Axial Lead Battery Strap PTC

0ZSC Series

HF Pb 0ZSC Series   RoHS Compliant

Application

Rechargeable battery packs, Lithium cell and battery packs

Product Features

Low profile, Low resistance, High hold current, Solid state

- Full compliance with EU Directive 2011/65/EU and amending directive 2015/863

Operating (Hold Current) Range

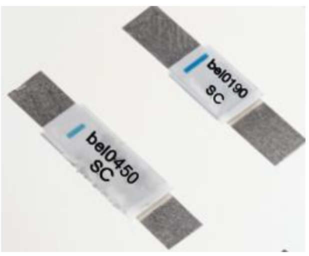
1.9A - 7.3A

Maximum Voltage

20VDC

Temperature Range

-40℃ to 85℃



UK CA CE TÜV cULus

Agency Approval

TUV (Std. EN62319-1-1, Cert. R50102187)
UL Recognized Component (Std. UL1434, File E305051)
UL Conditions of Acceptability:

1. These devices have been investigated for use in safety circuits and are suitable as a limiting device.
2. These devices have been calibrated to limit the current to 8 amps within 5 seconds, per ANSI/NFPA 70, “National Electrical Code”.

LEAD FREE = Pb
HALOGEN FREE = HF

Electrical Characteristics (23℃)

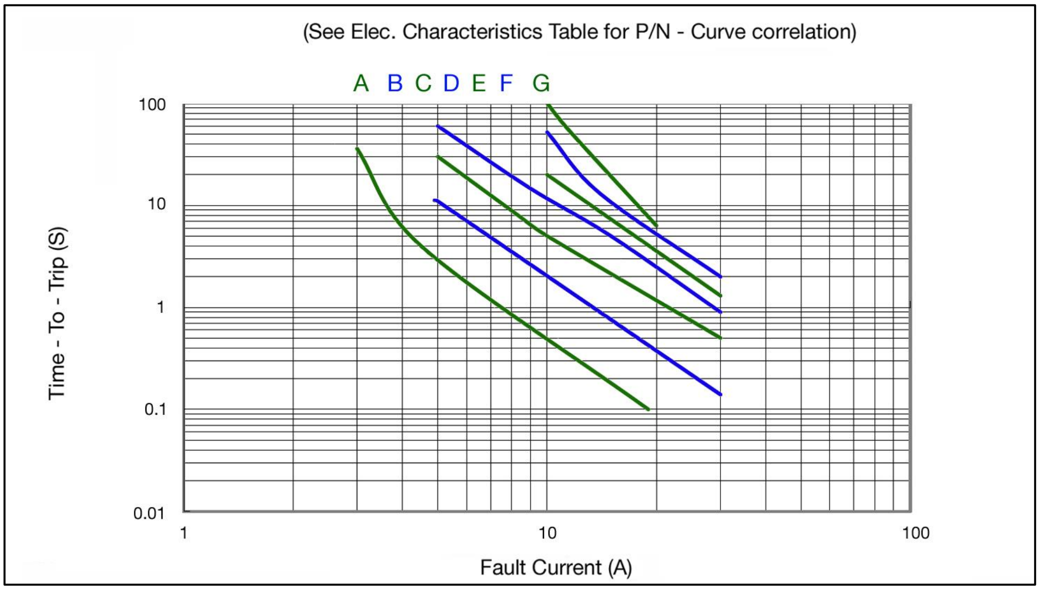
	Part Number (Bulk)	Hold Current	Trip Current	Max Time to Trip @ 5xIH	Rated Voltage	Max Current	Typical Power	Resistance Tolerance			Agency Approvals	
								Rmin	Rmax	R1max	cULus	TÜV
		IH, A	IT, A	Seconds	Vmax, Vdc	Imax, A	Pd, W	Ohms	Ohms	Ohms		
A	0ZSC0190FF1E	1.9	3.9	5.0	20	100	1.2	0.039	0.072	0.102	Y	Y
B	0ZSC0260FF1E	2.6	5.8	5.0	20	100	2.5	0.020	0.042	0.063	Y	Y
C	0ZSC0380FF1E	3.8	8.3	5.0	20	100	2.5	0.013	0.026	0.037	Y	Y
D	0ZSC0450FF1E	4.5	8.9	5.0	20	100	2.5	0.011	0.020	0.028	Y	Y
E	0ZSC0550FF1E	5.5	10.5	5.0	20	100	2.8	0.009	0.016	0.022	Y	Y
F	0ZSC0600FF1E	6.0	11.7	5.0	20	100	2.8	0.007	0.014	0.019	Y	Y
G	0ZSC0730FF1E	7.3	14.1	5.0	20	100	3.3	0.006	0.012	0.015	Y	Y

IH Hold Current-maximum current at which the device will not trip in still air at 23℃.
IT Trip current-minimum current at which the device will always trip in still air at 23℃.
Imax Maximum fault current device can withstand without damage at rated voltage (Vmax).
Vmax Maximum voltage device can withstand without damage at its rated current.
Pd Typical power dissipated by device when in tripped state in 23℃ still air environment.
Rmin Minimum device resistance at 23℃.
Rmax Maximum device resistance at 23℃.
R1max Maximum device resistance at 23℃, 1 hour after initial device trip, or after being soldered to PCB in end application.

PTC's – Basic Theory of Operation / "Tripped" Resistance Explanation

Fundamentally, a Bel PTC consists of a block of polymeric material containing conductive filler and bonded between two conductive, planar terminations.
At currents below the device IHOLD rating, AND at temperatures below 100C, the PTC maintains a resistance value below its R1 MAX rating.
As the device's temperature approaches 130C, either due to an increase in ambient temperature or a current exceeding its I TRIP rating, volumetric expansion of the filled polymer breaks apart the majority of conductive pathways across the terminals created by chain contact of adjacent filler particles or device resistance increases sharply by several orders of magnitude.
At the much higher "Tripped" resistance, there is just enough leakage current to allow internal heating to "hold" the device in its tripped state (around 125C) until power is interrupted. Once power is removed, the PTC's core cools and contracts allowing conductive chains to reform and return the device to its low resistance state.
The catalog data for each device specifies a "Typical Power" value. This is the power required to exactly match the heat lost by the tripped device to its ambient surroundings at 23C. By Ohm's Law, power can be stated as: W = E^2/R. Thus the approximate resistance of a "Tripped" PTC can be determined by: R = E^2/W, where "E" is the voltage appearing across the PTC (usually the supply's open circuit voltage), and "W" is the Typical Power value for the particular PTC.
Since the PPTC acts to maintain a constant internal temperature, its apparent resistance will change based upon applied voltage and, to a lesser degree, ambient conditions. Consider the following example....
A PTC with a Typical Power of 1 watt protecting a circuit using a 60V supply will demonstrate an apparent, tripped resistance "R" of:
R = 60^2/1 = 3,600 ohms
This same tripped device when used to protect a 12V circuit would now present an apparent resistance of:
R = 12^2/1 = 144 ohms
The value for Typical Power is "typical" because any physical factors that affect heat loss (such as ambient temperature or air convection) will somewhat alter the level of power that the PTC needs to maintain its internal temperature. In short, PTCs do not exhibit a constant, quantifiable tripped resistance value.

Average Time Current Characteristic Curve at 23°C



The Average Time Current Characteristic Curve and Temperature Rerating Curve are affected by a number of variables and these curves are provided for guidance only.

Bel Fuse Inc.
300 Executive Drive, Suite 300,
West Orange, NJ 07052 USA
+1 201.432.0463
Bel.US.CS@belf.com
belfuse.com/circuit-protection

Physical Specifications

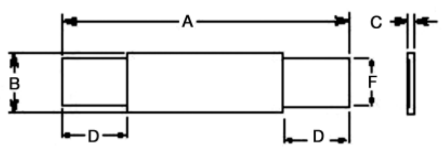
Lead material:
0.13mm nominal thickness, quarter-hard nickel. size / diameter as shown in Drawings and Table under Product Dimensions.
Insulating material:
Polyester tape

PTC Marking

"bel" or "b", IH code and "SC" .

Product Dimensions

All dimensions in mm.



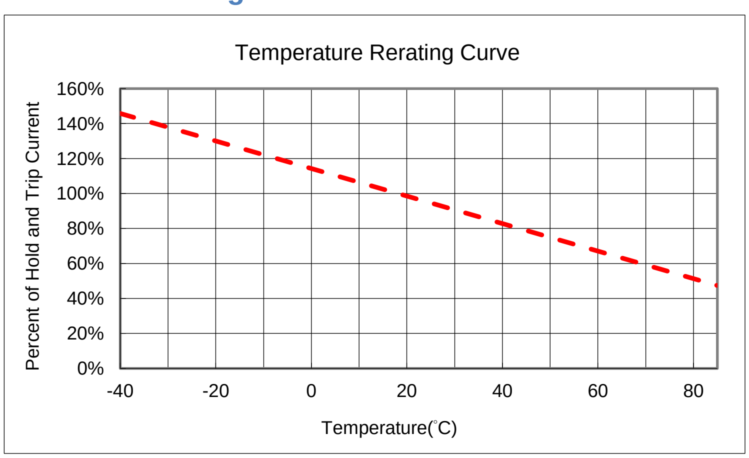
Top view

Part Number	A		B		C		D		F	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
0ZSC0190FF	19.9	22.1	4.9	5.5	0.6	1.0	5.5	7.5	3.9	4.1
0ZSC0260FF	20.9	23.1	4.9	5.5	0.6	1.0	4.1	5.5	3.9	4.1
0ZSC0380FF	24.0	26.0	6.9	7.5	0.6	1.0	4.1	5.5	4.9	5.1
0ZSC0450FF	24.0	26.0	9.9	10.5	0.6	1.0	5.3	6.7	5.9	6.1
0ZSC0550FF	35.0	37.0	6.9	7.5	0.6	1.0	5.3	6.7	4.9	5.1
0ZSC0600FF	24.0	26.0	13.9	14.5	0.6	1.0	4.1	5.5	5.9	6.1
0ZSC0730FF	27.1	29.1	13.9	14.5	0.6	1.0	4.1	5.5	5.9	6.1

Temperature Derating Table

	Temperature Derating									
I Hold Value	**-40**	**-20**	**0**	**23**	**30**	**40**	**50**	**60**	**70**	**85**
0ZSC	142%	129%	115%	100%	94%	85%	76%	67%	58%	44%

Thermal Derating Curve



Cautionary Notes

1. Operation beyond the specified maximum ratings or improper use may result in damage and possible electrical arcing and/or flame.
2. These Polymer PTC (PPTC) devices are intended for protection against occasional overcurrent/overtemperature fault conditions and may not be suitable for use in applications where repeated and/or prolonged fault conditions are anticipated.
3. Avoid contact of PTC device with chemical solvent. Prolonged contact may adversely impact the PTC performance.
4. These PTC devices may not be suitable for use in circuits with a large inductance, as the PTC trip can generate circuit voltage spikes above the PTC rated voltage.
5. These devices are intended for use in DC voltage applications only. Use in AC voltage applications should be first discussed with Bel Fuse engineering.
6. Not recommended for use on potted or conformal coated PCB's. Restriction of free air flow could affect electrical performance and/or result in device failure. Consult Bel Fuse engineering.

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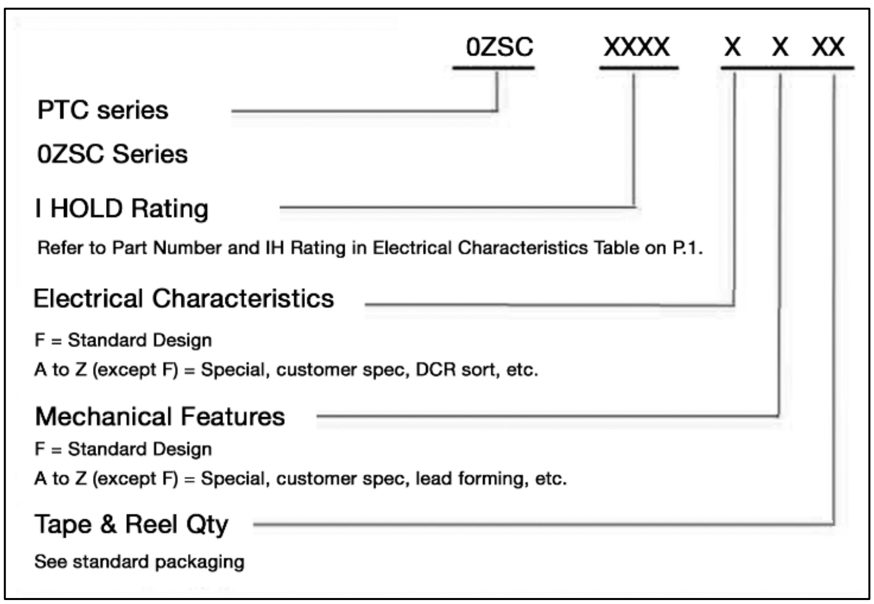
Installation Guidelines

- Due to the fact that PPTC devices operate by thermal expansion of the conductive polymer, it is imperative that designs allow enough space over the life of the product to accommodate the expansion. If the device is used in designs that do not account for the expansion or if the device is placed under pressure, the device cannot be relied on to properly protect against damage caused by fault conditions.
- Bending, twisting, or leaving the PPTC device in tensile conditions will lessen the PPTC device's ability to protect against damage caused by electrical faults. The PPTC device should experience no force after installation. Any mechanical damage to the PPTC device can affect the performance and should therefore be avoided.
- Avoid contact of PPTC device with chemical solvent, including some inert material such as silicone based oil, lubricant, grease, cleaning agents, and etc. Prolonged contact will damage the device performance.
- Strap type PPTC devices are designed to be welded to battery cells or to pack interconnect straps. Weld placements should be a minimum of 2mm from the edge of the PPTC device, and no weld splatter should come in contact with the PPTC device. In addition, welding temperatures should not exceed the maximum operation temperature of the PPTC device.
- Strap type PPTC devices are not designed for reflow installation like flex circuits or rigid circuit boards.
- The tape used on strap type PPTC devices is not designed as an electrical insulator, its use is merely for identification and marking.

P/N Explanation and Ordering Information



Standard Packaging

Packaging Option	Packaging Quantity	Packaging Code
Bulk	3000	1E

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