POLYFUSE[®] Resettable PTCs

Surface Mount > 0603L Series

RoHS MHF 0603L Series

Littelfuse

Expertise Applied | Answers Delivered

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Agency Approvals								
AGENCY	AGENCY FILE NUMBER							
c AN us	E183209							
ے تاب	R50119118							

Description

The 0603L 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
- PDAs / digital cameras
- Game console port
 protection

Electrical Characteristics

Part Number	Marking		ا _{trip}	V _{max}	l _{max}	P _d	Maximu To T	ımTime Trip	Resist	tance	Age Appro	ncy ovals
ran number	Warking	(A)	(A)	(Vdc)	(A)	(W)	Current (A)	Time (Sec.)	R _{min} (Ω)	R _{1max} (Ω)	c 🔊 us	Д тüv
0603L010	С	0.10	0.30	15	40	0.5	0.50	1.00	0.900	6.000	Х	Х
0603L020	Н	0.20	0.50	9	40	0.5	1.00	0.60	0.550	3.500	Х	х
0603L025	I	0.25	0.55	9	40	0.5	8.00	0.08	0.500	3.000	Х	Х
0603L035	F	0.35	0.75	6	40	0.5	8.00	0.10	0.200	1.000	Х	х

I hold = Hold current: maximum current device will pass without tripping in 20°C still air.

I $_{_{\rm trip}}$ = 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 _{tmax} = 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 0603L PTC products will be manufactured Halogen Free (HF). Existing Non-Halogen Free 0603L PTC products will continue to be sold until supplies are depleted. Effective January 1, 2010, all 0603L 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.

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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)											
0603L010	0.13	0.12	0.11	0.10	0.08	0.07	0.06	0.05	0.03			
0603L020	0.27	0.25	0.23	0.20	0.17	0.14	0.12	0.10	0.07			
0603L025	0.32	0.29	0.27	0.25	0.21	0.18	0.16	0.14	0.10			
0603L035	0.47	0.41	0.38	0.35	0.29	0.26	0.24	0.20	0.14			

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.





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Soldering Parameters

Profile Feature		Pb-Free Assembly		
Average Ramp-Up	3°C/second max			
	Temperature Min (T _{s(min)})	150°C		
Pre Heat:	Temperature Max (T _{s(max)})	200°C		
	Time (Min to Max) (t_s)	60 – 180 secs		
Time Maintained	Temperature (T_L)	217°C		
Above:	Temperature (t_{L})	60 – 150 seconds		
Peak / Classification	on Temperature (T _P)	260 ^{+0/-5} °C		
Time within 5°C c Temperature (t _p)	20 – 40 seconds			
Ramp-down Rate	6°C/second max			
Time 25°C to pea	k 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, N₂ 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 -/+10% typical resistance change
Humidity Aging	+85°C, 85% R.H.,100 hours -/+15% 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

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Dimensions





A		4			l	В		С			D				E					
Part Number	In	ch	m	m	In	ch	m	m	In	ch	m	m	Inc	ch	m	m	In	ch	m	m
	Min	Max																		
0603L010	.055	.071	1.40	1.80	.024	.039	0.60	1.00	.016	.030	0.40	0.75	.006	.020	0.15	0.50	.004	.016	0.10	0.40
0603L020	.055	.071	1.40	1.80	.024	.039	0.60	1.00	.016	.030	0.40	0.75	.006	.020	0.15	0.50	.004	.016	0.10	0.40
0603L025	.055	.071	1.40	1.80	.024	.039	0.60	1.00	.016	.030	0.40	0.75	.006	.020	0.15	0.50	.004	.016	0.10	0.40
0603L035	.055	.071	1.40	1.80	.024	.039	0.60	1.00	.030	.061	0.75	1.55	.006	.020	0.15	0.50	.004	.016	0.10	0.40

Part Ordering Number System



Packaging

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Part Number	Ordering Number		l _{hold} (A)	I _{hold} Code	Packaging Option	Quantity	Quantity & Packaging Codes
06021.010	0603L010YRHF	Yes	0.10	010	Tana and Daal	4000	VD
0603L010	0603L010YR	No	0.10	010	Tape and neer	4000	Ĩ
06021 020	0603L020YRHF	Yes	0.20	020	Tapo and Rool	4000	VP
00032020	0603L020YR	No	0.20	020	Tape and neer	4000	In
06021 025	0603L025YRHF	Yes	0.25	025	Tapa and Paal	4000	VD
0603L025	0603L025YR	No	0.25		Tape and neer	4000	Ĩ
0603L035	0603L035YRHF	Yes	0.25	025	Tapa and Paal	4000	VD
	0603L035YR	No	0.35	035	Tape and Reel	4000	I I I I

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Tape and Reel Specifications

TAPE SPECIFICATIONS: EIA-481-1 (mm)						
	0603L010 0603L020 0603L025	0603L035				
w	8.0+/- 0.30	8.0+/- 0.30				
F	3.5+/- 0.05	3.5+/- 0.05				
E,	1.75+/- 0.10	1.75+/- 0.10				
D	1.55+/- 0.05	1.55+/- 0.05				
D ₁	0.5(min)	0.5 (min)				
P ₀	4.0+/- 0.10	4.0+/- 0.10				
P ₁	4.0+/- 0.10	4.0+/- 0.10				
P ₂	2.0+/- 0.05	2.0+/- 0.05				
A ₀	1.10+/- 0.10	1.10+/- 0.10				
B ₀	1.92+/- 0.10	1.92+/- 0.10				
т	0.20+/- 0.10	0.20+/- 0.10				
K _o	0.72+/- 0.10	0.96+/- 0.10				
Leader min.	390	390				
Trailer min.	160	160				

REEL DIMENSIONS: EIA-481-1 (mm)							
н	12.0+/- 0.05						
w	9.0+/- 0.5						
D	Ø60+0.5						
F	Ø13.0 +/- 0.2						
С	Ø178 +/- 1.0						
H ₁	11+/- 0.5						
W ₁	2.2+/- 0.5						
\mathbf{W}_{2}	3.0+0.5						
W ₃	4.0+0.5						
\mathbf{W}_{4}	5.5+0.5						

Tape and Reel Diagram





