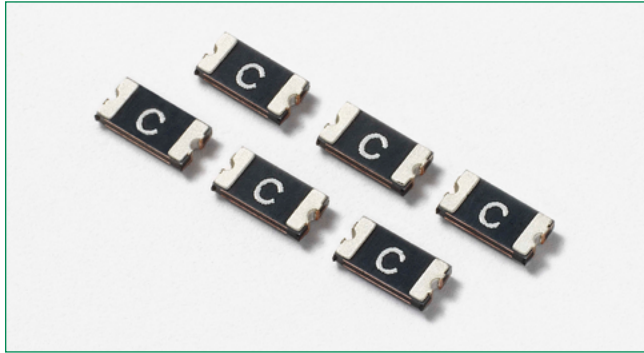


### 1206L Series



#### 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



#### 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

#### Agency Approvals

Agency	Agency File Number
	E183209
	R50119118

#### Electrical Characteristics

Part Number	Marking	I <sub>hold</sub> (A)	I <sub>trip</sub> (A)	V <sub>max</sub> (Vdc)	I <sub>max</sub> (A)	P <sub>d</sub> typ. (W)	Maximum Time To Trip		Resistance		Agency Approvals	
							Current (A)	Time (Sec.)	R <sub>min</sub> (Ω)	R <sub>1max</sub> (Ω)		
1206L005/60	f6	0.05	0.15	60	10	0.6	0.25	1.50	3.60	20.00	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 <sup>1,2</sup>	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 <sup>1</sup>	D	0.25	0.50	16	100	0.6	8.00	0.08	0.550	2.300	X	X
1206L035 <sup>1</sup>	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 <sup>1</sup>	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 <sup>1</sup>	G	0.75	1.50	8	100	0.6	8.00	0.20	0.090	0.290	X	X
1206L110TH <sup>1</sup>	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 <sup>1</sup>	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<sub>hold</sub> = Hold current: maximum current device will pass without tripping in 20°C still air.  
 I<sub>trip</sub> = Trip current: minimum current at which the device will trip in 20°C still air.  
 V<sub>max</sub> = Maximum voltage device can withstand without damage at rated current (I<sub>max</sub>)  
 I<sub>max</sub> = Maximum fault current device can withstand without damage at rated voltage (V<sub>max</sub>)  
 P<sub>d</sub> = Power dissipated from device when in the tripped state at 20°C still air.

R<sub>min</sub> = Minimum resistance of device in initial (un-soldered) state.  
 R<sub>typ</sub> = Typical resistance of device in initial (un-soldered) state.  
 R<sub>1max</sub> = 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.

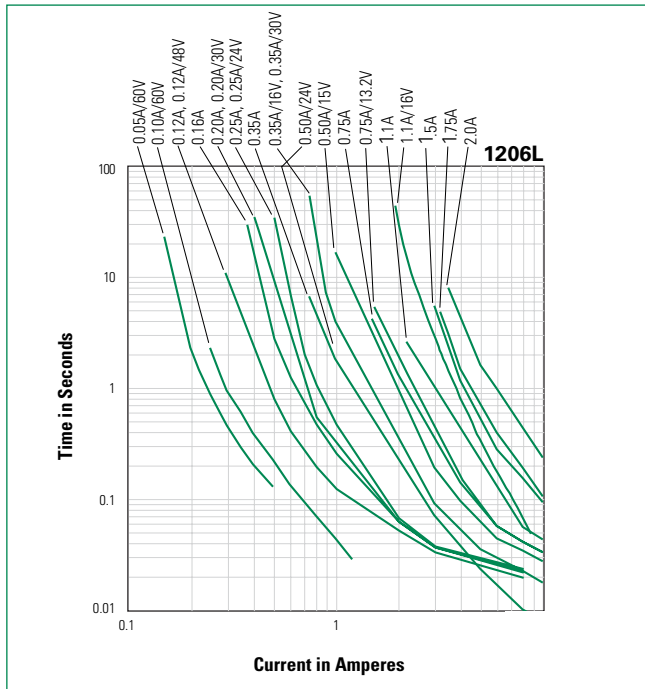
1. Some older references to these devices may include "-C" in the Part Number. The "-C" should be omitted when placing new orders for the device.
2. Part Number tested and complied with AEC-Q200.

**Temperature Derating**

Part Number	Ambient Operation Temperature								
	-40°C	-20°C	0°C	20°C	40°C	50°C	60°C	70°C	85°C
	Hold Current (A)								
1206L005/60	0.076	0.068	0.060	0.050	0.043	0.039	0.034	0.030	0.023
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

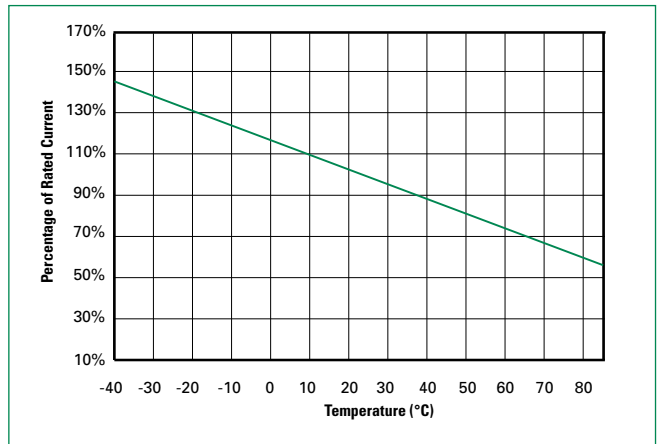
**Notes:** The temperature derating data is only for reference, please contact Littelfuse technical support for detail temperature derating information.

**Average Time Current Curves**



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

**Temperature Derating Curve**



**Additional Information**



**Datasheet**



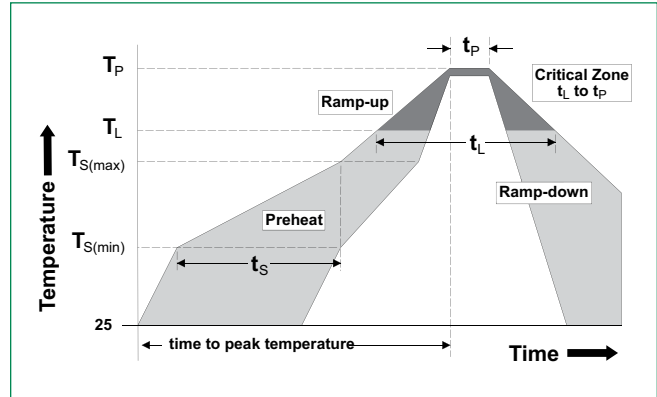
**Resources**



**Samples**

### Soldering Parameters

<b>Profile Feature</b>	Pb-Free Assembly	
<b>Average Ramp-Up Rate (<math>T_{S(max)}</math> to <math>T_p</math>)</b>	3°C/second max	
<b>Pre Heat:</b>	<b>Temperature Min (<math>T_{s(min)}</math>)</b>	150°C
	<b>Temperature Max (<math>T_{s(max)}</math>)</b>	200°C
	<b>Time (Min to Max) (<math>t_s</math>)</b>	60 – 180 secs
<b>Time Maintained Above:</b>	<b>Temperature (<math>T_L</math>)</b>	217°C
	<b>Temperature (<math>T_L</math>)</b>	60 – 150 seconds
<b>Peak / Classification Temperature (<math>T_p</math>)</b>	260 <sup>+0/-5</sup> °C	
<b>Time within 5°C of actual peak Temperature (<math>t_p</math>)</b>	20 – 40 seconds	
<b>Ramp-down Rate</b>	6°C/second max	
<b>Time 25°C to peak Temperature (<math>T_p</math>)</b>	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

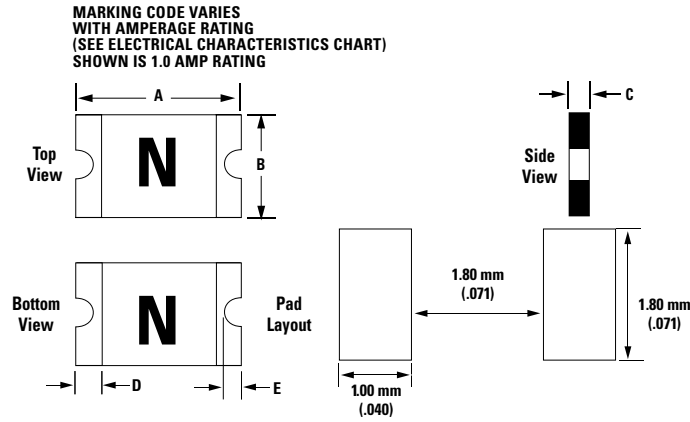
### Physical Specifications

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

### Environmental Specifications

<b>Operating/Storage Temperature</b>	-40°C to +85°C
<b>Maximum Device Surface Temperature in Tripped State</b>	125°C
<b>Passive Aging</b>	+85°C, 1000 hours -/+5% typical resistance change
<b>Humidity Aging</b>	+85°C, 85% R.H., 1000 hours -/+5% typical resistance change
<b>Thermal Shock</b>	MIL-STD-202, Method 107 +85°C/-40°C 20 times -30% typical resistance change
<b>Solvent Resistance</b>	MIL-STD-202, Method 215 No change
<b>Vibration</b>	MIL-STD-883, Method 2007, Condition A No change
<b>Moisture Sensivity Level</b>	Level 1, J-STD-020

**Dimensions**

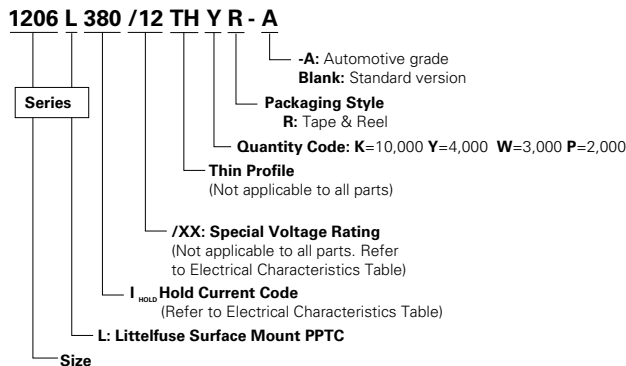


Part Number	A		B		C		D		E												
	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm											
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max											
1206L005/60																					
1206L010/60																					
1206L012/48																					
1206L012																					
1206L016																					
1206L020/30																					
1206L020																					
1206L025/24																					
1206L025																					
1206L035																					
1206L035/16																					
1206L035/30	0.12	0.13	3.00	3.40	0.06	0.07	1.50	1.80	0.02	0.04	0.50	1.00	0.01	0.03	0.25	0.75	0.002	0.018	0.05	0.45	
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									

**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.

**Part Ordering Number System**

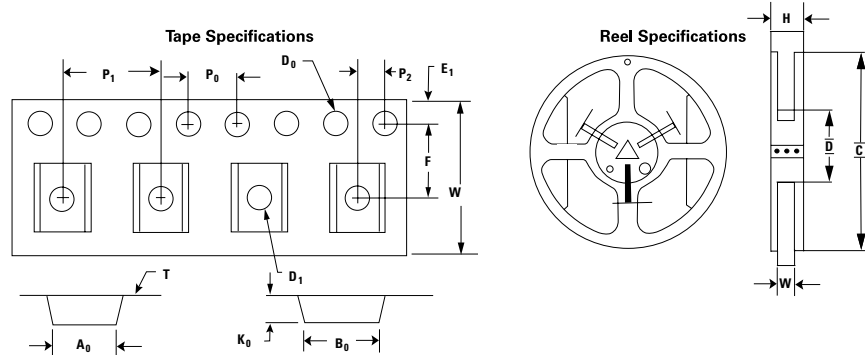


**Packaging Options**

Part Number	Ordering Number	Halogen Free	I <sub>hold</sub> (A)	I <sub>hold</sub> Code	Packaging Option	Quantity	Quantity/Pack Code
1206L005/60	1206L005/60VVR	Yes	0.05	050	Tape and Reel	3000	WR
1206L010/60	1206L010/60VVR		0.10	100		3000	WR
1206L012/48	1206L012/48VVR		0.12	012		3,000	WR
1206L012	1206L012VVR		0.125	012		3000	WR
1206L016	1206L016VVR		0.16	016		3000	WR
1206L020/30	1206L020/30YR		0.20	020		4,000	YR
1206L020	1206L020YR		0.20	020		4000	YR
1206L025/24	1206L025/24YR		0.25	025		4,000	YR
1206L025	1206L025YR		0.25	025		4000	YR
1206L035	1206L035YR		0.35	035		4000	YR
1206L035/16	1206L035/16YR		0.35	035		4000	YR
1206L035/30	1206L035/30VVR		0.35	350		3000	WR
1206L050	1206L050YR		0.50	050		4000	YR
1206L050/15	1206L050/15YR		0.50	050		4000	YR
1206L050/24	1206L050/24VVR		0.50	500		3000	WR
1206L075/13.2	1206L075/13.2VVR		0.75	075		3000	WR
1206L075/16	1206L075/16VVR		0.75	075		3,000	WR
1206L075TH	1206L075THYR		0.75	075		4000	YR
1206L110TH	1206L110THYR		1.10	110		4000	YR
1206L110/16	1206L110/16VVR		1.10	110		3000	WR
1206L150TH	1206L150THVVR	1.50	150	3000	WR		
1206L175	1206L175PR	1.75	175	2000	PR		
1206L200	1206L200PR	2.00	200	2000	PR		

**Tape and Reel Specifications**

Tape Specifications: EIA-481-1 (mm)						Reel Dimensions: 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	1206L005/60 1206L010/60 1206L012 1206L012/48 1206L016 1206L035/30	1206L050/24 1206L075/13.2 1206L075/16 1206L110/16 1206L150TH	1206L175 1206L200	<table border="1"> <tr><td><b>C</b></td><td>Ø178+/-1.0</td></tr> <tr><td><b>D</b></td><td>Ø60.2+/-0.5</td></tr> <tr><td><b>H</b></td><td>11.0+/-0.5</td></tr> <tr><td><b>W</b></td><td>9.0+/-1.5</td></tr> </table>	<b>C</b>	Ø178+/-1.0	<b>D</b>	Ø60.2+/-0.5	<b>H</b>	11.0+/-0.5	<b>W</b>
<b>C</b>	Ø178+/-1.0													
<b>D</b>	Ø60.2+/-0.5													
<b>H</b>	11.0+/-0.5													
<b>W</b>	9.0+/-1.5													
<b>W</b>	8.20+0.10/-0.30		8.15+0.15/-0.30		8.20+0.10/-0.30									
<b>F</b>	3.50+/-0.05		3.50+/-0.05		3.50+/-0.05									
<b>E<sub>1</sub></b>	1.75+/-0.10		1.75+/-0.10		1.75+/-0.10									
<b>D<sub>0</sub></b>	1.55+/-0.05		1.55+/-0.05		1.55+/-0.05									
<b>D<sub>1</sub></b>	1.00+/-0.10		1.00+/-0.10		1.00+/-0.10									
<b>P<sub>0</sub></b>	4.00+/-0.10		4.00+/-0.10		4.00+/-0.10									
<b>P<sub>1</sub></b>	4.00+/-0.10		4.00+/-0.10		4.00+/-0.10									
<b>P<sub>2</sub></b>	2.00+/-0.05		2.00+/-0.05		2.00+/-0.05									
<b>A<sub>0</sub></b>	1.95+/-0.10		1.92+/-0.10		1.95+/-0.10									
<b>B<sub>0</sub></b>	3.65+/-0.10		3.65+/-0.10		3.65+/-0.10									
<b>T</b>	0.20+/-0.10		0.25+/-0.10		0.25+/-0.10									
<b>K<sub>0</sub></b>	0.87+/-0.10		1.30+/-0.10		1.70+/-0.10									
Leader min.	390		390		390									
Trailer min.	160		160		160									



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