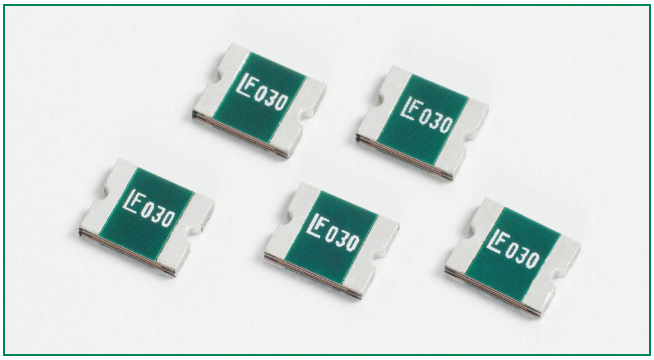
RoHS Pb HF 2016L Series



Description

The 2016L Series PTC provides surface mount overcurrent protection for low voltage (≤60V) applications where resettable protection is desired.

Features

- RoHS compliant, lead-free and halogen-free
- Fast response to fault currents
- High voltage
- Low-profile

Agency Approvals

AGENCY	AGENCY FILE NUMBER
c UL us	E183209
TÜV	R50119118

Applications

- IEE1394 port protection
- Powered ethernet port protection (IEEE 802.3 af)
- Automotive electronic control module protection
- Low voltage telecom equipment 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_{typ} (Ω)	R_{1max} (Ω)	c UL us	TÜV
2016L030	LF030	0.30	0.60	60	20	1.40	1.5	3.0	0.500	1.40	2.30	X	X
2016L050	LF050	0.55	1.10	60	20	1.40	2.5	5.0	0.200	0.70	1.00	X	X
2016L075/60	LF075-60	0.75	1.50	60	20	1.40	8.0	0.5	0.130	0.50	0.90	*	*
2016L100	LF100	1.10	2.20	15	40	1.40	8.0	0.5	0.100	0.25	0.40	X	X
2016L100/33	LF100-33	1.10	2.20	33	40	1.40	8.0	0.5	0.100	0.25	0.40	X	X
2016L150	LF150	1.50	3.00	15	40	1.40	8.0	1.0	0.070	0.13	0.18	X	X
2016L200	LF200	2.00	4.20	6	40	1.40	8.0	3.0	0.048	0.07	0.10	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.

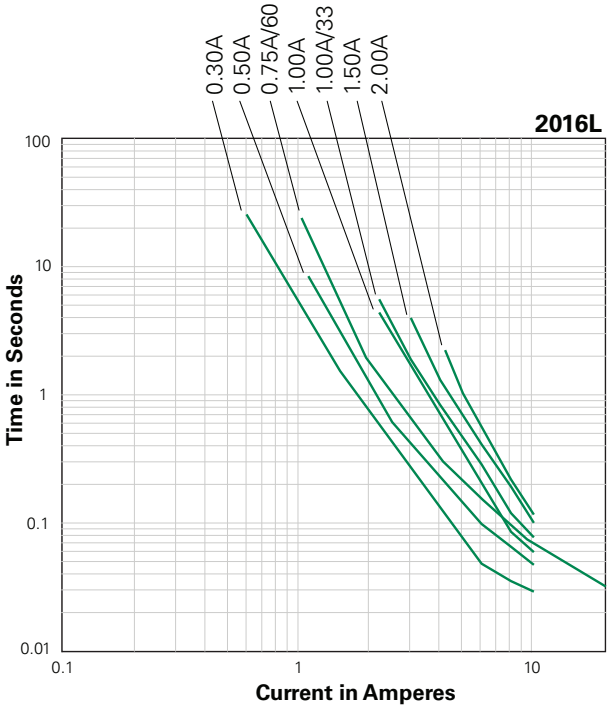
Effective September 15, 2009 onward, all 2016L PTC products will be manufactured Halogen Free (HF). Existing Non-Halogen Free 2016L PTC products will continue to be sold until supplies are depleted. Effective January 1, 2010, all 2016L PTC product will be manufactured and sold as Halogen Free by default, and the "HF" part number suffix code will be discontinued – Refer to Part Ordering Number System and Packaging Options sections for additional information.

* Agency Approval is Pending

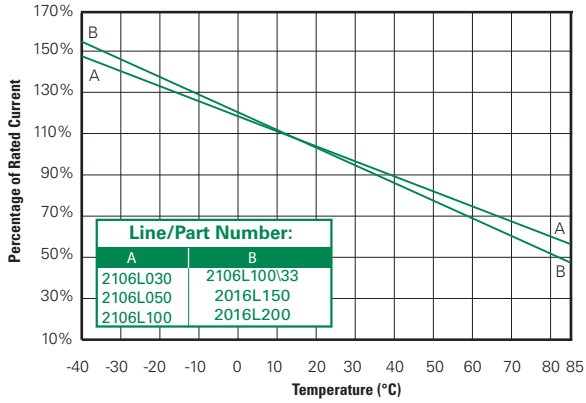
Temperature Rerating

	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)								
2016L030	0.45	0.40	0.35	0.30	0.25	0.23	0.20	0.18	0.14
2016L050	0.93	0.80	0.65	0.50	0.38	0.32	0.25	0.19	0.09
2016L075/60	1.21	1.06	0.91	0.75	0.61	0.54	0.45	0.38	0.26
2016L100	1.66	1.47	1.29	1.10	0.91	0.83	0.73	0.64	0.50
2016L100/33	1.66	1.47	1.29	1.10	0.91	0.83	0.73	0.64	0.50
2016L150	2.26	2.00	1.76	1.50	1.24	1.13	1.00	0.87	0.68
2016L200	2.80	2.50	2.19	2.00	1.84	1.74	1.50	1.34	1.14

Average Time Current Curves



Temperature Rerating Curve



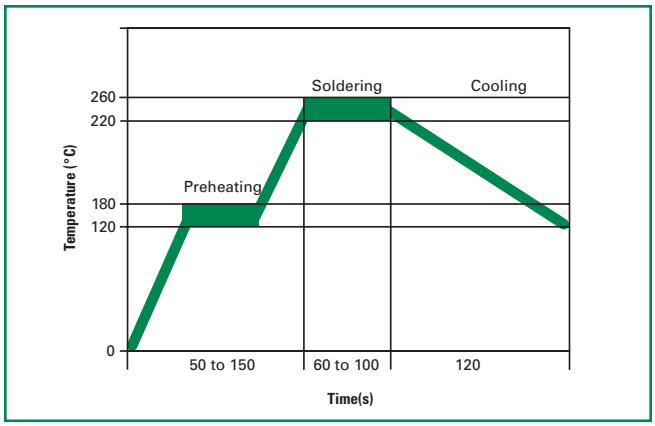
The average time current curves and Temperature Rerating curve performance is affected by a number or variables, and these curves provided as guidance only. Customer must verify the performance in their application.

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.



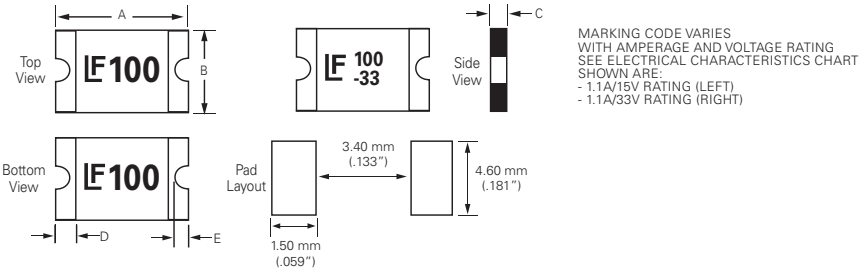
Physical Specifications

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 Sensitivity Level	Level 1, J–STD–020C

Dimensions (mm)



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
2016L030									0.03	0.05	0.75	1.25								
2016L050									0.05	0.08	1.2	2								
2016L075/60									0.05	0.08	1.2	2								
2016L100	0.19	0.21	4.72	5.44	0.15	0.17	3.7	4.43	0.02	0.03	0.5	0.75	0.01	0.06	0.3	1.5	0.01	0.03	0.25	0.65
2016L100/33									0.03	0.05	0.75	1.25								
2016L150									0.03	0.06	0.75	1.55								
2016L200									0.02	0.03	0.5	0.75								

Part Ordering Number System

2016 L xxx /xx D R HF

- **HALOGEN-FREE**
  Required for some items. See Packaging section.
- **PACKAGING STYLE**
  R: Tape & Reel
- **QUANTITY CODE: D**=1500 **M**=1000 **P**=2000
- **SPECIAL VOLTAGE RATING ITEM**
  (Not applicable to all parts. 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** (0.20 x 0.16 inch)

SERIES

Packaging

Part Number	Ordering Number	Halogen Free	I_{hold} (A)	I_{hold} Code	Voltage Option	Packaging Option	Quantity	Quantity & Packaging Codes
2016L030	2016L030DRHF	Yes	0.30	030		Tape and Reel	1500	DR
	2016L030DR	No						
2016L050	2016L050MRHF	Yes	0.55	050		Tape and Reel	1000	MR
	2016L050MR	No						
2016L075/060	2016L075/60MR	Yes	0.75	075	/60	Tape and Reel	1000	MR
2016L100	2016L100PRHF	Yes	1.10	110		Tape and Reel	2000	PR
	2016L100PR	No						
2016L100/33	2016L100/33DRHF	Yes	1.10	110	/33	Tape and Reel	1500	DR
	2016L100/33DR	No						
2016L150	2016L150DRHF	Yes	1.50	150		Tape and Reel	1500	DR
	2016L150DR	No						
2016L200	2016L200PRHF	Yes	2.00	200		Tape and Reel	2000	PR
	2016L200PR	No						

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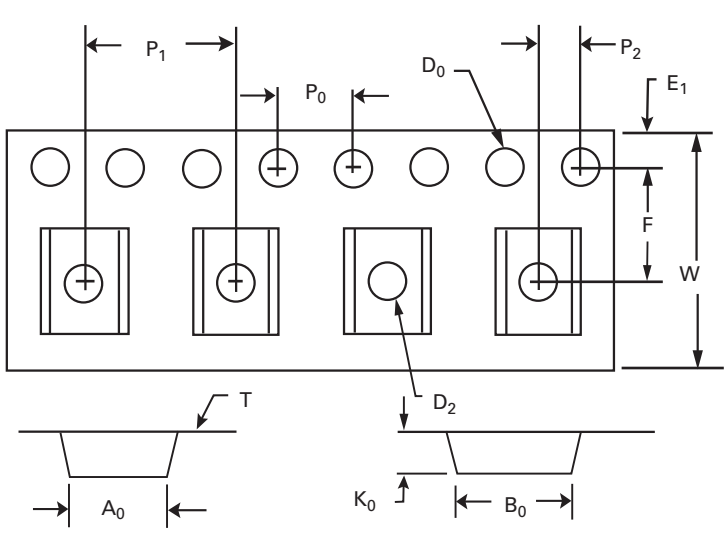
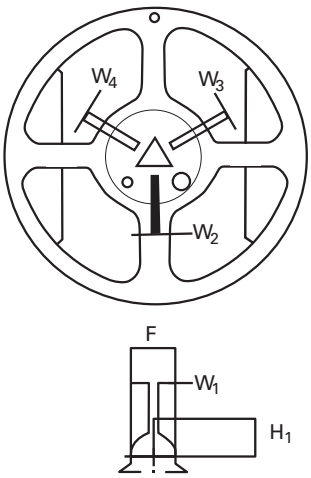
Tape and Reel Specifications

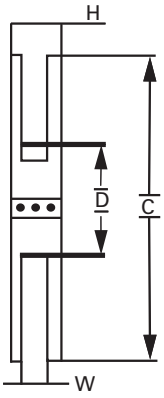
TAPE SPECIFICATIONS: EIA-481-1 (mm)			
	2016L100 2016L200	2016L030 2016L100/33 2016L150	2016L050 2016L075/60
W	12.0+/-0.30	12.0+/-0.30	12.0+/-0.30
F	5.50+/-0.05	5.50+/-0.05	5.50+/-0.05
E_1	1.75+/-0.10	1.75+/-0.10	1.75+/-0.10
D_0	1.55+/-0.05	1.55+/-0.05	1.55+/-0.05
D_1	1.50 (MIN)	1.50 (MIN)	1.50 (MIN)
P_0	4.0+/-0.10	4.0+/-0.10	4.0+/-0.10
P_1	8.0+/-0.10	8.0+/-0.10	8.0+/-0.10
P_2	2.0+/-0.05	2.0+/-0.05	2.0+/-0.05
A_0	4.40+/-0.10	4.48+/-0.10	4.45+/-0.10
B_0	5.50+/-0.10	5.40+/-0.10	5.48+/-0.10
T	0.25+/-0.10	0.25+/-0.10	0.25+/-0.10
K_o	0.80+/-0.10	1.36+/-0.10	1.86+/-0.10
Leader Min.	390	390	390
Trailer Min.	160	160	160

REEL DIMENSIONS: EIA-481-1 (mm)	
H	12.0+/-0.05
W	13.2+/-1.5
D	Ø 60+0.5
F	Ø13.0+/-0.2
C	Ø178+/-1.0
H_1	11+/-0.5
W_1	2.2+/-0.5
W_2	3.0+0.5
W_3	4.0+0.5
W_4	5.5+0.5

Tape and Reel Diagram







2016L Series

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Littelfuse:
2016L075/60MR