. Max
$T_{S(max)}$ to T_L - Ramp-up Rate		3°C /sec. Max
Reflow	Temperature(T_L)(Liquid us)	+217°C
	Temperature(t_L)	60-150 secs.
Peak Temp (T_P)		+260(+0/-5)°C
Time within 5°C of actual Peak Temp (t_P)		20-40secs
Ramp-down Rate		6°C /sec. Max
Time 25°C to Peak Temp (T_P)		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	Ihold	Itrip	Vmax	Imax	Pdtyp	Max. Time-to-trip		Ri min	R1 max
		(A)	(A)	(V)	(A)	(W)	(A)	(S)	(Ω)	(Ω)
SMD1206-005-30	E	0.05	0.15	30	40	0.6	0.25	1.5	3.6	50
SMD1206-005-60	E	0.05	0.15	60	40	0.6	0.25	1.5	3.6	50
SMD1206-010-30	01	0.1	0.25	30	40	0.6	0.5	1	1.6	15
SMD1206-010-60	01	0.1	0.25	60	40	0.6	0.5	1	1.6	15
SMD1206-012-30	01	0.12	0.29	30	40	0.6	0.5	1	1.5	6
SMD1206-012-48	01	0.12	0.29	48	40	0.6	0.5	1	1.5	6
SMD1206-012-60	01	0.12	0.29	60	40	0.6	0.5	1	1.6	13
SMD1206-016-30	01	0.16	0.37	30	40	0.6	1	0.3	1.2	4.5
SMD1206-020-24	02	0.2	0.46	24	40	0.6	8	0.1	0.35	2.7
SMD1206-020-30	02	0.2	0.46	30	40	0.6	8	0.1	0.35	2.7
SMD1206-020-48	02	0.2	0.46	48	40	0.6	8	0.1	0.35	2.7
SMD1206-025-16	02	0.25	0.5	16	40	0.6	8	0.1	0.55	2.3
SMD1206-025-24	02	0.25	0.55	24	40	0.6	8	0.1	0.55	2.3
SMD1206-025-30	02	0.25	0.5	30	40	0.6	8	0.1	0.35	2.5
SMD1206-025-33	02	0.25	0.5	33	40	0.6	8	0.1	0.35	2.5
SMD1206-030-16	03	0.3	0.65	16	40	0.6	8	0.1	0.25	1.7
SMD1206-035-16	03	0.35	0.75	16	40	0.6	8	0.1	0.3	1.2
SMD1206-035-30	03	0.35	0.75	30	40	0.6	8	0.1	0.3	1.2
SMD1206-035-33	03	0.35	0.75	33	40	0.6	8	0.1	0.25	1.5
SMD1206-050-6	05	0.5	1	6	40	0.6	8	0.1	0.15	0.7
SMD1206-050-15	05	0.5	1	15	40	0.6	8	0.1	0.15	0.75
SMD1206-050-16	05	0.5	1	16	40	0.6	8	0.1	0.15	0.75
SMD1206-050-24	05	0.5	1	24	40	0.6	8	0.1	0.15	0.75
SMD1206-050-30	05	0.5	1	30	40	0.6	8	0.1	0.15	0.75
SMD1206-050-33	05	0.5	1	33	40	0.6	8	0.1	0.15	0.75
SMD1206-075-8	07	0.75	1.5	8	40	0.6	8	0.2	0.09	0.5
SMD1206-075-13.2	07	0.75	1.5	13.2	40	0.6	8	0.2	0.09	0.5
SMD1206-075-16	07	0.75	1.5	16	40	0.6	8	0.2	0.09	0.5
SMD1206-075-30	07	0.75	1.5	30	40	0.8	8	0.2	0.09	0.5
SMD1206-100-6	10	1	1.8	6	40	0.8	8	0.3	0.05	0.27
SMD1206-100-13.2	10	1	1.8	13.2	40	0.8	8	0.3	0.05	0.27
SMD1206-100-16	10	1	1.8	16	40	0.8	8	0.3	0.05	0.27
SMD1206-100-24	10	1	1.8	24	40	1	8	0.3	0.05	0.3
SMD1206-100-30	10	1	1.8	30	40	1	8	0.3	0.05	0.3
SMD1206-110-8	11	1.1	2.2	8	40	0.8	8	0.3	0.04	0.25
SMD1206-110-16	11	1.1	2.2	16	40	0.8	8	0.3	0.04	0.25
SMD1206-150-6	15	1.5	3	6	40	0.8	8	0.3	0.025	0.13
SMD1206-150-8	15	1.5	3	8	40	0.8	8	0.3	0.025	0.13
SMD1206-150-16	15	1.5	3	16	40	1	8	0.3	0.025	0.13
SMD1206-175-6	17	1.75	3.5	6	40	0.8	8	0.5	0.02	0.09
SMD1206-200-6	20	2	3.5	6	40	1	8	1.5	0.015	0.08
SMD1206-200-12	20	2	3.5	12	40	1	8	1.5	0.015	0.08
SMD1206-300-6	30	3	6	6	40	1	8	4	0.01	0.05

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 (Imax).
- I_{max} = Maximum fault current device can withstand without damage at rated voltage (Vmax).
- $P_{dtyp.}$ = 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)

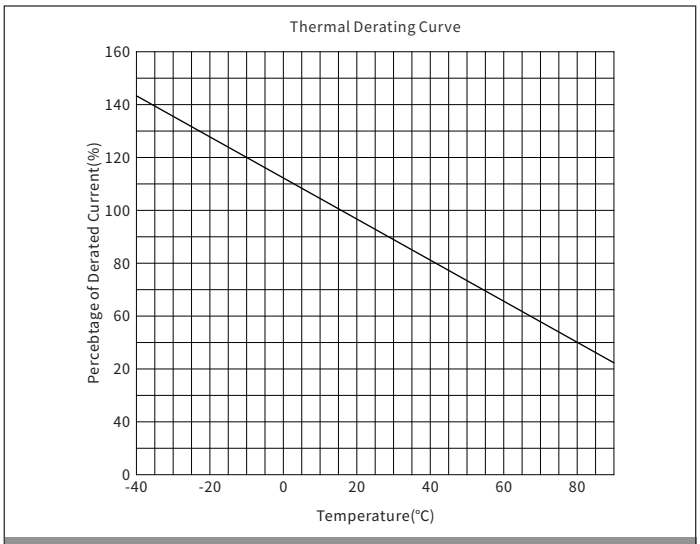


Fig. 1 Thermal Derating Curve

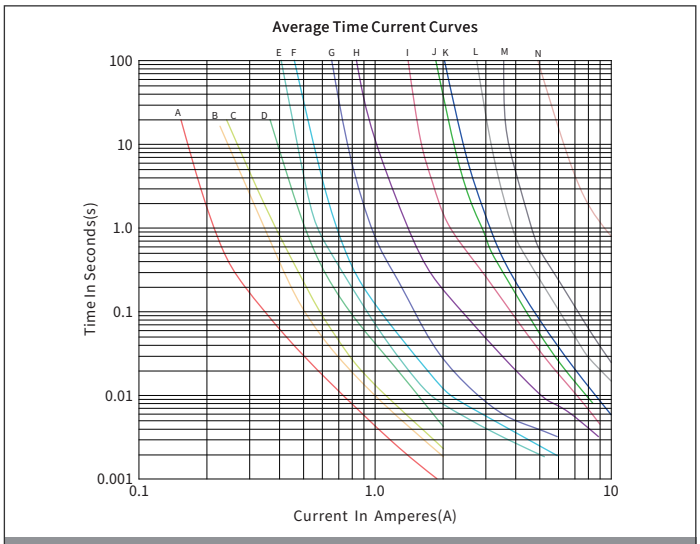


Fig.2 Average Time-Current Curve

Note: Fig.2 Average Time-Current Curve

A: SMD1206-005 B: SMD1206-010 C: SMD1206-012 D: SMD1206-016 E: SMD1206-020
F: SMD1206-025 G: SMD1206-035 H: SMD1206-050 I : SMD1206-075 J: SMD1206-100
K: SMD1206-110 L : SMD1206-150 M: SMD1206-200 N: SMD1206-300

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
SMD1206-005	0.074	0.066	0.056	0.050	0.042	0.037	0.035	0.030	0.027
SMD1206-010	0.148	0.132	0.116	0.100	0.085	0.075	0.070	0.060	0.055
SMD1206-012	0.18	0.16	0.14	0.12	0.10	0.09	0.08	0.07	0.06
SMD1206-016	0.24	0.21	0.18	0.16	0.14	0.13	0.12	0.11	0.10
SMD1206-020	0.30	0.26	0.23	0.20	0.17	0.15	0.14	0.12	0.11
SMD1206-025	0.37	0.33	0.29	0.25	0.22	0.20	0.17	0.15	0.12
SMD1206-035	0.50	0.45	0.40	0.35	0.30	0.27	0.24	0.21	0.15
SMD1206-050	0.71	0.64	0.57	0.50	0.42	0.39	0.35	0.31	0.25
SMD1206-075	1.14	1.01	0.88	0.75	0.65	0.59	0.54	0.49	0.41
SMD1206-100	1.45	1.31	1.15	1.00	0.84	0.77	0.69	0.61	0.48
SMD1206-110	1.60	1.45	1.30	1.10	0.95	0.80	0.72	0.66	0.55
SMD1206-150	2.18	1.94	1.72	1.50	1.28	1.17	1.06	0.96	0.77
SMD1206-200	2.88	2.63	2.34	2.00	1.74	1.58	1.42	1.17	0.93
SMD1206-300	4.05	3.66	3.36	3.00	2.50	2.28	2.00	1.62	1.38

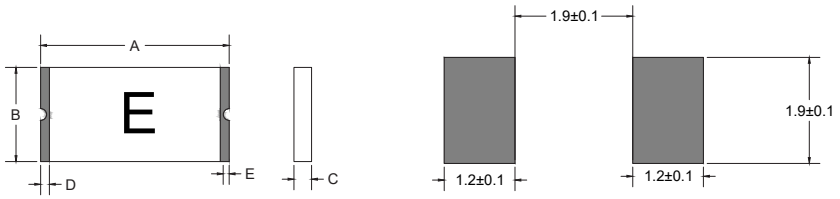
Environmental Specifications

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)	Part Number	DELIVERY MODE	MPQ(PCS)
SMD1206	3.2*1.6	SMD1206-016-30 SMD1206-020-XX SMD1206-025-XX SMD1206-030-16 SMD1206-035-16 SMD1206-050-6 SMD1206-075-8 SMD1206-100-6 SMD1206-110-8	7''REEL	4,500
		Others	7''REEL	3,500

Physical Dimensions & Recommended Pad Layout



Part Number	A		B		C		D	E
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Min.
SMD1206-005-30	3.00	3.60	1.50	1.90	0.60	1.20	0.15	0.10
SMD1206-005-60	3.00	3.60	1.50	1.90	0.60	1.20	0.15	0.10
SMD1206-010-30	3.00	3.60	1.50	1.90	0.60	1.20	0.15	0.10
SMD1206-010-60	3.00	3.60	1.50	1.90	0.60	1.20	0.15	0.10
SMD1206-012-30	3.00	3.60	1.50	1.90	0.60	1.20	0.15	0.10
SMD1206-012-48	3.00	3.60	1.50	1.90	0.60	1.20	0.15	0.10
SMD1206-012-60	3.00	3.60	1.50	1.90	0.60	1.20	0.15	0.10
SMD1206-016-30	3.00	3.60	1.50	1.90	0.40	1.00	0.15	0.10
SMD1206-020-24	3.00	3.60	1.50	1.90	0.40	1.00	0.15	0.10
SMD1206-020-30	3.00	3.60	1.50	1.90	0.40	1.00	0.15	0.10
SMD1206-020-48	3.00	3.60	1.50	1.90	0.40	1.00	0.15	0.10
SMD1206-025-16	3.00	3.60	1.50	1.90	0.40	1.00	0.15	0.10
SMD1206-025-24	3.00	3.60	1.50	1.90	0.40	1.00	0.15	0.10

Physical Dimensions & Recommended Pad Layout

Part Number	A		B		C		D	E
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Min.
SMD1206-025-30	3.00	3.60	1.50	1.90	0.40	1.00	0.15	0.10
SMD1206-025-33	3.00	3.60	1.50	1.90	0.40	1.00	0.15	0.10
SMD1206-030-16	3.00	3.60	1.50	1.90	0.40	1.00	0.15	0.10
SMD1206-035-16	3.00	3.60	1.50	1.90	0.35	0.80	0.15	0.10
SMD1206-035-30	3.00	3.60	1.50	1.90	0.35	0.80	0.15	0.10
SMD1206-035-33	3.00	3.60	1.50	1.90	0.35	0.80	0.15	0.10
SMD1206-050-6	3.00	3.60	1.50	1.90	0.35	0.80	0.15	0.10
SMD1206-050-15	3.00	3.60	1.50	1.90	0.35	0.80	0.15	0.10
SMD1206-050-16	3.00	3.60	1.50	1.90	0.35	0.80	0.15	0.10
SMD1206-050-24	3.00	3.60	1.50	1.90	0.40	0.90	0.15	0.10
SMD1206-050-30	3.00	3.60	1.50	1.90	0.50	1.00	0.15	0.10
SMD1206-050-33	3.00	3.60	1.50	1.90	0.60	1.50	0.15	0.10
SMD1206-075-8	3.00	3.60	1.50	1.90	0.40	1.00	0.15	0.10
SMD1206-075-13.2	3.00	3.60	1.50	1.90	0.50	1.00	0.15	0.10
SMD1206-075-16	3.00	3.60	1.50	1.90	0.50	1.00	0.15	0.10
SMD1206-075-30	3.00	3.60	1.50	1.90	0.70	1.30	0.15	0.10
SMD1206-100-6	3.00	3.60	1.50	1.90	0.35	0.80	0.15	0.10
SMD1206-100-13.2	3.00	3.60	1.50	1.90	0.40	1.00	0.15	0.10
SMD1206-100-16	3.00	3.60	1.50	1.90	0.50	1.00	0.15	0.10
SMD1206-100-24	3.00	3.60	1.50	1.90	0.70	1.30	0.15	0.10
SMD1206-100-30	3.00	3.60	1.50	1.90	0.70	1.30	0.15	0.10
SMD1206-110-8	3.00	3.60	1.50	1.90	0.35	0.80	0.15	0.10
SMD1206-110-16	3.00	3.60	1.50	1.90	0.50	1.00	0.15	0.10
SMD1206-150-6	3.00	3.60	1.50	1.90	0.50	1.00	0.15	0.10
SMD1206-150-8	3.00	3.60	1.50	1.90	0.70	1.20	0.15	0.10
SMD1206-150-16	3.00	3.60	1.50	1.90	1.00	1.60	0.15	0.10
SMD1206-175-6	3.00	3.60	1.50	1.90	0.60	1.10	0.15	0.10
SMD1206-200-6	3.00	3.60	1.50	1.90	0.70	1.30	0.15	0.10
SMD1206-200-12	3.00	3.60	1.50	1.90	1.00	1.60	0.15	0.10
SMD1206-300-6	3.00	3.60	1.50	1.90	1.00	1.60	0.15	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.