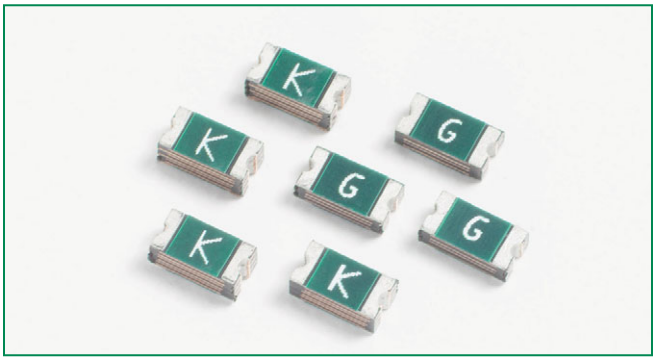
RoHS Pb HF 1206L Series



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[1]
- 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
c UL us	E183209
TÜV	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	TÜV
1206L012	A	0.125	0.29	30	100	0.6	1.00	0.20	1.500	6.00	X	X
1206L016	B	0.16	0.37	30	100	0.6	1.00	0.30	1.200	4.50	X	X
1206L020 [2]	C	0.20	0.42	24	100	0.6	8.00	0.10	0.650	2.60	X	X
1206L025 [2]	D	0.25	0.50	16	100	0.6	8.00	0.08	0.550	2.30	X	X
1206L035 [2]	E	0.35	0.75	6	100	0.6	8.00	0.10	0.300	1.20	X	X
1206L035/16	J	0.35	0.75	16	100	0.6	8.00	0.10	0.300	1.20	X	X
1206L050 [2]	F	0.50	1.00	6	100	0.6	8.00	0.10	0.150	0.70	X	X
1206L050/15	M	0.50	1.00	15	100	0.6	8.00	0.10	0.150	0.75	X	X
1206L075/13.2	G1	0.75	1.50	13.2	100	0.6	8.00	0.20	0.090	0.35	X	X
1206L075TH [2,3]	G	0.75	1.50	8	100	0.6	8.00	0.20	0.090	0.29	X	X
1206L110TH [2,3]	H	1.10	2.20	8	100	0.8	8.00	0.10	0.040	0.18	X	X
1206L150TH [2,3]	K	1.50	3.00	8	100	0.8	8.00	0.30	0.040	0.12	X	X
1206L175	V	1.75	3.50	6	100	0.8	8.00	0.50	0.020	0.09	X	X
1206L200	L	2.00	3.50	6	100	0.8	8.00	1.50	0.018	0.08	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 Effective September 15, 2009 onward, all 1206L PTC products will be manufactured Halogen Free (HF). Existing Non-Halogen Free 1206L PTC products will continue to be sold until supplies are depleted. Effective January 1, 2010, all 1206L PTC product will be manufactured and sold as Halogen Free by default, and the "HF" part number suffix code will be discontinued – Refer to Part Ordering Number System and Packaging Options sections for additional information.

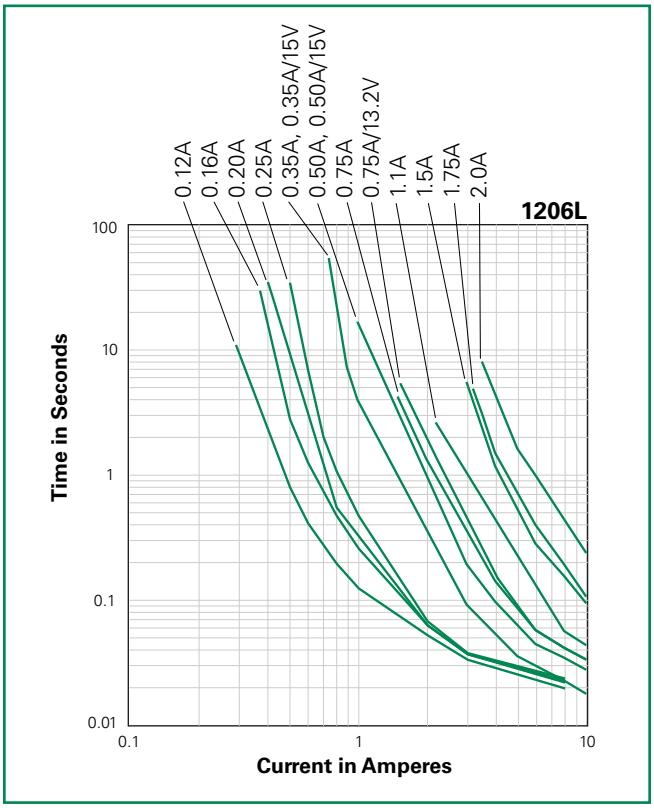
2 Some older references to these devices may include "**–C**" in the Part Number. The "**–C**" should be omitted when placing new orders for the device.

3 Part numbers ending in "**TH**" refer to new lower profile devices. For these items the "**TH**" **suffix must be included in the ordering instructions.** Please refer also to the Dimensions and Part Ordering Number System sections of this document for additional information. Orders for the original thicker product (No TH in part number) may be accepted in some instances through October 31, 2009. Please contact Littelfuse for additional information or arrangements.

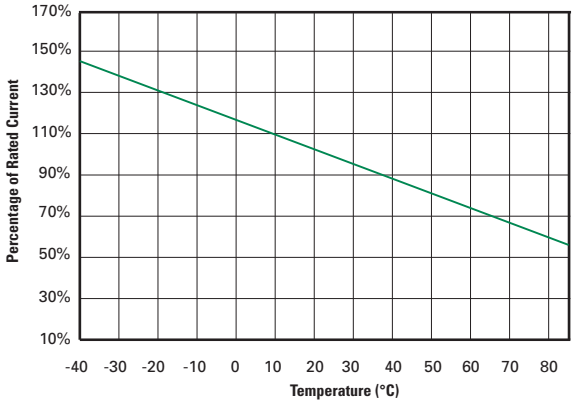
Temperature Rerating

	Ambient Operation Temperature								
	-40°C	-20°C	0°C	23°C	40°C	50°C	60°C	70°C	85°C
Part Number	Hold Current (A)								
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
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
1206L075/13.2	1.14	1.04	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	1.52	1.37	1.25	1.10	0.92	0.82	0.75	0.64	0.52
1206L150TH	2.18	1.94	1.72	1.50	1.28	1.17	1.06	0.96	0.77
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

Average Time Current Curves



Temperature Rerating Curve



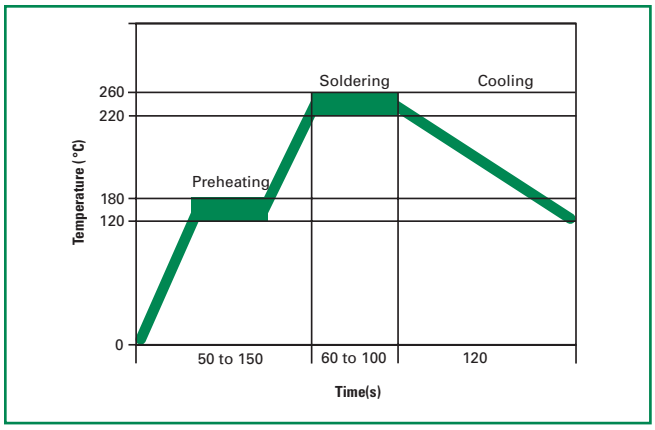
The average time current curves and Temperature Rerating curve performance is affected by a number or variables, and these curves provided as guidance only. Customer must verify the performance in their application.

Soldering Parameters

Condition	Reflow
Peak Temp/ Duration Time	260°C / 10 Sec
Time above liquids (TAL) 220°C	60 Sec ~ 100 Sec
Preheat 120°C~ 180°C	50 Sec ~ 150 Sec
Storage Condition	0°C~35°C, 70% RH

- Recommended reflow methods: IR, vapor phase oven, hot air oven, N_2 environment for lead–free
- Recommended maximum paste thickness is 0.25mm (0.010 inch)
- Devices can be cleaned using standard industry methods and solvents.

Note: If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.



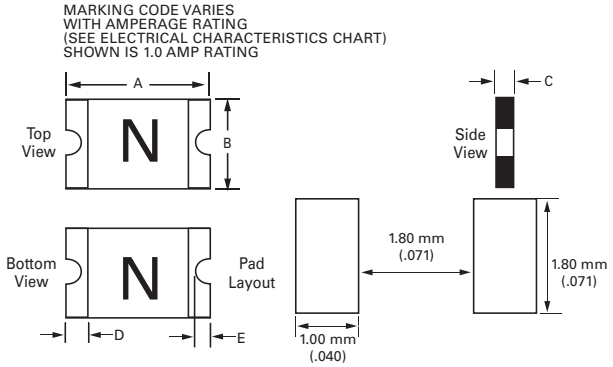
Physical Specifications

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 107G +85°C/-40°C 20 times -30% typical resistance change
Solvent Resistance	MIL–STD–202, Method 215 No change
Vibration	MIL–STD–883C, Method 2007.1, Condition A No change
Moisture Sensivity Level	Level 1, J–STD–020C

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
1206L012	0.12	0.14	3	3.5	0.06	0.07	1.5	1.8	0.03	0.06	0.65	1.45	0.01	0.03	0.25	0.75	0.004	0.02	0.1	0.45
1206L016									0.03	0.06	0.65	1.45								
1206L020									0.02	0.04	0.5	1								
1206L025									0.02	0.04	0.5	1								
1206L035									0.02	0.03	0.45	0.75								
1206L035/16									0.02	0.03	0.45	0.75								
1206L050									0.02	0.03	0.45	0.75								
1206L050/15									0.02	0.03	0.45	0.75								
1206L075/13.2									0.03	0.05	0.75	1.25								
1206L075TH									0.02	0.03	0.45	0.75								
1206L110TH		0.13		3.4					0.01	0.02	0.30	0.60								
1206L150TH									0.02	0.04	0.50	1								
1206L175									0.03	0.08	0.80	1.8								
1206L200									0.03	0.07	0.80	1.6								

Part Ordering Number System

1206 L xxx /xx TH Y R HF

- **HALOGEN FREE PRODUCT INDICATOR** — Required for some items. See Packaging section.
- **PACKAGING STYLE** — **R:** Tape & Reel
- **QUANTITY CODE: W**=3000 **Y**=4000 **P**=2000
- **LOW PROFILE DEVICE INDICATOR** — (Required, for L075, L110 and L150 device orders only. Refer to "C" in Dimensions section.)
- **SPECIAL VOLTAGE RATING ITEM** — (Applicable only to 1206L035/16 and 1206L050/15. Refer to Electrical Characteristics Table for additional information)
- **I_{HOLD} HOLD CURRENT CODE** — (Refer to Electrical Characteristics Table)
- **L: LITTELFUSE SURFACE MOUNT PPTC**
- **DEVICE SIZE CODE** (0.12 x 0.06 inch)

SERIES

Packaging Options

Part Number	Ordering Number	Halogen Free*	I_{hold} (A)	I_{hold} Code	Packaging Option	Quantity	Quantity/Pack Code
1206L012	1206L012WRHF	Yes	0.125	012	Tape and Reel	3000	WR
	1206L012WR	No					
1206L016	1206L016WRHF	Yes	0.16	016	Tape and Reel	3000	WR
	1206L016WR	No					
1206L020	1206L020YRHF	Yes	0.20	020	Tape and Reel	4000	YR
	1206L020YR	No					
1206L025	1206L025YRHF	Yes	0.25	025	Tape and Reel	4000	YR
	1206L025YR	No					
1206L035	1206L035YRHF	Yes	0.35	035	Tape and Reel	4000	YR
	1206L035YR	No					
1206L035/16	1206L035/16YRHF	Yes	0.35	035	Tape and Reel	4000	YR
	1206L035/16YR	No					
1206L050	1206L050YRHF	Yes	0.50	050	Tape and Reel	4000	YR
	1206L050YR	No					
1206L050/15	1206L050/15YRHF	Yes	0.50	050	Tape and Reel	4000	YR
	1206L050/15YR	No					
1206L075/13.2	1206L075/13.2WR	Yes	0.75	075	Tape and Reel	3000	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	**Packaging Code "WR":** 1206L012, 1206L016, 1206L110TH	**Packaging Code "PR":** 1206L150TH, 1206L160, 1206L175, 1206L200
W	8.15+0.15-0.30	8.00+/-0.30	8.15+0.15-0.30
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 (MIN)	1.00 (MIN)	1.00 (MIN)
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)	
H	16.0+/-0.2
W	9+/-0.5
D	Ø 60.2+/–0.5
F	Ø 13.0+/-0.5
C	Ø 178+/-1.0
H_1	11+/-0.5
W_1	2.5+0.5
W_2	3.0+0.5
W_3	4.0+0.5
W_4	5.0+0.5