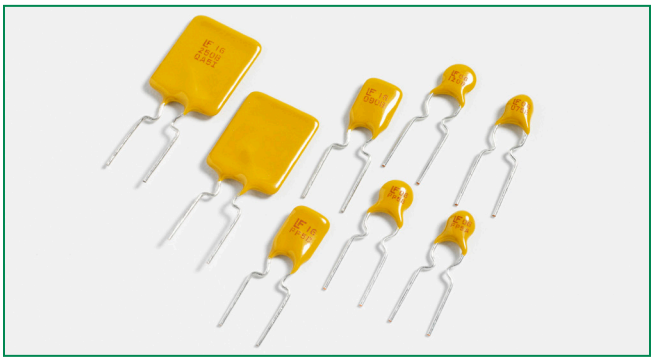
POLY-FUSE® Resettable PTCs

Radial Leaded > USBR Series

USBR Series



Description

- The USBR Series radial leaded device is designed to provide overcurrent protection for USB applications where space is not a concern.

Features

- RoHS compliant and lead–free
- Fast time–to–trip
- Meets all USB protection requirements
- 40A short circuit rating
- Operating voltages of 6-16V

Applications

- Computers & peripherals
- Any USB application

Agency Approvals

AGENCY	AGENCY FILE NUMBER
c UL us	E183209
TÜV	R50119318

Electrical Characteristics

Part Number	I_{hold} (A)	I_{trip} (A)	V_{max} (Vdc)	I_{max} (A)	P_d max. (W)	Maximum Time To Trip		Resistance		Agency Approvals	
						Current (A)	Time (Sec.)	R_{min} (Ω)	R_{1max} (Ω)	c UL us	TÜV
06R075B	0.75	1.30	6	40	0.3	8.00	0.4	0.100	0.230	X	X
06R120B	1.20	2.00	6	40	0.6	8.00	0.5	0.065	0.140	X	X
06R155B	1.55	2.70	6	40	0.6	7.75	2.2	0.040	0.100	X	X
16R090B	0.90	1.80	16	40	0.6	8.00	1.2	0.070	0.180	X	X
16R110B	1.10	2.20	16	40	0.7	8.00	2.3	0.050	0.140	X	X
16R135B	1.35	2.70	16	40	0.8	8.00	4.5	0.040	0.120	X	X
16R160B	1.60	3.20	16	40	0.9	8.00	9.0	0.030	0.110	X	X
16R185B	1.85	3.70	16	40	1.0	8.00	10.0	0.030	0.090	X	X
16R250B	2.50	5.00	16	40	1.2	8.00	40.0	0.020	0.060	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.

WARNING

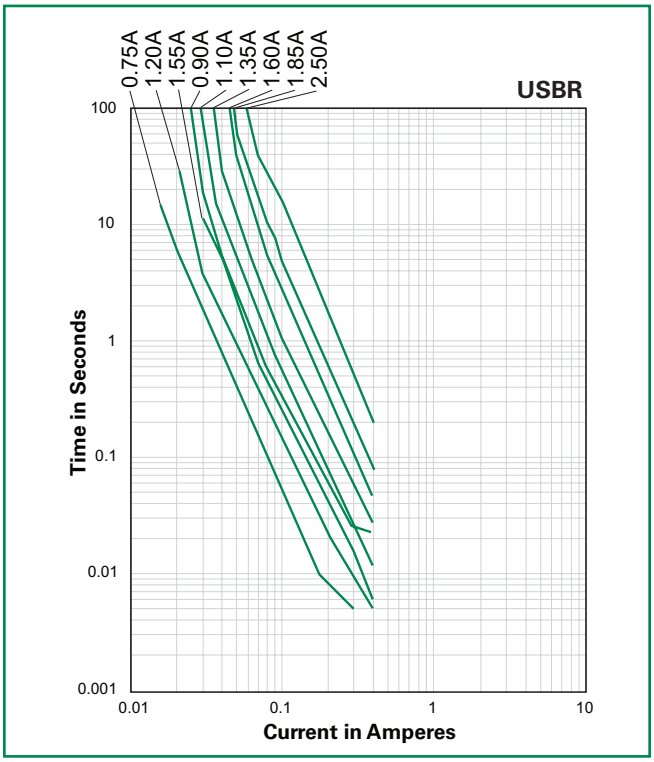
- Users shall independently assess the suitability of these devices for each of their applications
- Operation of these devices beyond the stated maximum ratings could result in damage to the devices and lead to electrical arcing and/or fire
- These devices are intended to protect against the effects 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: 01/29/15

Temperature Rerating

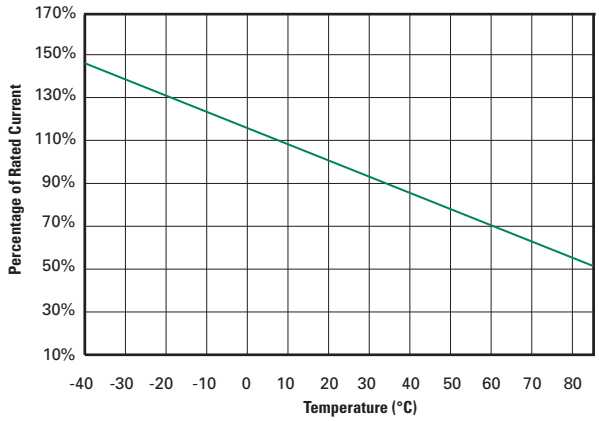
	Ambient Operation Temperature								
	-40°C	-20°C	0°C	20°C	40°C	50°C	60°C	70°C	85°C
Part Number	Hold Current (A)								
06R075B	1.05	0.95	0.85	0.75	0.65	0.60	0.55	0.50	0.43
06R120B	1.69	1.52	1.36	1.20	1.04	0.96	0.88	0.80	0.68
06R155B	2.17	1.96	1.75	1.55	1.34	1.24	1.13	1.03	0.88
16R090B	1.31	1.17	1.04	0.90	0.75	0.69	0.61	0.55	0.47
16R110B	1.60	1.43	1.27	1.10	1.00	0.92	0.75	0.67	0.57
16R135B	1.96	1.76	1.55	1.35	1.12	1.04	0.92	0.82	0.70
16R160B	2.32	2.08	1.84	1.60	1.33	1.23	1.09	0.98	0.83
16R185B	2.68	2.41	2.13	1.85	1.54	1.42	1.26	1.13	0.96
16R250B	3.63	3.25	2.88	2.50	2.08	1.93	1.70	1.53	1.30

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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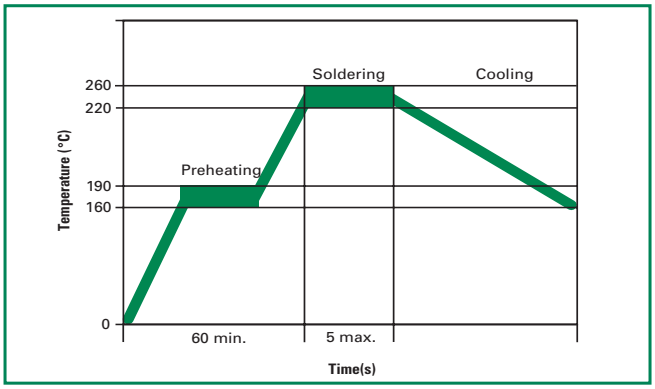
Soldering Parameters



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	.90-2.50A: Tin-plated Copper clad steel .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.
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
Moisture Sensivitivy Level	Level 1, J–STD–020

Dimensions (mm)

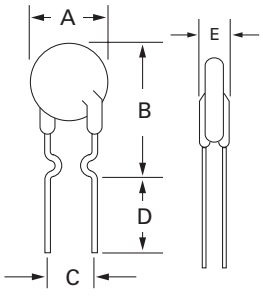


Figure 1

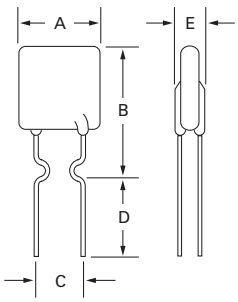
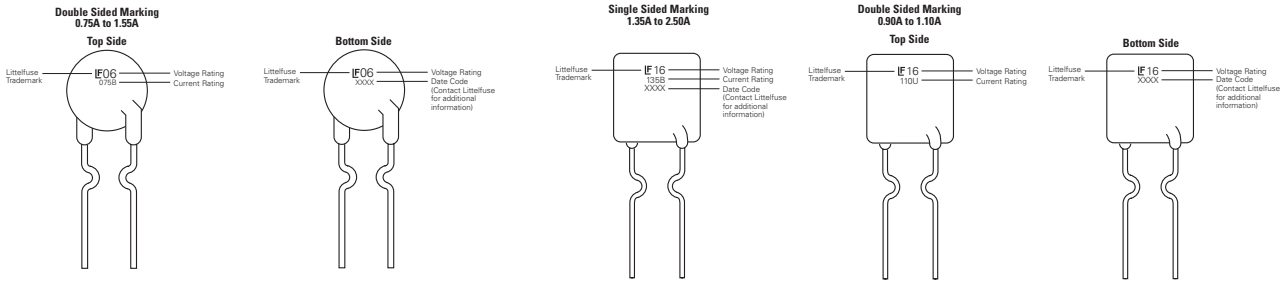


Figure 2

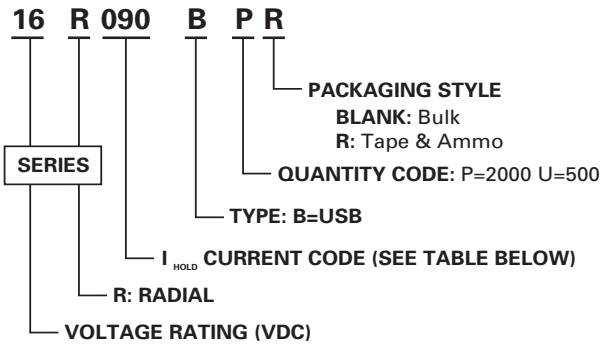
Part Number	Figure	A		B		C		D		E		Physical Characteristics		
		Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Lead (dia)		Material
		Max.	Max.	Max.	Max.	Typ.	Typ.	Min.	Min.	Max.	Max.	Inches	mm	
06R075B	1	0.27	6.9	0.45	11.4	0.20	5.1	0.30	7.6	0.12	3	0.020	0.51	Sn/Cu
06R120B	1	0.27	6.9	0.46	11.7	0.20	5.1	0.30	7.6	0.12	3	0.020	0.51	Sn/CuFe
06R155B	1	0.27	6.9	0.46	11.7	0.20	5.1	0.30	7.6	0.12	3	0.020	0.51	Sn/CuFe
16R090B	2	0.29	7.4	0.48	12.2	0.20	5.1	0.30	7.6	0.12	3	0.020	0.51	Sn/CuFe
16R110B	2	0.29	7.4	0.56	14.2	0.20	5.1	0.30	7.6	0.12	3	0.020	0.51	Sn/CuFe
16R135B	2	0.35	8.9	0.53	13.5	0.20	5.1	0.30	7.6	0.12	3	0.020	0.51	Sn/CuFe
16R160B	2	0.35	8.9	0.60	15.2	0.20	5.1	0.30	7.6	0.12	3	0.020	0.51	Sn/CuFe
16R185B	2	0.40	10.2	0.62	15.7	0.20	5.1	0.30	7.6	0.12	3	0.020	0.51	Sn/CuFe
16R250B	2	0.45	11.4	0.72	18.3	0.20	5.1	0.30	7.6	0.12	3	0.020	0.51	Sn/CuFe

Revised: 01/29/15

Part Marking System



Part Ordering Number System



Ordering Information

Part Number	Ordering Number	I_{hold} (A)	I_{hold} Code	Packaging Option	Quantity	Quantity & Packaging Codes
06R075B	06R075BU	0.75	075	Bulk	500	U
	06R075BPR			Tape and Ammo	2000	PR
06R120B	06R120BU	1.20	120	Bulk	500	U
	06R120BPR			Tape and Ammo	2000	PR
06R155B	06R155BU	1.55	155	Bulk	500	U
	06R155BPR			Tape and Ammo	2000	PR
16R090B	16R090BU	0.90	090	Bulk	500	U
	16R090BPR			Tape and Ammo	2000	PR
16R110B	16R110BU	1.10	110	Bulk	500	U
	16R110BPR			Tape and Ammo	2000	PR
16R135B	16R135BU	1.35	135	Bulk	500	U
	16R135BPR			Tape and Ammo	2000	PR
16R160B	16R160BU	1.60	160	Bulk	500	U
	16R160BPR			Tape and Ammo	2000	PR
16R185B	16R185BU	1.85	185	Bulk	500	U
	16R185BPR			Tape and Ammo	2000	PR
16R250B	16R250BU	2.50	250	Bulk	500	U
	16R250BPR			Tape and Ammo	2000	PR

Revised: 01/29/15

Tape and Ammo Specifications

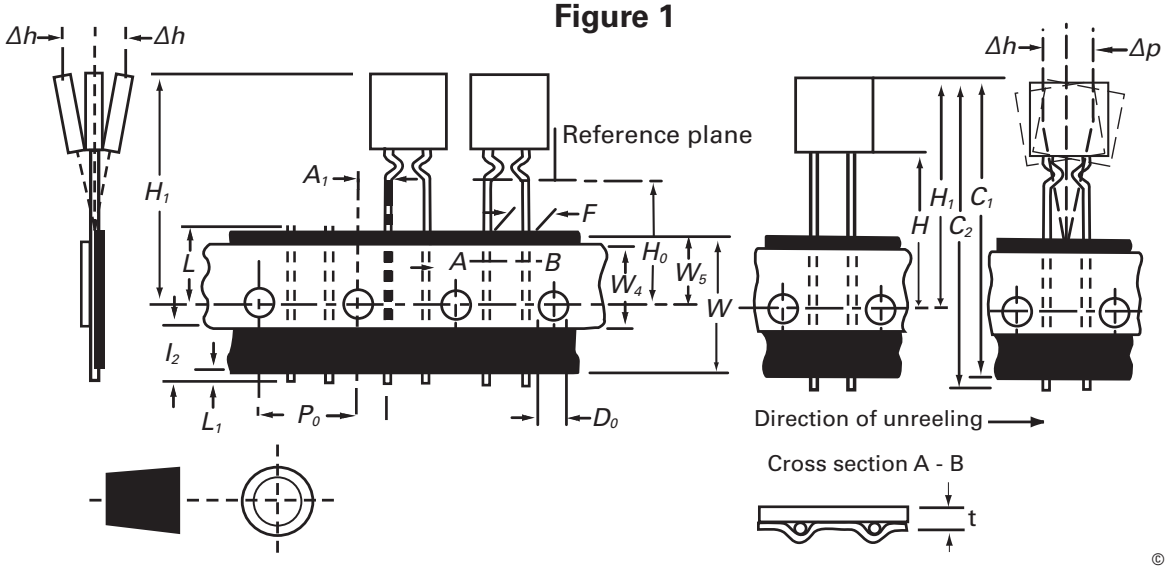
Devices taped using EIA468-B/IE286-2 standards. See table below and Figure 1 for details.

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
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	**H_1**	**H_1**	32.2	max.
Overall width w/o lead protrusion	**C_1**		42.5	max.
Overall width w/ lead protrusion	**C_2**		43.2	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	**P_0**	**P_0**	12.7	-/+ 0.35
Pitch tolerance			20 consecutive	-/+ 1
Device pitch			12.7	
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*	**P_1**	**P_1**	3.81	-/+ 1.0
Lead spacing*	**F**	**F**	5.08	-/+ 0.8

*Differs from EIA specification.

Tape and Ammo Diagram

Figure 1



Revised: 01/29/15