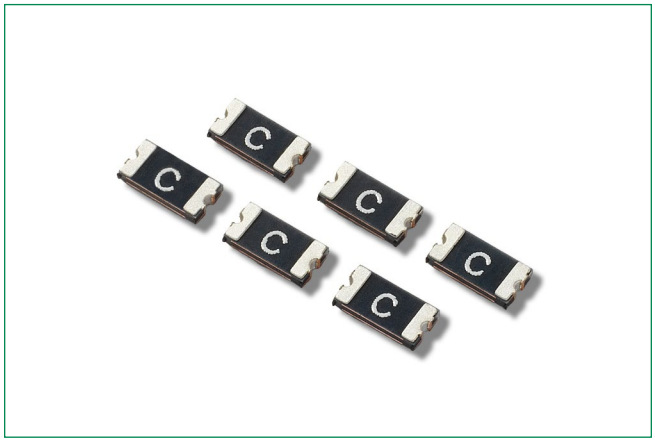
1206L Series
Surface Mount



Description

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

Features and Benefits

- 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

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

Web Resources

Download ECAD models, order samples, and find technical recources at www.littelfuse.com

Agency Approvals

Agency	Agency File Number
c UL us	E183209
	R50119118

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	
1206L005/30	f3	0.05	0.15	30	40	0.6	0.25	1.50	3.60	20.00	X	X
1206L005/60	f6	0.05	0.15	60	10	0.6	0.25	1.50	3.60	20.00	X	X
1206L010/30	n3	0.10	0.25	30	40	0.6	0.50	1.50	1.50	10.00	X	X
1206L010/60	n6	0.10	0.25	60	10	0.6	0.50	1.50	1.50	10.00	X	X
1206L012/48	U	0.125	0.29	48	10	0.6	1.00	0.20	1.50	6.00	X	X
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
1206L020/30	C3	0.20	0.42	30	100	0.6	8.00	0.10	0.65	2.60	X	X
1206L020[1,2]	C	0.20	0.42	24	100	0.6	8.00	0.10	0.650	2.600	X	X
1206L025/24	D2	0.25	0.55	24	100	0.6	8.00	0.08	0.55	2.30	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	X	X
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	X	X
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
1206L110/16	HF	1.10	2.20	16	100	0.8	8.00	0.10	0.060	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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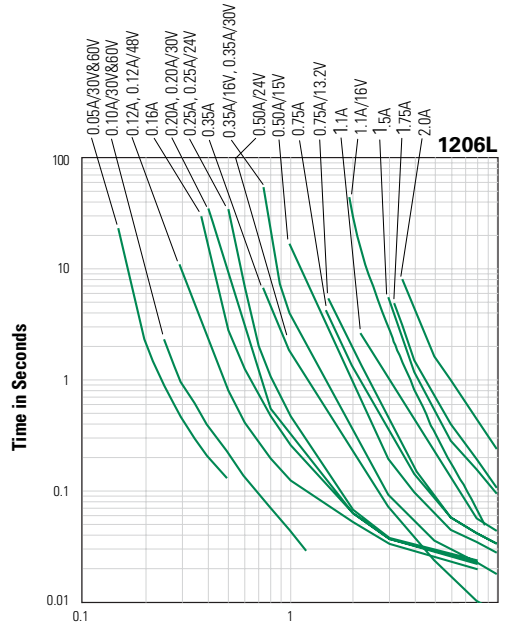
Temperature Rerating

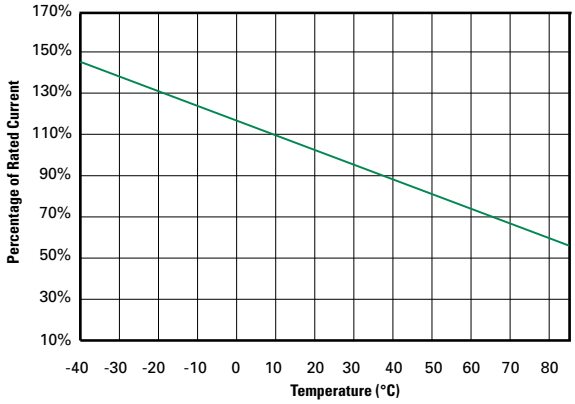
Ambient Operation Temperature									
-	-40°C	-20°C	0°C	20°C	40°C	50°C	60°C	70°C	85°C
Part Number	**Hold Current (A)**								
1206L005/30	0.076	0.068	0.060	0.050	0.043	0.039	0.034	0.030	0.023
1206L005/60	0.076	0.068	0.060	0.050	0.043	0.039	0.034	0.030	0.023
1206L010/30	0.156	0.139	0.120	0.100	0.083	0.074	0.065	0.056	0.042
1206L010/60	0.15	0.14	0.12	0.10	0.083	0.074	0.065	0.056	0.042
1206L012/48	0.18	0.16	0.14	0.125	0.10	0.09	0.08	0.07	0.05
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
1206L020/30	0.28	0.25	0.23	0.20	0.17	0.15	0.14	0.12	0.09
1206L020	0.28	0.25	0.23	0.20	0.17	0.15	0.14	0.12	0.09
1206L025/24	0.37	0.33	0.29	0.25	0.22	0.20	0.17	0.15	0.12
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	0.50	0.45	0.40	0.35	0.30	0.27	0.24	0.21	0.15
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	0.71	0.64	0.57	0.50	0.42	0.39	0.35	0.31	0.25
1206L075/13.2	1.14	1.04	0.88	0.75	0.65	0.59	0.54	0.49	0.41
1206L075/16	1.14	1.01	0.88	0.75	0.65	0.59	0.54	0.49	0.41
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
1206L110/16	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



Temperature Rerating Curve



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.

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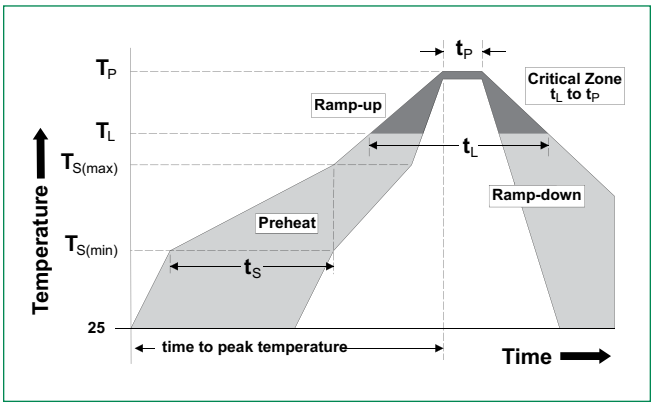
Soldering Parameters

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.



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/-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

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.

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**

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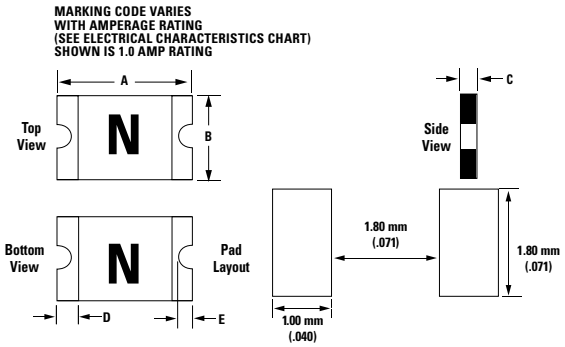
Dimensions



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
1206L005/30									0.03	0.04	0.65	1.10								
1206L005/60									0.03	0.05	0.65	1.25								
1206L010/30									0.03	0.04	0.65	1.10								
1206L010/60									0.03	0.05	0.65	1.25								
1206L012/48									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								
1206L020/30									0.02	0.04	0.50	1.00								
1206L020									0.02	0.04	0.50	1.00								
1206L025/24									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	0.12	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
1206L035/30									0.02	0.04	0.50	1.00								
1206L050									0.02	0.03	0.45	0.75								
1206L050/15									0.02	0.03	0.45	0.75								
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								
1206L110/16									0.03	0.05	0.75	1.25								
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								

Packaging Options

Part Number	Ordering Number	Halogen Free	I_{hold} (A)	I_{hold} Code	Packaging Option	Quantity	Quantity/Pack Code
1206L005/30	1206L005/30WR		0.05	005		3,000	WR
1206L005/60	1206L005/60WR		0.05	005		3,000	WR
1206L010/30	1206L010/30WR		0.10	010		3,000	WR
1206L010/60	1206L010/60WR		0.10	010		3,000	WR
1206L012/48	1206L012/48WR		0.12	012		3,000	WR
1206L012	1206L012WR		0.125	012		3,000	WR
1206L016	1206L016WR		0.16	016		3,000	WR
1206L020/30	1206L020/30YR		0.20	020		4,000	YR
1206L020	1206L020YR		0.20	020		4,000	YR
1206L025/24	1206L025/24YR		0.25	025		4,000	YR
1206L025	1206L025YR		0.25	025		4,000	YR
1206L035	1206L035YR		0.35	035		4,000	YR
1206L035/16	1206L035/16YR	Yes	0.35	035	Tape and Reel	4,000	YR
1206L035/30	1206L035/30WR		0.35	035		3,000	WR
1206L050	1206L050YR		0.50	050		4,000	YR
1206L050/15	1206L050/15YR		0.50	050		4,000	YR
1206L050/24	1206L050/24WR		0.50	050		3,000	WR
1206L075/13.2	1206L075/13.2WR		0.75	075		3,000	WR
1206L075/16	1206L075/16WR		0.75	075		3,000	WR
1206L075TH	1206L075THYR		0.75	075		4,000	YR
1206L110TH	1206L110THYR		1.10	110		4,000	YR
1206L110/16	1206L110/16WR		1.10	110		3,000	WR
1206L150TH	1206L150THWR		1.50	150		3,000	WR
1206L175	1206L175PR		1.75	175		2,000	PR
1206L200	1206L200PR		2.00	200		2,000	PR

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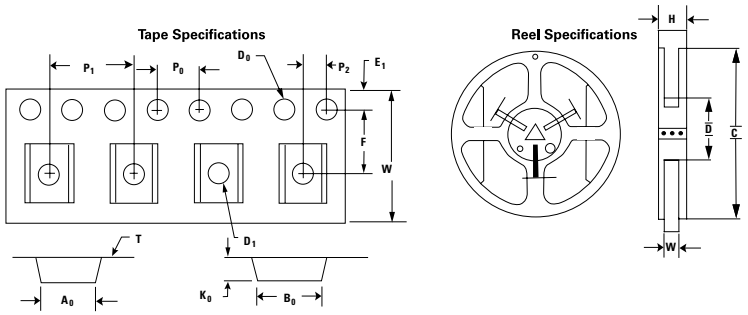
Tape and Reel Specifications

Tape Specifications: EIA-481-1 (mm)					
Value	**Packaging Code "YR"**		**Packaging Code "WR"**		**Packaging Code "PR"**
	1206L020 1206L020/30 1206L025 1206L025/24 1206L035 1206L035/16	**1206L050 1206L050/15 1206L075TH 1206L110TH**	**1206L005/30 1206L005/60 1206L010/30 1206L010/60 1206L012 1206L012/48 1206L016 1206L035/30**	**1206L050/24 1206L075/13.2 1206L075/16 1206L110/16 1206L150TH**	**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		1.92+/-0.10		1.95+/-0.10
B_0	3.65+/-0.10		3.65+/-0.10		3.65+/-0.10
T	0.20+/-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



Warning
- Users should independently evaluate the suitability of and test each product selected for their own application.
- Operation beyond the maximum ratings or improper use may result in device damage and possible electrical arcing and flame.
- These devices are intended for protection against damage caused by occasional overcurrent or overtemperature fault conditions and should not be used when repeated fault conditions or prolonged trip events are anticipated.
- Contamination of the PPTC material with certain silicone-based oils or some aggressive solvents can adversely impact the performance of the devices.
- Device performance can be impacted negatively if devices are handled in a manner inconsistent with recommended electronic, thermal, and mechanical procedures for electronic components.
- PPTC devices are not recommended for installation in applications where the device is constrained such that its PTC properties are inhibited, for example in rigid potting materials or in rigid housings, which lack adequate clearance to accommodate device expansion.
- Operation in circuits with a large inductance can generate a circuit voltage (Ldi/dt) above the rated voltage of the device.

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