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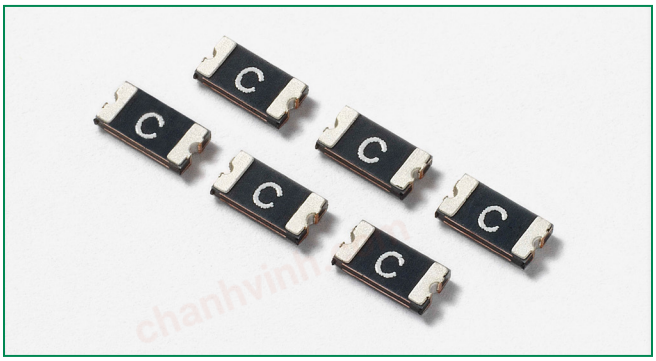
POLY-FUSE® Resettable PTCs

Surface Mount > 1206L Series

1206L Series



Description

The 1206L Series PTC provides surface mount overcurrent protection for applications where space is at a premium and resettable protection is desired.

Features

- RoHS compliant, lead-free and halogen-free
- Fast response to fault currents
- Compact design saves board space
- Low resistance
- Low-profile
- Compatible with high temperature solders

Agency Approvals

AGENCY	AGENCY FILE NUMBER
c UL us	E183209
	R50119118

Applications

- USB peripherals
- Disk drives
- CD-ROMs
- Plug and play protection for motherboards and peripherals
- Mobile phones - battery and port protection
- Disk drives
- PDAs / digital cameras
- Game console port protection

Electrical Characteristics

Part Number	Marking	I_{hold} (A)	I_{trip} (A)	V_{max} (Vdc)	I_{max} (A)	P_d typ. (W)	Maximum Time To Trip		Resistance		Agency Approvals	
							Current (A)	Time (Sec.)	R_{min} (Ω)	R_{1max} (Ω)	c UL us	
1206L005/60	f6	0.05	0.15	60	10	0.6	0.25	1.50	3.60	20.00		
1206L010/60	n6	0.10	0.25	60	10	0.6	0.50	1.50	1.50	10.00		
1206L012	A	0.125	0.29	30	100	0.6	1.00	0.20	1.500	6.000	X	X
1206L016	B	0.16	0.37	30	100	0.6	1.00	0.30	1.200	4.500	X	X
1206L020[1,2]	C	0.20	0.42	24	100	0.6	8.00	0.10	0.650	2.600	X	X
1206L025[1]	D	0.25	0.50	16	100	0.6	8.00	0.08	0.550	2.300	X	X
1206L035[1]	E	0.35	0.75	6	100	0.6	8.00	0.10	0.300	1.200	X	X
1206L035/16	J	0.35	0.75	16	100	0.6	8.00	0.10	0.300	1.200	X	X
1206L035/30	J3	0.35	0.75	30	100	0.6	8.00	0.10	0.30	1.20		
1206L050[1]	F	0.50	1.00	6	100	0.6	8.00	0.10	0.150	0.700	X	X
1206L050/15	M	0.50	1.00	15	100	0.6	8.00	0.10	0.150	0.750	X	X
1206L050/24	F2	0.50	1.00	24	100	0.6	8.00	0.10	0.15	0.75		
1206L075/13.2	G1	0.75	1.50	13.2	100	0.6	8.00	0.20	0.090	0.350	X	X
1206L075/16	GF	0.75	1.50	16	100	0.6	8.00	0.20	0.090	0.2900	X	X
1206L075TH[1]	G	0.75	1.50	8	100	0.6	8.00	0.20	0.090	0.290	X	X
1206L110TH[1]	H	1.10	2.20	8	100	0.8	8.00	0.10	0.040	0.210	X	X
1206L150TH[1]	K	1.50	3.00	8	100	0.8	8.00	0.30	0.040	0.120	X	X
1206L175	V	1.75	3.50	6	100	0.8	8.00	0.50	0.020	0.090	X	X
1206L200	L	2.00	3.50	6	100	0.8	8.00	1.50	0.018	0.080	X	X

I_{hold} = Hold current: maximum current device will pass without tripping in 20°C still air.
I_{trip} = Trip current: minimum current at which the device will trip in 20°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 = Power dissipated from device when in the tripped state at 20°C still air.
R_{min} = Minimum resistance of device in initial (un-soldered) state.
R_{typ} = Typical resistance of device in initial (un-soldered) state.
R_{1max} = Maximum resistance of device at 20°C measured one hour after tripping or reflow soldering of 260°C for 20 sec.

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

1 Some older references to these devices may include "**–C**" in the Part Number. The "**–C**" should be omitted when placing new orders for the device.
2 Part Number tested and complied with AEC-Q200.

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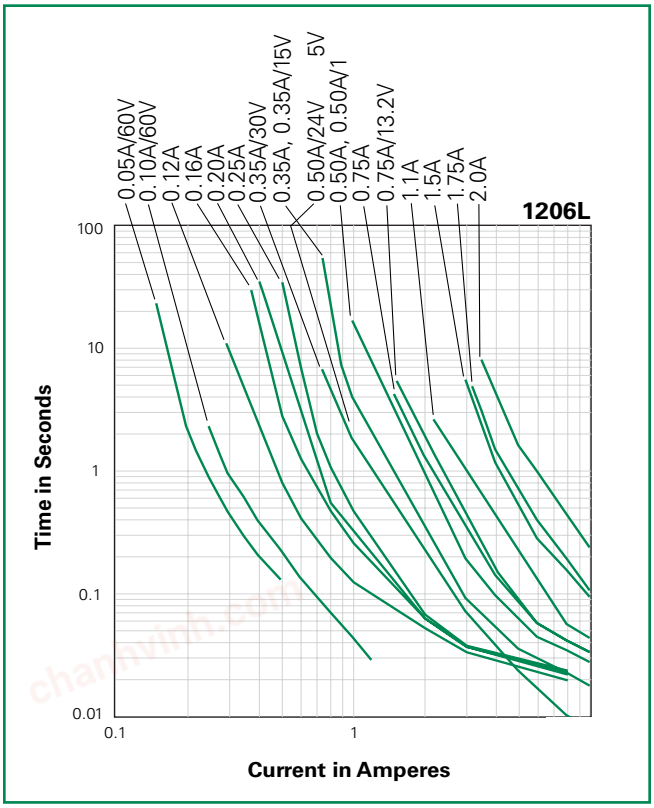
Temperature Rerating

	Ambient Operation Temperature								
	-40°C	-20°C	0°C	20°C	40°C	50°C	60°C	70°C	85°C
Part Number	Hold Current (A)								
1206L005/60	0.076	0.068	0.060	0.050	0.043	0.038	0.033	0.028	0.023
1206L010/60	0.15	0.14	0.12	0.10	0.084	0.075	0.065	0.055	0.042
1206L012	0.18	0.16	0.14	0.125	0.10	0.09	0.08	0.07	0.05
1206L016	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.09	0.08
1206L020	0.28	0.25	0.23	0.20	0.17	0.15	0.14	0.12	0.09
1206L025	0.37	0.33	0.29	0.25	0.22	0.20	0.17	0.15	0.12
1206L035	0.50	0.45	0.40	0.35	0.30	0.27	0.24	0.21	0.15
1206L035/16	0.50	0.45	0.40	0.35	0.30	0.27	0.24	0.21	0.15
1206L035/30	0.51	0.46	0.41	0.35	0.30	0.27	0.25	0.21	0.18
1206L050	0.71	0.64	0.57	0.50	0.42	0.39	0.35	0.31	0.25
1206L050/15	0.71	0.64	0.57	0.50	0.42	0.39	0.35	0.31	0.25
1206L050/24	0.76	0.68	0.60	0.50	0.43	0.38	0.33	0.29	0.24
1206L075/13.2	1.14	1.04	0.88	0.75	0.65	0.59	0.54	0.49	0.41
1206L075/16	1.01	0.94	0.86	0.75	0.65	0.60	0.54	0.46	0.37
1206L075TH	1.14	1.01	0.88	0.75	0.65	0.59	0.54	0.49	0.41
1206L110TH	1.64	1.46	1.30	1.10	0.92	0.83	0.80	0.65	0.52
1206L150TH	2.20	1.99	1.77	1.50	1.34	1.23	1.10	1.01	0.84
1206L175	2.50	2.25	2.00	1.75	1.55	1.45	1.35	1.25	1.10
1206L200	2.60	2.44	2.35	2.00	1.78	1.67	1.50	1.45	1.10

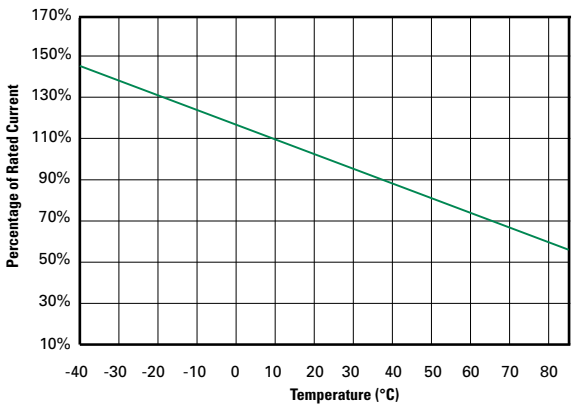
Notes: The temperature rerating data is only for reference, please contact Littelfuse technical support for detail temperature rerating information.

Average Time Current Curves



The average time current curves and Temperature Rerating curve performance is affected by a number or variables, and these curves provided as guidance only. Customer must verify the performance in their application.

Temperature Rerating Curve



Additional Information

Datasheet | Resources | Samples

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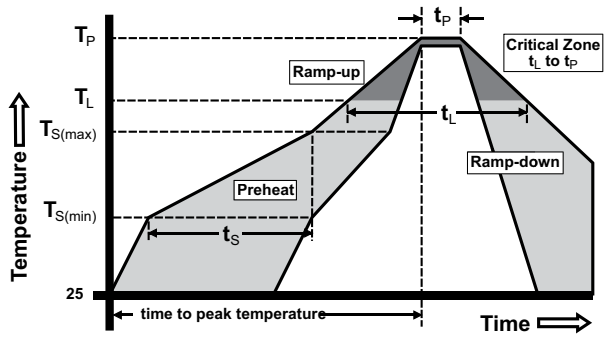
Soldering Parameters

Profile Feature		Pb-Free Assembly
Average Ramp-Up Rate ($T_{S(max)}$ to T_P)		3°C/second max
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 seconds
Peak / Classification Temperature (T_P)		$260^{+0/-5}$ °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 (T_P)		8 minutes Max.



- All temperature refer to topside of the package, 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, N_2 environment for lead
- Recommended maximum paste thickness is 0.25mm (0.010inch)
- Devices can be cleaned using standard industry methods and solvents
- Devices can be reworked using the standard industry practices

Physical Specifications

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

Environmental Specifications

Operating/Storage 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/-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

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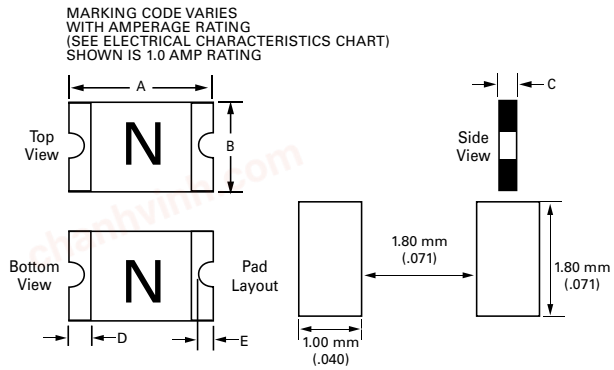
Dimensions



Part Number	A				B				C				D				E			
	Inches		mm		Inches		mm		Inches		mm		Inches		mm		Inches		mm	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
1206L005/60									0.03	0.05	0.65	1.25								
1206L010/60									0.03	0.05	0.65	1.25								
1206L012									0.03	0.06	0.65	1.45								
1206L016									0.03	0.06	0.65	1.45								
1206L020									0.02	0.04	0.50	1.00								
1206L025									0.02	0.04	0.5	1.00								
1206L035									0.02	0.03	0.45	0.75								
1206L035/16									0.02	0.03	0.45	0.75								
1206L035/30									0.02	0.04	0.50	1.00								
1206L050									0.02	0.03	0.45	0.75								
1206L050/15	0.12	0.13	3.00	3.40	0.06	0.07	1.50	1.80	0.02	0.03	0.45	0.75	0.01	0.03	0.25	0.75	0.002	0.018	0.05	0.45
1206L050/24									0.03	0.05	0.75	1.25								
1206L075/13.2									0.03	0.05	0.75	1.25								
1206L075/16									0.03	0.05	0.75	1.25								
1206L075TH									0.02	0.03	0.40	0.75								
1206L110TH									0.01	0.02	0.30	0.60								
1206L150TH									0.02	0.04	0.50	1.00								
1206L175									0.03	0.08	0.80	1.80								
1206L200									0.03	0.07	0.80	1.60								

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 performance 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.

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Part Ordering Number System

1206 L 380 /12 TH Y R - A

- **-A:** Automotive grade
  Blank: Standard version
- **PACKAGING STYLE**
  R: Tape & Reel
- **QUANTITY CODE: K**=10,000 **Y**=4,000 **W**=3,000 **P**=2,000
- **THIN PROFILE**
  (Not applicable to all parts)
- **/XX: SPECIAL VOLTAGE RATING**
  (Not applicable to all parts. Refer to Electrical Characteristics Table)
- **I_{HOLD} HOLD CURRENT CODE**
  (Refer to Electrical Characteristics Table)
- **L: LITTELFUSE SURFACE MOUNT PPTC**
- **SIZE**

SERIES

Packaging Options

Part Number	Ordering Number	Halogen Free	I_{hold} (A)	I_{hold} Code	Packaging Option	Quantity	Quantity/Pack Code
1206L005/60	1206L005/60WR	Yes	0.05	050	Tape and Reel	3000	WR
1206L010/60	1206L010/60WR	Yes	0.10	100	Tape and Reel	3000	WR
1206L012	1206L012WR	Yes	0.125	012	Tape and Reel	3000	WR
1206L016	1206L016WR	Yes	0.16	016	Tape and Reel	3000	WR
1206L020	1206L020YR	Yes	0.20	020	Tape and Reel	4000	YR
1206L025	1206L025YR	Yes	0.25	025	Tape and Reel	4000	YR
1206L035	1206L035YR	Yes	0.35	035	Tape and Reel	4000	YR
1206L035/16	1206L035/16YR	Yes	0.35	035	Tape and Reel	4000	YR
1206L035/30	1206L035/30WR	Yes	0.35	350	Tape and Reel	3000	WR
1206L050	1206L050YR	Yes	0.50	050	Tape and Reel	4000	YR
1206L050/15	1206L050/15YR	Yes	0.50	050	Tape and Reel	4000	YR
1206L050/24	1206L050/24WR	Yes	0.50	500	Tape and Reel	3000	WR
1206L075/13.2	1206L075/13.2WR	Yes	0.75	075	Tape and Reel	3000	WR
1206L075/16	1206L075/16WR	Yes	0.08	75	Tape and Reel	3,000	WR
1206L075TH	1206L075THYR	Yes	0.75	075	Tape and Reel	4000	YR
1206L110TH	1206L110THYR	Yes	1.10	110	Tape and Reel	4000	YR
1206L150TH	1206L150THWR	Yes	1.50	150	Tape and Reel	3000	WR
1206L175	1206L175PR	Yes	1.75	175	Tape and Reel	2000	PR
1206L200	1206L200PR	Yes	2.00	200	Tape and Reel	2000	PR

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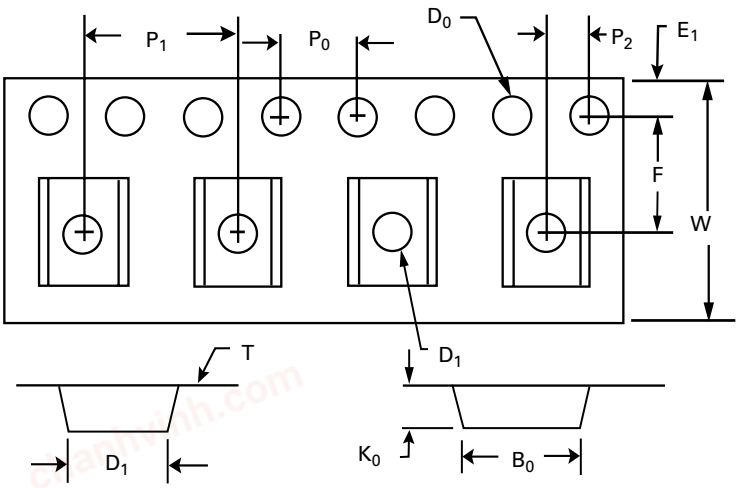
Tape and Reel Specifications

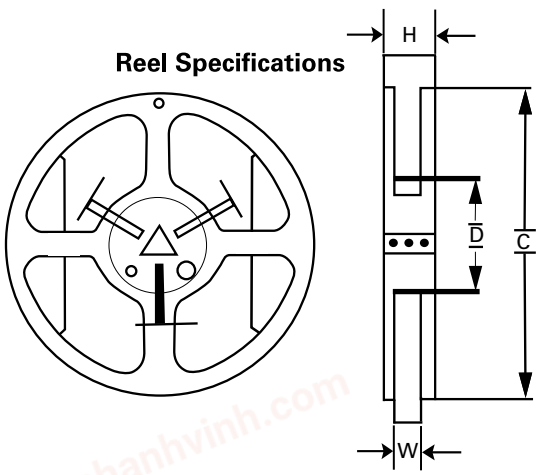
TAPE SPECIFICATIONS: EIA-481-1 (mm)			
	Packaging Code "YR": 1206L020, 1206L025, 1206L035, 1206L035/16, 1206L050, 1206L050/15, 1206L075TH, 1206L110TH	**Packaging Code "WR":** 1206L005/60, 1206L010/60, 1206L012, 1206L016, 1206L035/30, 1206L050/15, 1206L050/24, 1206L075/13.6, 1206L150TH	**Packaging Code "PR":** 1206L175, 1206L200
W	8.20+0.10/-0.30	8.15+0.15/-0.30	8.20+0.10/-0.30
F	3.50+/-0.05	3.50+/-0.05	3.50+/-0.05
E_1	1.75+/-0.10	1.75+/-0.10	1.75+/-0.10
D_0	1.55+/-0.05	1.55+/-0.05	1.55+/-0.05
D_1	1.00+/-0.10	1.00+/-0.10	1.00+/-0.10
P_0	4.00+/-0.10	4.00+/-0.10	4.00+/-0.10
P_1	4.00+/-0.10	4.00+/-0.10	4.00+/-0.10
P_2	2.00+/-0.05	2.00+/-0.05	2.00+/-0.05
A_0	1.95+/-0.10	1.95+/-0.10	1.95+/-0.10
B_0	3.65+/-0.10	3.65+/-0.10	3.65+/-0.10
T	0.25+/-0.10	0.25+/-0.10	0.25+/-0.10
K_0	0.87+/-0.10	1.30+/-0.10	1.70+/-0.10
Leader min.	390	390	390
Trailer min.	160	160	160

REEL DIMENSIONS: EIA-481-1 (mm)	
C	Ø178+/–1.0
D	Ø60.2+/–0.5
H	11.0+/-0.5
W	9.0+/-1.5

Tape Specifications



Reel Specifications



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