72R Series
Radial Leaded

Description

The 72R Series is designed to provide overcurrent protection to 72Vdc maximum voltage with a maximum 40A short circuit rating.

Features & Benefits

- 72Vdc max voltage w/max 40A short circuit rating
- RoHS-compliant, Lead-Free and Halogen Free*
- Resettable feature
- Ideal for a broad range of general electronics using a low voltage power supply

Applications

- Load protection on wide range of low voltage power supplies
- Computers
- Computer peripherals
- General electronics

Additional Information

Resources | Accessories | Samples

Agency Approvals

Agency	Agency File Number
	E74889
	R72161785
	80226728

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)			
72R020X	0.20	0.40	72	40	0.41	1.00	2.20	1.830	4.400	X	X	X
72R030X	0.30	0.60	72	40	0.49	1.50	3.00	0.880	2.100	X	X	X
72R040X	0.40	0.80	72	40	0.56	2.00	3.80	0.550	1.290	X	X	X
72R050X	0.50	1.00	72	40	0.77	2.50	4.00	0.500	1.170	X	X	X
72R065X	0.65	1.30	72	40	0.88	3.25	5.30	0.310	0.720	X	X	X
72R075X	0.75	1.50	72	40	0.92	3.75	6.30	0.250	0.600	X	X	X
72R090X	0.90	1.80	72	40	0.99	4.50	7.20	0.200	0.470	X	X	X
72R110X	1.10	2.20	72	40	1.50	5.50	8.20	0.150	0.380	X	X	X
72R135X	1.35	2.70	72	40	1.70	6.75	9.60	0.120	0.300	X	X	X
72R160X	1.60	3.20	72	40	1.90	8.00	11.40	0.090	0.220	X	X	X
72R185X	1.85	3.70	72	40	2.10	9.25	12.60	0.080	0.190	X	X	X
72R250X	2.50	5.00	72	40	2.50	12.50	15.60	0.050	0.130	X	X	X
72R375X	3.75	7.50	72	40	3.20	18.75	24.00	0.030	0.080	X	X	X

Caution: Operation beyond the specified rating may result in damage and possible arcing and flame.
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_{int} = Maximum voltage the device can withstand without damage at rated current (I max)
V_{op} = The device regular operation voltage
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.

* Effective February 11, 2010 onward, all 600R PTC products will be manufactured Halogen Free (HF). Existing Non-Halogen Free 600R PTC products may continue to be sold, until supplies are depleted. This change will have no effect on 600R product specifications or performance.

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.

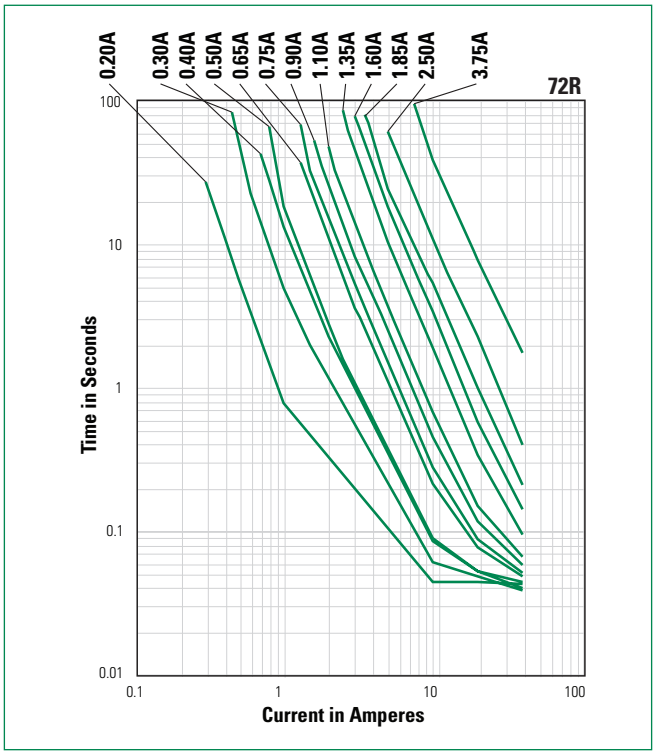
Revised: VL 07/30/25

72R Series
Radial Leaded

Temperature Rerating

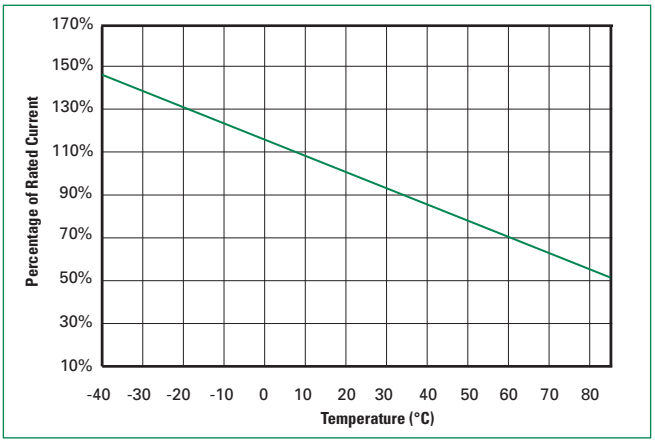
	Ambient Operation Temperature								
	-40°C	-20°C	0°C	20°C	40°C	50°C	60°C	70°C	85°C
Part Number	**Hold Current (A)**								
72R020X	0.31	0.27	0.24	0.20	0.16	0.14	0.13	0.11	0.08
72R030X	0.47	0.41	0.36	0.30	0.24	0.22	0.19	0.16	0.12
72R040X	0.62	0.54	0.48	0.40	0.32	0.29	0.25	0.22	0.16
72R050X	0.78	0.68	0.60	0.50	0.41	0.36	0.32	0.27	0.20
72R065X	1.01	0.88	0.77	0.65	0.53	0.47	0.41	0.35	0.26
72R075X	1.16	1.02	0.89	0.75	0.61	0.54	0.47	0.41	0.30
72R090X	1.40	1.22	1.07	0.90	0.73	0.65	0.57	0.49	0.36
72R110X	1.71	1.50	1.31	1.10	0.89	0.79	0.69	0.59	0.44
72R135X	2.09	1.84	1.61	1.35	1.09	0.97	0.85	0.73	0.54
72R160X	2.48	2.18	1.90	1.60	1.30	1.15	1.01	0.86	0.64
72R185X	2.87	2.52	2.20	1.85	1.50	1.33	1.17	1.00	0.74
72R250X	3.88	3.40	2.98	2.50	2.03	1.80	1.58	1.35	1.00
72R375X	5.81	5.10	4.46	3.75	3.04	2.70	2.36	2.03	1.50

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



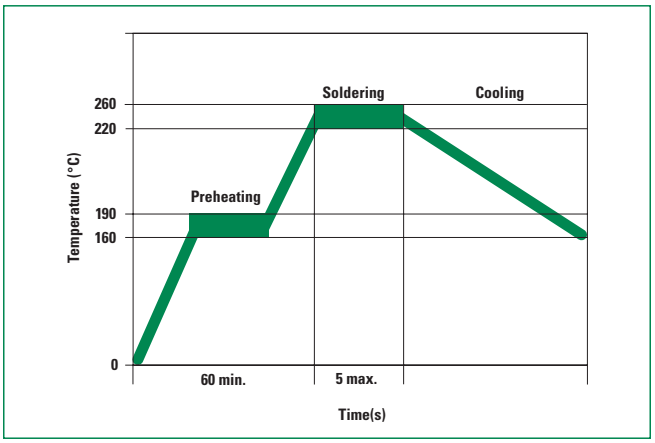
Note: Typical Temperature rerating curve, refer to table for derating data

Revised: VL 07/30/25

72R Series
Radial Leaded

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	0.20-0.40A: Tin-plated Copper clad steel 0.50-3.75A: Tin-plated Copper
Soldering Characteristics	Solderability per MIL–STD–202, Method 208
Insulating Material	Cured, flame retardant epoxy polymer meets UL 94V-0 requirements.
Lead Solderability	Marked with 'LF', voltage, current rating, and date code.

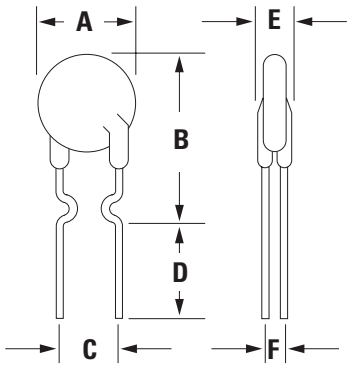
Environmental Specifications

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
Moistrue Sesitivity Level	Level 1, J–STD–020

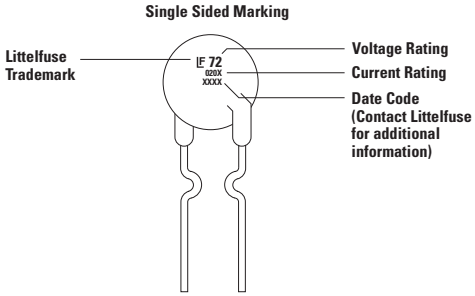
Revised: VL 07/30/25

72R Series
Radial Leaded

Dimensions



Part Marking System



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	
72R020X	0.29	7.4	0.46	11.7	0.20	5.1	0.30	7.6	0.12	3.1	0.047	1.2	0.02	0.51	Sn/CuFe
72R030X	0.29	7.4	0.50	12.7	0.20	5.1	0.30	7.6	0.12	3.1	0.047	1.2	0.02	0.51	Sn/CuFe
72R040X	0.30	7.6	0.53	13.5	0.20	5.1	0.30	7.6	0.12	3.1	0.047	1.2	0.02	0.51	Sn/CuFe
72R050X	0.31	7.9	0.54	13.7	0.20	5.1	0.30	7.6	0.12	3.1	0.047	1.2	0.02	0.51	Sn/Cu
72R065X	0.37	9.4	0.57	14.5	0.20	5.1	0.30	7.6	0.12	3.1	0.047	1.2	0.02	0.51	Sn/Cu
72R075X	0.40	10.2	0.60	15.2	0.20	5.1	0.30	7.6	0.12	3.1	0.047	1.2	0.02	0.51	Sn/Cu
72R090X	0.44	11.2	0.62	15.8	0.20	5.1	0.30	7.6	0.12	3.1	0.047	1.2	0.02	0.51	Sn/Cu
72R110X	0.51	13.0	0.72	18.2	0.20	5.1	0.30	7.6	0.12	3.1	0.055	1.4	0.03	0.81	Sn/Cu
72R135X	0.53	13.58	0.78	19.8	0.20	5.1	0.30	7.6	0.12	3.1	0.055	1.4	0.03	0.81	Sn/Cu
72R160X	0.60	15.36	0.85	21.6	0.20	5.1	0.30	7.6	0.12	3.1	0.055	1.4	0.03	0.81	Sn/Cu
72R185X	0.66	16.76	0.91	23.0	0.20	5.1	0.30	7.6	0.12	3.1	0.055	1.4	0.03	0.81	Sn/Cu
72R250X	0.78	19.93	1.03	26.2	0.40	10.2	0.30	7.6	0.12	3.1	0.055	1.4	0.03	0.81	Sn/Cu
72R375X	1.04	26.3	1.22	31.1	0.40	10.2	0.30	7.6	0.12	3.1	0.055	1.4	0.03	0.81	Sn/Cu

Part Ordering Number System

72 R 090 X P R

- **Packaging Style**
  - **Blank:** Bulk
  - **R:** Tape & Ammo
- **Quantity Code:** F=200 H=100 M=1000 P=2000 U=500
- **Type: X (72VDC)**
- **I_{HOLD} Current Code** (Refer to Packaging or Electrical Characteristics tables)
- **R: Radial**
- **Series**
- **Voltage Rating (Vdc)**

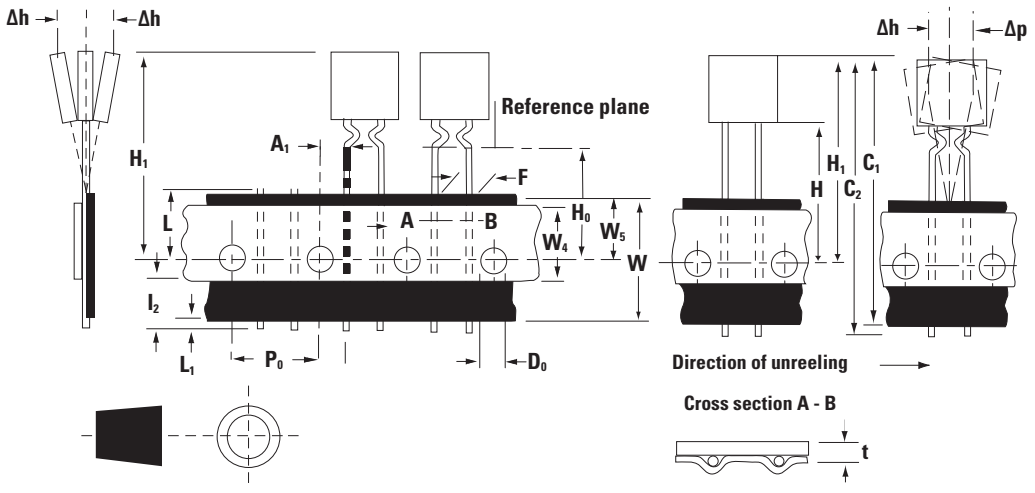
Revised: VL 07/30/25

72R Series
Radial Leaded

Packaging

Part Number	Ordering Part Number	I_{hold} (A)	I_{hold} Code	Packaging Option	Quantity	Quantity & Packaging Codes
72R020X	72R020XPR	0.20	020	Tape and Ammo	2000	PR
72R030X	72R030XPR	0.30	030	Tape and Ammo	2000	PR
72R040X	72R040XPR	0.40	040	Tape and Ammo	2000	PR
72R050X	72R050XPR	0.50	050	Tape and Ammo	2000	PR
72R065X	72R065XPR	0.65	065	Tape and Ammo	2000	PR
72R075X	72R075XPR	0.75	075	Tape and Ammo	2000	PR
72R090X	72R090XPR	0.90	090	Tape and Ammo	2000	PR
72R110X	72R110XU	1.10	110	Bulk	500	U
	72R110XMR			Tape and Ammo	1000	MR
72R135X	72R135XF	1.35	135	Bulk	200	F
	72R135XMR			Tape and Ammo	1000	MR
72R160X	72R160XF	1.60	160	Bulk	200	F
	72R160XMR			Tape and Ammo	1000	MR
72R185X	72R185XMR	1.85	185	Tape and Ammo	1000	MR
72R250X	72R250XF	2.50	250	Bulk	200	F
	72R250XMR			Tape and Ammo	1000	MR
72R375X	72R375XH	3.75	375	Bulk	100	H

Tape and Ammo Diagram
Figure 1



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Revised: VL 07/30/25

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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 72R020X–72R090X	**H_1**	**H_1**	32.2	max.
Abscissa to top 72R110X–72R250X	**H_1**	-	47.5	max.
Overall width without lead protrusion: 72R020X–72R090X	**C_1**	-	42.5	max.
Overall width without lead protrusion: 72R110X– 72R250X	-	-	57	-
Overall width with lead protrusion: 72R020X–72R090X	**C_2**	-	43.2	max.
Overall width with lead protrusion: 72R110X–72R250X	-	**58**	-	-
Lead protrusion	**L_1**	**l_1**	1.0	max.
Protrusion of cut out	**L**	**L**	11	max.
Protrusion beyond hold–down tape	**l_2**	**l_2**	Not specified	-
Sprocket hole pitch: 72R020X–72R090X	**P_0**	**P_0**	12.7	–/+ 0.3
Sprocket hole pitch: 72R110X–72R250X	**P_0**	**P_0**	25.4	–/+ 0.5
Pitch tolerance	-	-	20 consecutive.	–/+ 1
Device pitch: 72R020X–72R090X	-	-	12.7	-
Device pitch: 72R110X–72R250X	-	-	25.4	-
Tape thickness	**t**	**t**	0.9	max.
Tape thickness with splice	**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*: 72R020X–72R090X	**P_1**	**P_1**	3.81	–/+ 0.7
Ordinate to adjacent component lead*: 72R110X–72R250X	-	-	7.62	–/+ 0.7
Lead spacing: 72R020X–72R185X	**F**	**F**	5.08	–/+ 0.8
Lead spacing: 72R250X–72R250X	**F**	**F**	10.18	–/+ 0.8

*Differs from EIA Specification

Revised: VL 07/30/25