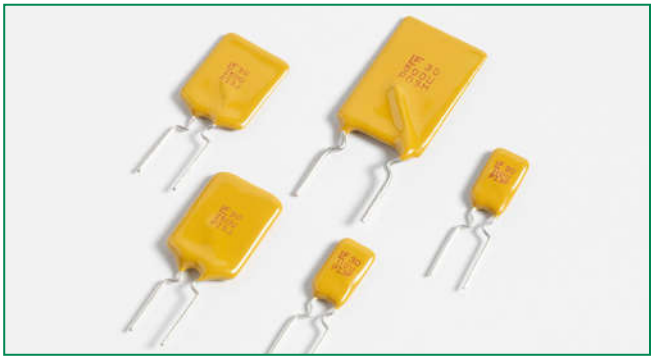
Littelfuse
Expertise Applied | Answers Delivered

POLY-FUSE® Resettable PTCs

Radial Leaded > 30R Series

30R Series



Description

The 30R Series radial leaded device is designed to provide overcurrent protection for low voltage (≤30V) applications where space is not a concern and resettable protection is preferred.

Features

- Cured, flame retardant epoxy polymer insulating material meets UL 94V-0 requirements
- Fast time–to-trip
- RoHS compliant, Lead-Free and Halogen-Free*

Applications

- USB hubs, ports and peripherals
- Computers & peripherals
- Motor protection
- General electronics
- Automotive applications

Agency Approvals

AGENCY	AGENCY FILE NUMBER
c UL us	E183209
	R50119318

Additional Information

Datasheet | Resources | Samples

Electrical Characteristics

Part Number	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	
30R090U	0.90	1.80	30	40	0.6	4.50	5.90	0.070	0.220	X	X
30R110U	1.10	2.20	30	40	0.7	5.50	6.60	0.050	0.170	X	X
30R135U	1.35	2.70	30	40	0.8	6.75	7.30	0.040	0.130	X	X
30R160U	1.60	3.20	30	40	0.9	8.00	8.00	0.030	0.110	X	X
30R185U	1.85	3.70	30	40	1.0	9.25	8.70	0.030	0.090	X	X
30R250U	2.50	5.00	30	40	1.2	12.50	10.30	0.020	0.070	X	X
30R300U	3.00	6.00	30	40	2.0	15.00	10.80	0.020	0.080	X	X
30R400U	4.00	8.00	30	40	2.5	20.00	12.70	0.010	0.050	X	X
30R500U	5.00	10.00	30	40	3.0	25.00	14.50	0.010	0.050	X	X
30R600U	6.00	12.00	30	40	3.5	30.00	16.00	0.005	0.040	X	X
30R700U	7.00	14.00	30	40	3.8	35.00	17.50	0.005	0.030	X	X
30R800U	8.00	16.00	30	40	4.0	40.00	18.80	0.005	0.020	X	X
30R900U	9.00	18.00	30	40	4.2	40.00	20.00	0.005	0.020	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_{1max} = Maximum resistance of device at 20°C measured one hour after tripping.
Caution: Operation beyond the specified rating may result in damage and possible arcing and flame.

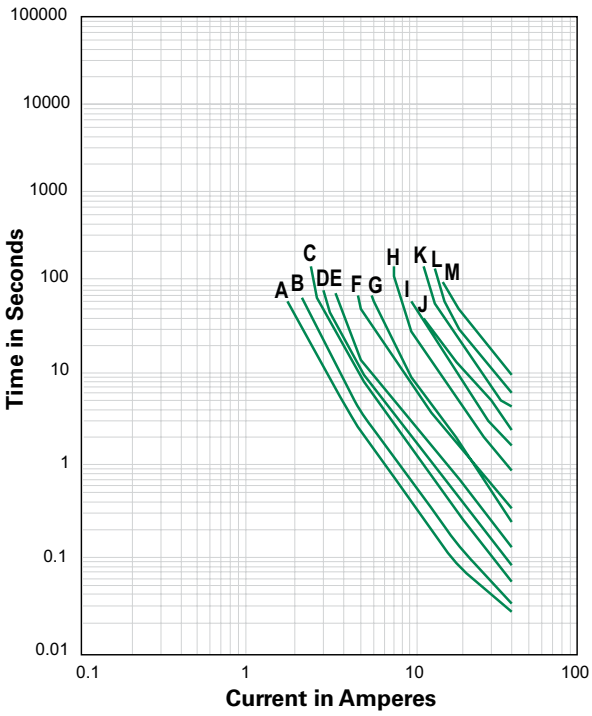
* Effective January 1, 2010, all 30R PTC products will be manufactured Halogen Free (HF). Existing Non-Halogen Free 30R PTC products may continue to be sold, until supplies are depleted.

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Temperature Rerating

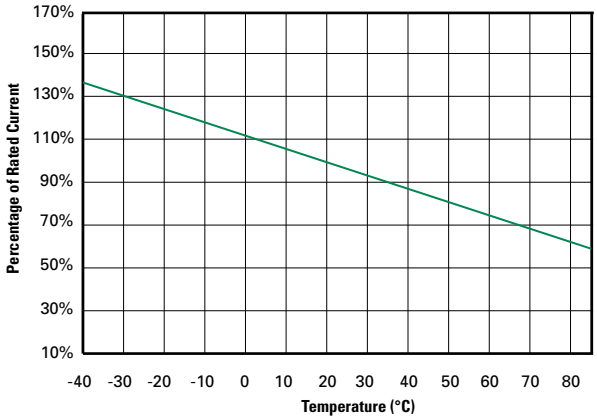
	Ambient Operation Temperature								
	-40°C	-20°C	0°C	20°C	40°C	50°C	60°C	70°C	85°C
Part Number	Hold Current (A)								
30R090U	1.31	1.17	1.04	0.90	0.75	0.69	0.61	0.55	0.47
30R110U	1.60	1.43	1.27	1.10	0.91	0.85	0.75	0.67	0.57
30R135U	1.96	1.76	1.55	1.35	1.12	1.04	0.92	0.82	0.70
30R160U	2.32	2.08	1.84	1.60	1.33	1.23	1.09	0.98	0.83
30R185U	2.68	2.41	2.13	1.85	1.54	1.42	1.26	1.13	0.96
30R250U	3.63	3.25	2.88	2.50	2.08	1.93	1.70	1.53	1.30
30R300U	4.35	3.90	3.45	3.00	2.49	2.31	2.04	1.83	1.56
30R400U	5.80	5.20	4.60	4.00	3.32	3.08	2.72	2.44	2.08
30R500U	7.25	6.50	5.75	5.00	4.15	3.85	3.40	3.05	2.60
30R600U	8.70	7.80	6.90	6.00	4.98	4.62	4.08	3.66	3.12
30R700U	10.15	9.10	8.05	7.00	5.81	5.39	4.76	4.27	3.64
30R800U	11.60	10.40	9.20	8.00	6.64	6.16	5.44	4.88	4.16
30R900U	13.05	11.70	10.35	9.00	7.47	6.93	6.12	5.49	4.68

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.

Temperature Rerating Curve



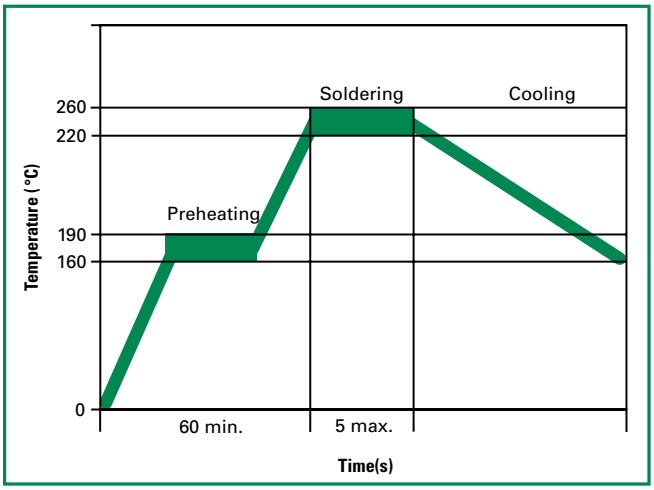
Note:
Typical Temperature rerating curve, refer to table for derating data

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Soldering Parameters - Wave Soldering

Pre-Heating Zone	Refer to the condition recommended by the flux manufacturer. Max. ramping rate should not exceed 4°C/Sec.
Soldering Zone	Max. solder temperature should not exceed 260°C Time within 5°C of actual Max. solder temperature within 3 - 5 seconds Total time from 25°C room to Max. solder temperature within 5 minutes including Pre-Heating time
Cooling Zone	Cooling by natural convection in air. Max. ramping down rate should not exceed 6°C/Sec.



Physical Specifications

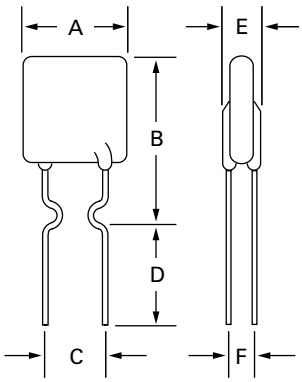
Lead Material	0.90-1.85A: Tin-plated Copper clad steel 2.50-9.00A: Tin-plated Copper
Soldering Characteristics	Solderability per MIL–STD–202, Method 208
Insulating Material	Cured, flame retardant epoxy polymer meets UL94V-0 requirements.
Device Labeling	Marked with 'LF', voltage, current rating, and date code.

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	+85°C to -40°C 10 times -/+5% typical resistance change
Solvent Resistance	MIL–STD–202, Method 215 No change
Moisture Resistance Level	Level 1, J–STD–020

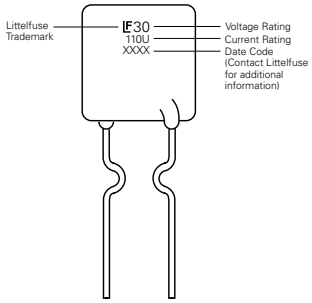
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Dimensions



Part Marking System

Single Sided Marking

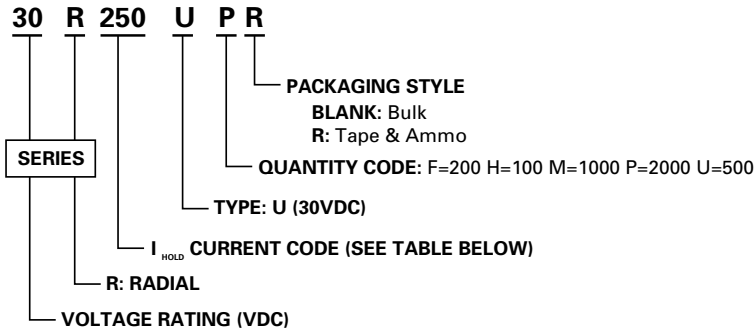


Part Number	A		B		C		D		E		F		Physical Characteristics		
	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Lead (dia)		Material
	Max.	Max.	Max.	Max.	Typ.	Typ.	Min.	Min.	Max.	Max.	Typ.	Typ.	Inches	mm	
30R090U	0.29	7.40	0.48	12.20	0.20	5.10	0.30	7.60	0.12	3.00	0.039	1.0	0.02	0.51	Sn/CuFe
30R110U	0.29	7.40	0.56	14.20	0.20	5.10	0.30	7.60	0.12	3.00	0.039	1.0	0.02	0.51	Sn/CuFe
30R135U	0.35	8.90	0.53	13.50	0.20	5.10	0.30	7.60	0.12	3.00	0.039	1.0	0.02	0.51	Sn/CuFe
30R160U	0.35	8.90	0.60	15.20	0.20	5.10	0.30	7.60	0.12	3.00	0.039	1.0	0.02	0.51	Sn/CuFe
30R185U	0.40	10.20	0.62	15.70	0.20	5.10	0.30	7.60	0.12	3.00	0.039	1.0	0.02	0.51	Sn/CuFe
30R250U	0.45	11.40	0.72	18.30	0.20	5.10	0.30	7.60	0.12	3.00	0.039	1.0	0.02	0.51	Sn/Cu
30R300U	0.45	11.40	0.76	19.20	0.20	5.10	0.30	7.60	0.12	3.00	0.047	1.2	0.03	0.81	Sn/Cu
30R400U	0.55	14.00	0.87	22.00	0.20	5.10	0.30	7.60	0.12	3.00	0.047	1.2	0.03	0.81	Sn/Cu
30R500U	0.55	14.00	1.01	25.60	0.40	10.20	0.30	7.60	0.12	3.00	0.047	1.2	0.03	0.81	Sn/Cu
30R600U	0.65	16.50	1.06	26.80	0.40	10.20	0.30	7.60	0.12	3.00	0.047	1.2	0.03	0.81	Sn/Cu
30R700U	0.75	19.10	1.13	28.60	0.40	10.20	0.30	7.60	0.12	3.00	0.047	1.2	0.03	0.81	Sn/Cu
30R800U	0.85	21.60	1.22	31.10	0.40	10.20	0.30	7.60	0.12	3.00	0.047	1.2	0.03	0.81	Sn/Cu
30R900U	0.95	24.10	1.24	31.60	0.40	10.20	0.30	7.60	0.12	3.00	0.047	1.2	0.03	0.81	Sn/Cu

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Part Ordering Number System



Packaging

Part Number	Ordering Number	I_{hold} (A)	I_{hold} Code	Packaging Option	Quantity	Quantity & Packaging Codes
30R090U	30R090UU	0.90	090	Bulk	500	U
	30R090UPR			Tape and Ammo	2000	PR
30R110U	30R110UU	1.10	110	Bulk	500	U
	30R110UPR			Tape and Ammo	2000	PR
30R135U	30R135UU	1.35	135	Bulk	500	U
	30R135UPR			Tape and Ammo	2000	PR
30R160U	30R160UU	1.60	160	Bulk	500	U
	30R160UPR			Tape and Ammo	2000	PR
30R185U	30R185UU	1.85	185	Bulk	500	U
	30R185UPR			Tape and Ammo	2000	PR
30R250U	30R250UU	2.50	250	Bulk	500	U
	30R250UPR			Tape and Ammo	2000	PR
30R300U	30R300UU	3.00	300	Bulk	500	U
	30R300UPR			Tape and Ammo	2000	PR
30R400U	30R400UF	4.00	400	Bulk	200	F
	30R400UMR			Tape and Ammo	1000	MR
30R500U	30R500UF	5.00	500	Bulk	200	F
	30R500UMR			Tape and Ammo	1000	MR
30R600U	30R600UF	6.00	600	Bulk	200	F
	30R600UMR			Tape and Ammo	1000	MR
30R700U	30R700UF	7.00	700	Bulk	200	F
	30R700UMR			Tape and Ammo	1000	MR
30R800U	30R800UH	8.00	800	Bulk	100	H
30R900U	30R900UH	9.00	900	Bulk	100	H

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Tape and Ammo Specifications

Devices taped using EIA468-B/IE286-2 standards. See table below and Figure 1 for details.

Dimension	EIA Mark	IEC Mark	Dimensions	
			Dim. (mm)	Tol. (mm)
Carrier tape width	**W**	**W**	18	-0.5 / +1.0
Hold down tape width:	**W_4**	**W_0**	11	min.
Top distance between tape edges	**W_6**	**W_2**	3	max.
Sprocket hole position	**W_5**	**W_1**	9	-0.5 / +0.75
Sprocket hole diameter*	**D_0**	**D_0**	4	-0.32 / +0.2
Abscissa to plane(straight lead)	**H**	**H**	18.5	-/+ 3.0
Abscissa to plane(kinked lead)	**H_0**	**H_0**	16	-/+ 0.5
Abscissa to top: 30R090-30R185	**H_1**	**H_1**	32.2	max.
Abscissa to top: 30R250-30R900			45.0	max.
Overall width w/o lead protrusion: 30R090-30R185	**C_1**		42.5	max.
Overall width w/o lead protrusion: 30R250-30R900			56	max.
Overall width w/ lead protrusion: 30R090-30R185	**C_2**		43.2	max.
Overall width w/ lead protrusion: 30R250-30R900			57	max.
Lead protrusion	**L_1**	**I_1**	1.0	max.
Protrusion of cut out	**L**	**L**	11	max.
Protrusion beyond hold–down tape	**I_2**	**I_2**	Not specified	
Sprocket hole pitch: 30R090-30R300	**P_0**	**P_0**	12.7	-/+ 0.3
Sprocket hole pitch on: 30R400-30R900	**P_0**	**P_0**	25.4	-/+ 0.5
Device pitch: 30R090-30R300			12.7	
Device pitch: 30R400-30R900			25.4	
Pitch tolerance			20 consecutive.	-/+ 1
Tape thickness	**t**	**t**	0.9	max.
Tape thickness with splice: 30R090-30R250	**t_1**		1.5	max.
Tape thickness with splice: 30R300-30R900	**t_1**		2.0	max.
Splice sprocket hole alignment			0	-/+ 0.3
Body lateral deviation	**Δh**	**Δh**	0	-/+ 1.0
Body tape plane deviation	**Δp**	**Δp**	0	-/+ 1.3
Ordinate to adjacent component lead*	**P_1**	**P_1**	3.81	-/+ 0.7
Ordinate to adjacent component lead*			7.62	-/+ 0.7
Lead spacing: 30R090–30R400	**F**	**F**	5.08	-/+ 0.8
Lead spacing: 30R500-30R900	**F**	**F**	10.18	-/+ 0.8

*Differs from EIA Specification

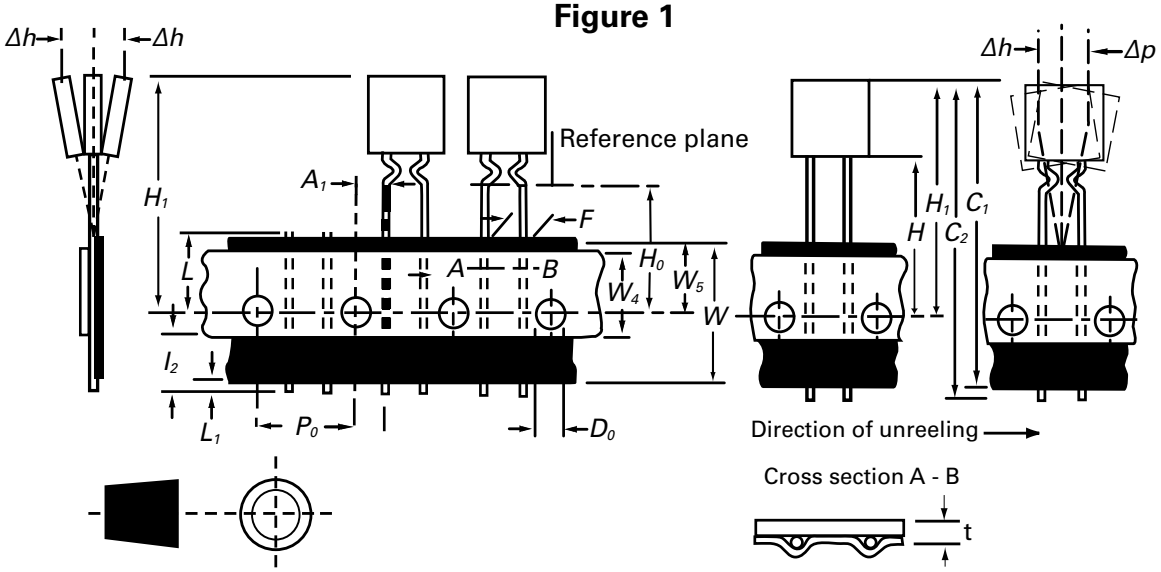
WARNING

- 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.

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Tape and Ammo Diagram

Figure 1



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