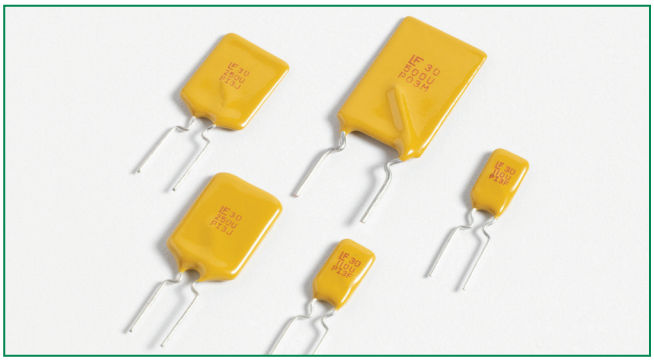
RoHS Pb HF 30R Series



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*

Agency Approvals

AGENCY	AGENCY FILE NUMBER
c UL us	E183209
TÜV	R50119318

Applications

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

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	TÜV
30R090	0.90	1.80	30	40	0.6	4.50	5.90	0.070	0.220	X	X
30R110	1.10	2.20	30	40	0.7	5.50	6.60	0.050	0.170	X	X
30R135	1.35	2.70	30	40	0.8	6.75	7.30	0.040	0.130	X	X
30R160	1.60	3.20	30	40	0.9	8.00	8.00	0.030	0.110	X	X
30R185	1.85	3.70	30	40	1.0	9.25	8.70	0.030	0.090	X	X
30R250	2.50	5.00	30	40	1.2	12.50	10.30	0.020	0.070	X	X
30R300	3.00	6.00	30	40	2.0	15.00	10.80	0.020	0.080	X	X
30R400	4.00	8.00	30	40	2.5	20.00	12.70	0.010	0.050	X	X
30R500	5.00	10.00	30	40	3.0	25.00	14.50	0.010	0.050	X	X
30R600	6.00	12.00	30	40	3.5	30.00	16.00	0.005	0.040	X	X
30R700	7.00	14.00	30	40	3.8	35.00	17.50	0.005	0.030	X	X
30R800	8.00	16.00	30	40	4.0	40.00	18.80	0.005	0.020	X	X
30R900	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 23°C still air.
I_{trip} = Trip current: minimum current at which the device will trip in 23°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 23°C still air.
R_{min} = Minimum resistance of device in initial (un-soldered) state.
R_{1max} = Maximum resistance of device at 23°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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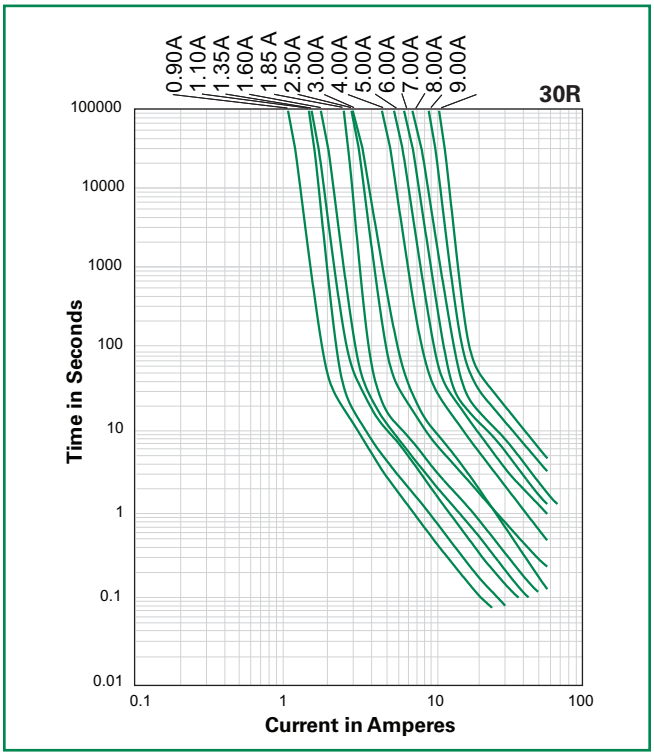
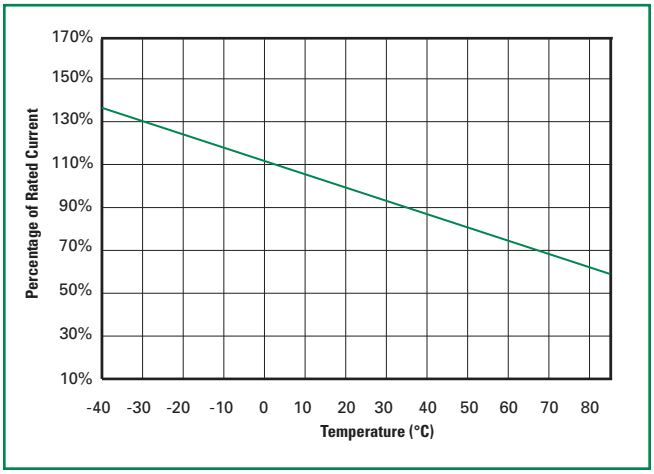
Temperature Rerating

	Ambient Operation Temperature								
	-40°C	-20°C	0°C	23°C	40°C	50°C	60°C	70°C	85°C
Part Number	Hold Current (A)								
30R090	1.31	1.17	1.04	0.90	0.75	0.69	0.61	0.55	0.47
30R110	1.60	1.43	1.27	1.10	0.91	0.85	0.75	0.67	0.57
30R135	1.96	1.76	1.55	1.35	1.12	1.04	0.92	0.82	0.70
30R160	2.32	2.08	1.84	1.60	1.33	1.23	1.09	0.98	0.83
30R185	2.68	2.41	2.13	1.85	1.54	1.42	1.26	1.13	0.96
30R250	3.63	3.25	2.88	2.50	2.08	1.93	1.70	1.53	1.30
30R300	4.35	3.90	3.45	3.00	2.49	2.31	2.04	1.83	1.56
30R400	5.80	5.20	4.60	4.00	3.32	3.08	2.72	2.44	2.08
30R500	7.25	6.50	5.75	5.00	4.15	3.85	3.40	3.05	2.60
30R600	8.70	7.80	6.90	6.00	4.98	4.62	4.08	3.66	3.12
30R700	10.15	9.10	8.05	7.00	5.81	5.39	4.76	4.27	3.64
30R800	11.60	10.40	9.20	8.00	6.64	6.16	5.44	4.88	4.16
30R900	13.05	11.70	10.35	9.00	7.47	6.93	6.12	5.49	4.68

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.

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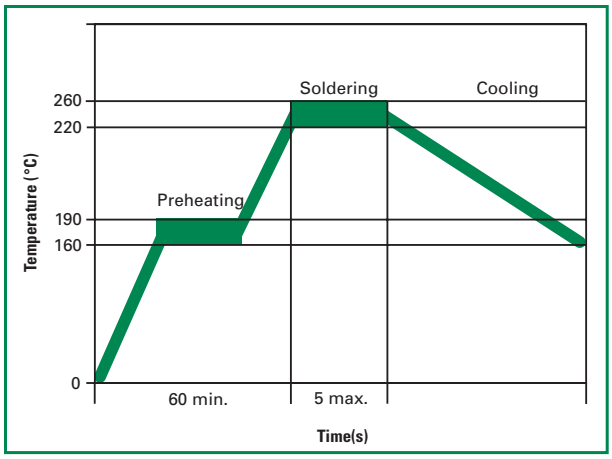
Soldering Parameters - Wave Soldering

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
Cooling Zone	Cooling by natural convection in air.



Physical Specifications

Lead Material	0.90-2.50A: Tin-plated Copper clad steel 3.00-9.00A: Tin-plated Copper
Soldering Characteristics	Solderability per MIL–STD–202, Method 208E
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 215F No change
Moisture Resistance Level	Level 1, J–STD–020C

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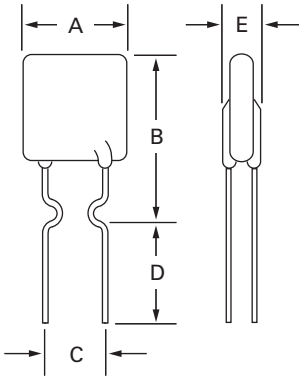
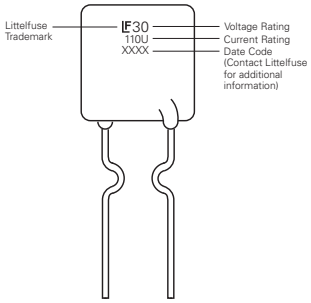
Dimensions



Part Marking System

Single Sided Marking



Part Number	A		B		C		D		E		Physical Characteristics		
	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Lead (dia)		Material
	Max.	Max.	Max.	Max.	Typ.	Typ.	Min.	Min.	Max.	Max.	Inches	mm	
30R090	0.29	7.40	0.48	12.20	0.20	5.10	0.30	7.60	0.12	3.00	0.02	0.51	Sn/CuFe
30R110	0.29	7.40	0.56	14.20	0.20	5.10	0.30	7.60	0.12	3.00	0.02	0.51	Sn/CuFe
30R135	0.35	8.90	0.53	13.50	0.20	5.10	0.30	7.60	0.12	3.00	0.02	0.51	Sn/CuFe
30R160	0.35	8.90	0.60	15.20	0.20	5.10	0.30	7.60	0.12	3.00	0.02	0.51	Sn/CuFe
30R185	0.40	10.20	0.62	15.70	0.20	5.10	0.30	7.60	0.12	3.00	0.02	0.51	Sn/CuFe
30R250	0.45	11.40	0.72	18.30	0.20	5.10	0.30	7.60	0.12	3.00	0.02	0.51	Sn/Cu
30R300	0.45	11.40	0.76	19.20	0.20	5.10	0.30	7.60	0.12	3.00	0.03	0.81	Sn/Cu
30R400	0.55	14.00	0.87	22.00	0.20	5.10	0.30	7.60	0.12	3.00	0.03	0.81	Sn/Cu
30R500	0.55	14.00	1.01	25.60	0.40	10.20	0.30	7.60	0.12	3.00	0.03	0.81	Sn/Cu
30R600	0.65	16.50	1.06	26.80	0.40	10.20	0.30	7.60	0.12	3.00	0.03	0.81	Sn/Cu
30R700	0.75	19.10	1.13	28.60	0.40	10.20	0.30	7.60	0.12	3.00	0.03	0.81	Sn/Cu
30R800	0.85	21.60	1.22	31.10	0.40	10.20	0.30	7.60	0.12	3.00	0.03	0.81	Sn/Cu
30R900	0.95	24.10	1.24	31.60	0.40	10.20	0.30	7.60	0.12	3.00	0.03	0.81	Sn/Cu

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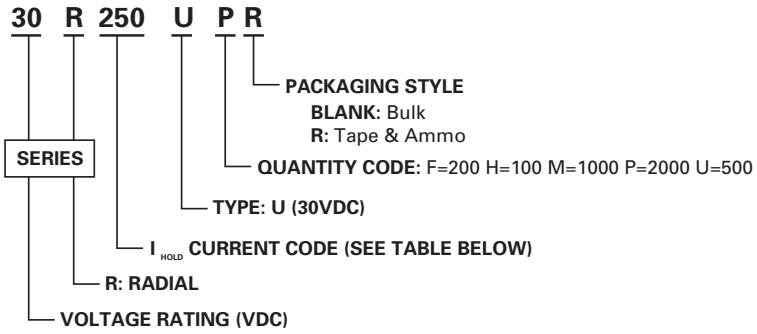
Part Ordering Number System



Packaging

Part Number	Ordering Number	I_{hold} (A)	I_{hold} Code	Packaging Option	Quantity	Quantity & Packaging Codes
30R090	30R090UU	0.90	090	Bulk	500	U
	30R090UPR			Tape and Ammo	2000	PR
30R110	30R110UU	1.10	110	Bulk	500	U
	30R110UPR			Tape and Ammo	2000	PR
30R135	30R135UU	1.35	135	Bulk	500	U
	30R135UPR			Tape and Ammo	2000	PR
30R160	30R160UU	1.60	160	Bulk	500	U
	30R160UPR			Tape and Ammo	2000	PR
30R185	30R185UU	1.85	185	Bulk	500	U
	30R185UPR			Tape and Ammo	2000	PR
30R250	30R250UU	2.50	250	Bulk	500	U
	30R250UPR			Tape and Ammo	2000	PR
30R300	30R300UU	3.00	300	Bulk	500	U
	30R300UPR			Tape and Ammo	2000	PR
30R400	30R400UF	4.00	400	Bulk	200	F
	30R400UMR			Tape and Ammo	1000	MR
30R500	30R500UF	5.00	500	Bulk	200	F
	30R500UMR			Tape and Ammo	1000	MR
30R600	30R600UF	6.00	600	Bulk	200	F
	30R600UMR			Tape and Ammo	1000	MR
30R700	30R700UF	7.00	700	Bulk	200	F
	30R700UMR			Tape and Ammo	1000	MR
30R800	30R800UH	8.00	800	Bulk	100	H
30R900	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

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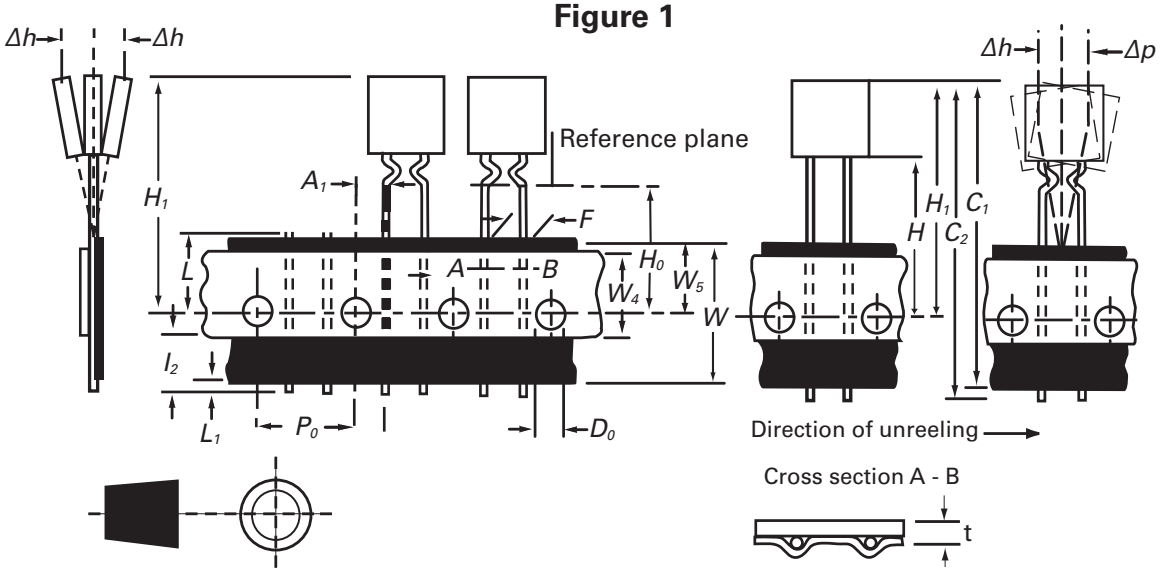
Tape and Ammo Diagram

Figure 1



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