

Positive Temperature Coefficient (PTC) Datasheet

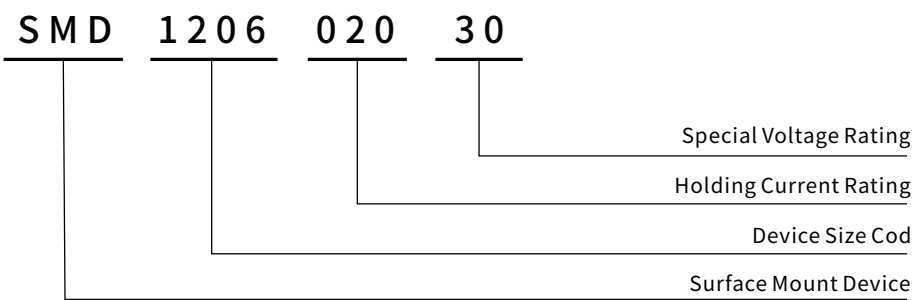
Features

- I Hold: 0.03~3.0A
- Fast responding to fault current
- Size 1206 / 3.2*1.6mm
- Low resistance
- Low profile
- RoHS compliant & Lead-Free & Halogen Free

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

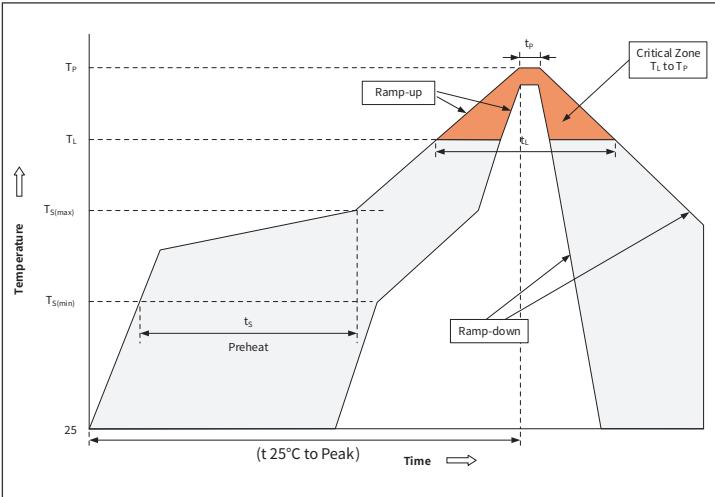


I Hold
0.03A to 3.0A

SMD1206



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.

SMD1206 SERIES

Surface Mount PTC Device

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

Part Number	Marking	I _{hold}	I _{trip}	V _{max}	I _{max}	P _{d typ}	Max. Time-to-trip		R _{i min}	R _{1 max}
		(A)	(A)	(V)	(A)	(W)	(A)	(Sec)	(Ω)	(Ω)
SMD1206-003-60	C	0.03	0.1	60	10	0.4	0.2	1.2	5.0	70
SMD1206-005-24	E	0.05	0.15	24	10	0.4	0.3	1.5	3.60	50
SMD1206-005-30	E	0.05	0.15	30	10	0.6	0.3	1.5	3.60	50
SMD1206-005-60	E	0.05	0.15	60	10	0.6	0.3	1.5	3.60	50
SMD1206-010-24	01	0.10	0.25	24	10	0.4	0.5	1.0	1.60	15
SMD1206-010-30	01	0.10	0.25	30	10	0.6	0.5	1.0	1.60	15
SMD1206-010-60	01	0.10	0.25	60	10	0.6	0.5	1.0	1.60	15
SMD1206-012-24	01	0.12	0.29	24	40	0.4	0.5	1.0	1.60	13
SMD1206-012-30	01	0.12	0.29	30	40	0.6	0.5	1.0	1.50	15
SMD1206-012-48	01	0.12	0.29	48	40	0.6	0.5	1.0	1.50	15
SMD1206-012-60	01	0.12	0.29	60	40	0.6	0.5	1.0	1.60	15
SMD1206-016-24	01	0.16	0.37	24	40	0.4	1.0	0.3	1.00	6.0
SMD1206-016-30	01	0.16	0.37	30	40	0.6	1.0	0.3	1.00	6.0
SMD1206-016-60	01	0.16	0.37	60	40	0.6	1.0	0.3	1.00	6.0
SMD1206-020-24	02	0.20	0.46	24	40	0.6	8.0	0.1	0.35	2.70
SMD1206-020-30	02	0.20	0.46	30	40	0.6	8.0	0.1	0.35	2.70
SMD1206-020-33	02	0.20	0.46	33	40	0.6	8.0	0.1	0.35	2.70
SMD1206-020-48	02	0.20	0.46	48	40	0.6	8.0	0.1	0.35	2.70
SMD1206-025-16	02	0.25	0.50	16	40	0.6	8.0	0.1	0.35	2.50
SMD1206-025-24	02	0.25	0.50	24	40	0.6	8.0	0.1	0.35	2.50
SMD1206-025-30	02	0.25	0.50	30	40	0.6	8.0	0.1	0.35	2.50
SMD1206-025-33	02	0.25	0.50	33	40	0.6	8.0	0.1	0.35	2.50
SMD1206-030-16	03	0.30	0.65	16	40	0.6	8.0	0.1	0.25	1.70
SMD1206-030-30	03	0.30	0.65	30	40	0.6	8.0	0.1	0.25	1.70
SMD1206-035-6	03	0.35	0.75	6.0	40	0.6	8.0	0.1	0.30	1.30
SMD1206-035-16	03	0.35	0.75	16	40	0.6	8.0	0.1	0.30	1.30
SMD1206-035-24	03	0.35	0.75	24	40	0.6	8.0	0.1	0.30	1.30
SMD1206-035-30	03	0.35	0.75	30	40	0.6	8.0	0.1	0.30	1.30
SMD1206-035-33	03	0.35	0.75	33	40	0.6	8.0	0.1	0.25	1.50
SMD1206-050-6	05	0.50	1.0	6.0	40	0.6	8.0	0.1	0.15	0.70
SMD1206-050-9	05	0.5	1.0	9.0	40	0.6	8.0	0.1	0.15	0.70
SMD1206-050-13.2	05	0.50	1.0	13.2	40	0.6	8.0	0.1	0.15	0.70
SMD1206-050-15	05	0.50	1.0	15	40	0.6	8.0	0.1	0.15	0.75
SMD1206-050-16	05	0.50	1.0	16	40	0.6	8.0	0.1	0.15	0.75
SMD1206-050-24	05	0.50	1.0	24	40	0.6	8.0	0.1	0.15	0.75
SMD1206-050-30	05	0.50	1.0	30	40	0.6	8.0	0.1	0.15	0.75
SMD1206-050-33	05	0.50	1.0	33	40	0.6	8.0	0.1	0.15	0.75
SMD1206-075-8	07	0.75	1.5	8.0	40	0.6	8.0	0.2	0.09	0.50
SMD1206-075-13.2	07	0.75	1.5	13.2	40	0.6	8.0	0.2	0.09	0.50
SMD1206-075-16	07	0.75	1.5	16	40	0.6	8.0	0.2	0.09	0.50
SMD1206-075-24	07	0.75	1.5	24	40	0.6	8.0	0.2	0.09	0.50
SMD1206-075-30	07	0.75	1.5	30	40	0.8	8.0	0.2	0.09	0.50
SMD1206-100-6	10	1.0	1.8	6.0	40	0.8	8.0	0.3	0.05	0.27
SMD1206-100-13.2	10	1.0	1.8	13.2	40	0.8	8.0	0.3	0.05	0.27
SMD1206-100-16	10	1.0	1.8	16	40	0.8	8.0	0.3	0.05	0.27

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

Part Number	Marking	I_{hold}	I_{trip}	V_{max}	I_{max}	$P_{d\ typ}$	Max. Time-to-trip		$R_{i\ min}$	$R_{1\ max}$
		(A)	(A)	(V)	(A)	(W)	(A)	(Sec)	(Ω)	(Ω)
SMD1206-100-24	10	1.0	1.8	24	40	1.0	8.0	0.3	0.05	0.30
SMD1206-100-30	10	1.0	1.8	30	40	1.0	8.0	0.3	0.05	0.30
SMD1206-110-8	11	1.10	2.2	8.0	40	0.8	8.0	0.3	0.04	0.25
SMD1206-110-16	11	1.10	2.2	16	40	0.8	8.0	0.3	0.04	0.25
SMD1206-110-24	11	1.10	2.2	24	40	0.8	8.0	0.3	0.04	0.25
SMD1206-110-30	11	1.10	2.2	30	40	0.8	8.0	0.3	0.04	0.25
SMD1206-150-6	15	1.50	3.0	6.0	40	0.8	8.0	0.3	0.025	0.13
SMD1206-150-8	15	1.50	3.0	8.0	40	0.8	8.0	0.3	0.025	0.13
SMD1206-150-16	15	1.50	3.0	16	40	1.0	8.0	0.3	0.025	0.13
SMD1206-175-6	17	1.75	3.5	6.0	40	0.8	8.0	0.5	0.02	0.09
SMD1206-200-6	20	2.0	3.5	6.0	40	1.0	8.0	1.5	0.015	0.08
SMD1206-200-12	20	2.0	3.5	12	40	1.0	8.0	1.5	0.015	0.08
SMD1206-200-13.2	20	2.0	3.5	13.2	40	1.0	8.0	1.5	0.015	0.08
SMD1206-200-16	20	2.0	3.5	16	40	1.0	8.0	1.5	0.015	0.08
SMD1206-260-6	26	2.6	5.2	6.0	40	1.0	8.0	2.0	0.01	0.06
SMD1206-260-12	26	2.6	5.2	12	40	1.0	8.0	2.0	0.01	0.06
SMD1206-300-6	30	3.0	6.0	6.0	40	1.0	8.0	4.0	0.01	0.050

● 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}).
 - $P_{d\ typ}$ = Typical power dissipated from device when in the tripped state at 25°C still air.
 - $R_{i\ min}$ = Minimum resistance of device in initial (un-soldered) state.
 - $R_{1\ max}$ = 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)

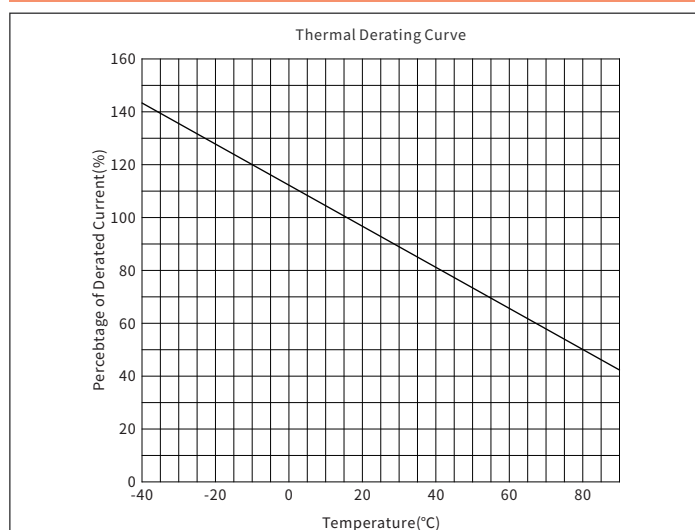


Fig. 1 Thermal Derating Curve

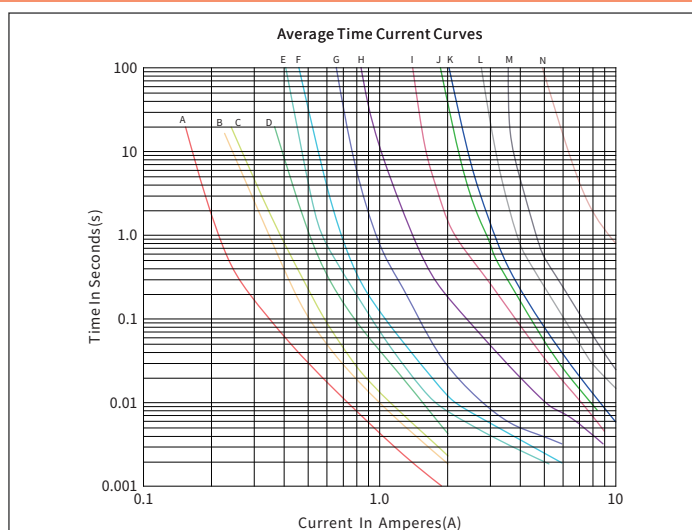


Fig.2 Average Time-Current Curve

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℃	-20℃	0℃	25℃	40℃	50℃	60℃	70℃	85℃
SMD1206-003	0.047	0.041	0.036	0.030	0.024	0.021	0.018	0.016	0.0108
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
SMD1206-030	0.435	0.39	0.345	0.30	0.255	0.225	0.204	0.18	0.135
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
SMD1206-260	3.43	3.22	2.93	2.60	2.23	2.03	1.87	1.57	1.35
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℃ to +85℃
Passive Aging :	+85℃ , 1000 hours
Humidity Aging :	+85℃ , 85%R.H. 168 hours
Thermal Shock :	MIL-STD-202, Method 107G ; +85℃ /-40℃ 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℃
Storage Conditions:	Light-proof, Hermetically Sealed, Moisture-proof

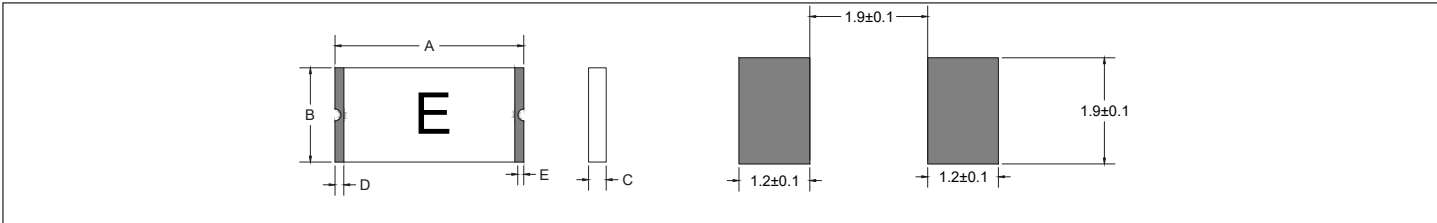
● Ordering Information

PACKAGE	SIZE(mm)	Part Number	DELIVERY MODE	MPQ(PCS)
SMD1206	3.2*1.6	SMD1206-016-24 SMD1206-016-30 SMD1206-020-XX SMD1206-025-XX SMD1206-030-16 SMD1206-035-6 SMD1206-035-16 SMD1206-050-6 SMD1206-075-8 SMD1206-100-6 SMD1206-110-8 SMD1206-050-9 SMD1206-050-13.2 SMD1206-050-15 SMD1206-050-16	7"REEL	4,500
		Others	7"REEL	3,500

SMD1206 SERIES

Surface Mount PTC Device

Physical Dimensions & Recommended Pad Layout



Part Number	A		B		C		D	E
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Min.
SMD1206-003-60	3.00	3.60	1.50	1.90	0.50	1.20	0.15	0.10
SMD1206-005-24	3.00	3.60	1.50	1.90	0.60	1.20	0.15	0.10
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
SMD1206-010-24	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
SMD1206-012-24	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
SMD1206-016-24	3.00	3.60	1.50	1.90	0.40	1.00	0.15	0.10
SMD1206-016-30	3.00	3.60	1.50	1.90	0.40	1.00	0.15	0.10
SMD1206-016-60	3.00	3.60	1.50	1.90	0.6	1.20	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
SMD1206-020-33	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
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
SMD1206-030-30	3.00	3.60	1.50	1.90	0.50	1.20	0.15	0.10
SMD1206-035-6	3.00	3.60	1.50	1.90	0.35	0.80	0.15	0.10
SMD1206-035-16	3.00	3.60	1.50	1.90	0.35	0.80	0.15	0.10
SMD1206-035-24	3.00	3.60	1.50	1.90	0.40	0.90	0.15	0.10
SMD1206-035-30	3.00	3.60	1.50	1.90	0.40	1.20	0.15	0.10
SMD1206-035-33	3.00	3.60	1.50	1.90	0.40	1.20	0.15	0.10
SMD1206-050-6	3.00	3.60	1.50	1.90	0.35	0.80	0.15	0.10
SMD1206-050-9	3.00	3.60	1.50	1.90	0.35	0.80	0.15	0.10
SMD1206-050-13.2	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

● Physical Dimensions & Recommended Pad Layout

Part Number	A		B		C		D	E
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Min.
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
SMD1206-075-24	3.00	3.60	1.50	1.90	0.60	1.20	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
SMD1206-110-24	3.00	3.60	1.50	1.90	0.70	1.30	0.15	0.10
SMD1206-110-30	3.00	3.60	1.50	1.90	0.70	1.30	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
SMD1206-200-13.2	3.00	3.60	1.50	1.90	1.00	1.60	0.15	0.10
SMD1206-200-16	3.00	3.60	1.50	1.90	1.00	1.60	0.15	0.10
SMD1206-260-6	3.00	3.60	1.50	1.90	1.00	1.60	0.15	0.10
SMD1206-260-12	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.