

## VLD-Axial Leaded Strap Lead(Pb) Free PTC Devices

- The new VLD Axial Leaded Strap Lead(Pb) Free PTC devices are designed based on a proprietary conductive polymer material, to provide both overcurrent and overtemperature protection for rechargeable battery cells.
- The VLD Axial Leaded Strap Lead(Pb) Free devices featuring a slim, low profile and low resistance design and are ideal to install directly on the latest generations of battery cells for longer battery run time.
- Similar to the Everfuse VTD Axial Strap devices, VLD products provide reliable, noncycling protection against overcharging and short circuits events and increase the battery safety level.
- Agency Approval: UL/ CSA File # E201431

TÜV Certificate # R9956421



Polytronics Technology Corp  
REGISTERED TO QS9000, TL9000  
ISO9001 (version 2002), and ISO 14001  
CERTIFICATE NO. A8727 and A16871



### 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 Approval
						Current (A)	Time (Sec.)	$R_{min}$ ( $\Omega$ )	$R_{max}$ ( $\Omega$ )	$R_{1max}$ ( $\Omega$ )	
VLD170F	1.70	4.10	12	100	1.4	8.50	5.00	0.018	0.032	0.064	UL/CSA/TÜV
VLD175LF	1.75	4.20	12	100	1.4	8.75	5.00	0.017	0.031	0.062	UL/CSA/TÜV
VLD175LF-2	1.75	4.20	12	100	1.4	8.75	5.00	0.017	0.031	0.062	UL/CSA/TÜV
VLD175XLF	1.75	4.20	12	100	1.4	8.75	5.00	0.017	0.031	0.062	UL/CSA/TÜV
VLD230F	2.30	5.00	12	100	2.5	10.00	5.00	0.012	0.018	0.036	UL/CSA/TÜV

Note:  $I_{hold}$  = Hold current: maximum current device will pass without tripping in 25°C still air.

$I_{trip}$  = Trip current: minimum current at which the device will trip in 25°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 25°C still air.

$R_{min}$  = Minimum resistance of device in initial (un-soldered) state.

$R_{1max}$  = Maximum resistance of device at 25°C measured one hour after tripping for 20 sec.

**Caution: Operation beyond the specified rating may result in damage and possible arcing and flame.**

**Recognitions: UL, CSA, TÜV recognized.**

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## VLD-Axial Leaded Strap Lead(Pb) Free PTC Devices

### How to Select a Polymer PTC fuse:

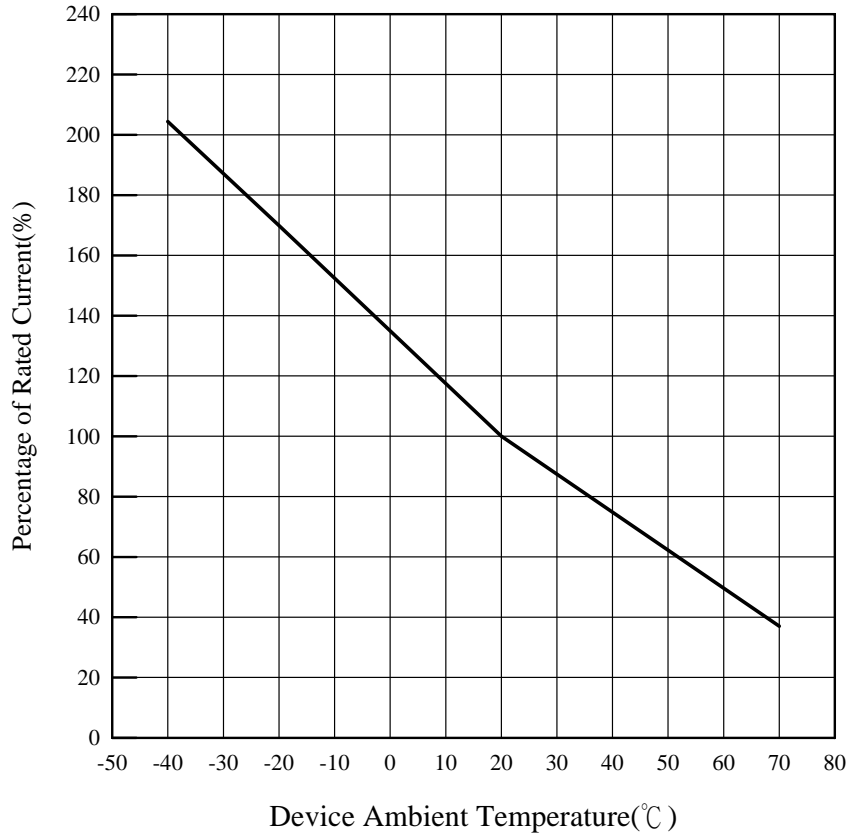
- (1) Determine the following operating parameters for the circuits:
  - (A) Normal Operating Current (I hold)
  - (B) Maximum Circuit Voltage (V max)
  - (C) Maximum Interrupt Current (I max)
  - (D) Normal Operating Temperature (min<sup>°C</sup>/max<sup>°C</sup>)
- (2) Select the device form factor and dimension suitable for the application:
  - Surface Mount Device (SMD Series)
  - Radial Leaded Device (RLD Series)
  - Axial Leaded Strap Device (STD, VTD, VLD, LTD, LRD Series)
  - Other Custom-designed Device (Disc/Chip)
- (3) Compare the maximum ratings for V max and I max of the PTC device with the circuit in application and make sure that the circuit's requirement does not exceed the device ratings.
- (4) Check that the PTC device's trip time (time-to-trip) will protect the circuit.
- (5) Verify that the circuit operating temperatures are within the PTC device's normal operating temperature range.
- (6) Verify the performance and suitability of the chosen PTC device in the application.

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**THERMAL DERATING CURVE FOR VLD LF SERIES**



**THERMAL DERATING CHART FOR VLD LF SERIES - Ihold (Amps)**

Model	Ambient Operation Temperature							
	-40°C	-20°C	0°C	25°C	40°C	50°C	60°C	70°C
VLD170F	3.5	2.9	2.4	1.70	1.2	1.0	0.7	0.3
VLD175LF	3.5	2.9	2.4	1.75	1.3	1.0	0.8	0.3
VLD175LF-2	3.5	2.9	2.4	1.75	1.3	1.0	0.8	0.3
VLD175XLF	3.5	2.9	2.4	1.75	1.3	1.0	0.8	0.3
VLD230F	5.0	4.2	3.4	2.30	1.7	1.3	0.9	0.4

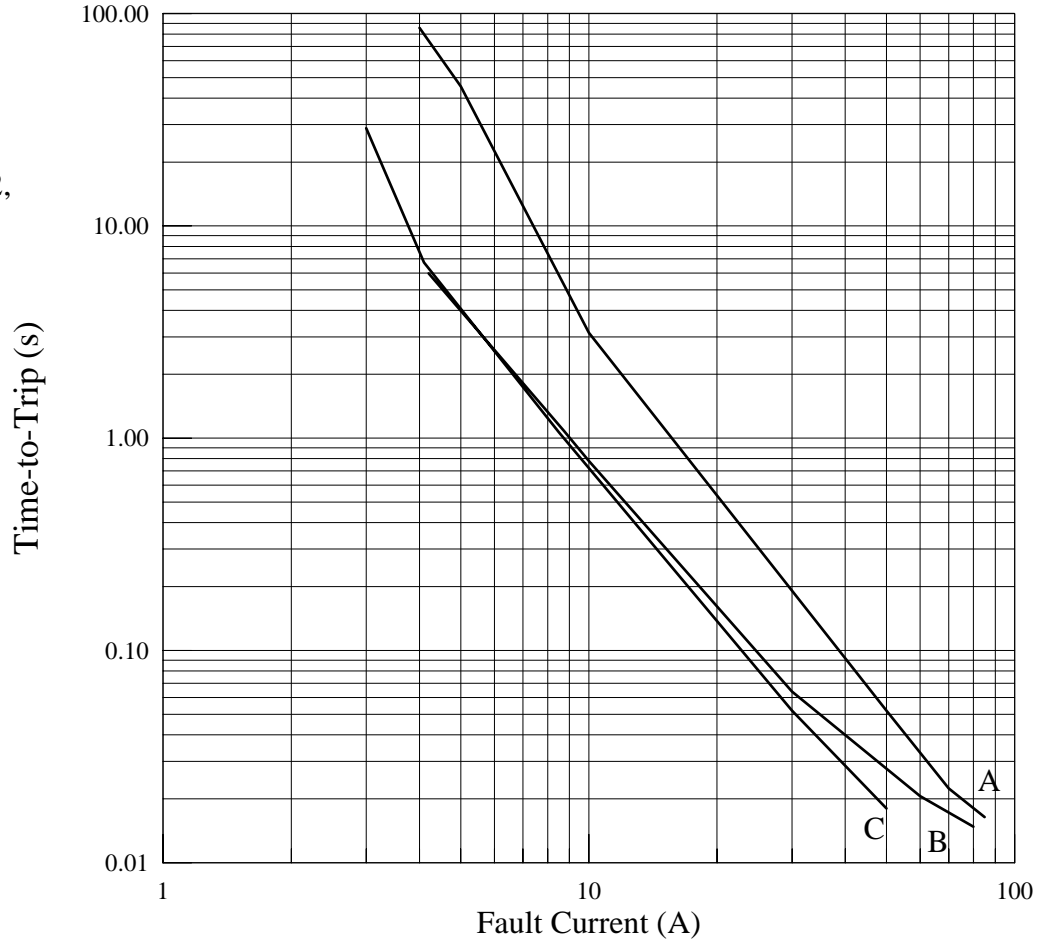
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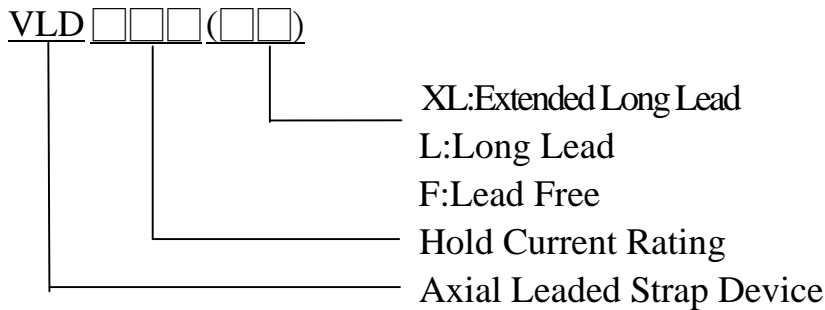
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**AVERAGE TIME-CURRENT CURVE FOR VLD LF SERIES**

- A:VLD230F
- B:VLD175LF,  
VLD175LF-2,  
VLD175XLF
- C:VLD170F



**PART NUMBERING SYSTEM**



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# VLD-Axial Leaded Strap Lead(Pb) Free PTC Devices

Figure 1

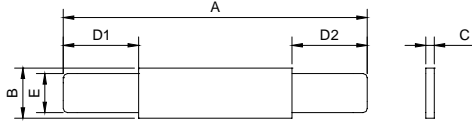
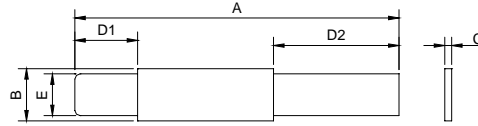


Figure 2



## PHYSICAL DIMENSIONS (mm)

Part Number	A		B		C		D1		D2		E		
	Fig.	Min.	Max.	Min.	Max.	Min	Max	Min	Max	Min	Max	Min.	Max.
VLD170F	1	20.8	23.2	3.5	3.9	--	0.8	4.5	6.5	4.5	6.5	2.4	2.6
VLD175LF	2	29.3	31.7	2.9	3.3	--	0.8	5.2	6.8	10.0	12.5	2.4	2.6
VLD175LF-2	2	29.3	31.7	2.9	3.3	--	0.8	5.2	6.8	10.0	12.5	2.4	2.6
VLD175XLF	2	25.5	28.2	3.5	3.9	--	0.8	8.7	10.3	5.7	7.3	2.4	2.6
VLD230F	1	20.9	23.1	4.9	5.3	--	0.8	4.1	5.8	4.1	5.8	3.9	4.1

## ENVIRONMENTAL SPECIFICATIONS

Operating/Storage Temperature	-40°C to +85°C	
Passive Aging	+60°C, 1000 hours	±20% typical resistance change
	-40°C, 1000 hours	±5% typical resistance change
Humidity Aging	+60°C, 95%R.H. 1000 hours	±30% typical resistance change
Thermal Shock	MIL-STD-202G, Method 107G	
	+85°C to -40°C 10 times	±5% typical resistance change
Vibration	MIL-STD-883E, Method 2026	No change

## PHYSICAL SPECIFICATIONS

Lead Material	0.13mm nominal thickness, quarter-hard nickel
Insulating Material	Polyester tape

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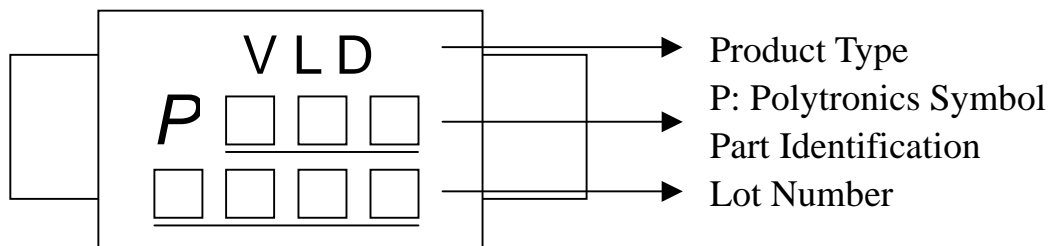
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## PACKAGING INFORMATION

Product Description	Part I.D.	Bag Quantity(ea)	Standard Package(ea)
VLD170F	170F	500	10000
VLD175LF	175LF	500	10000
VLD175LF-2	175LF-2	500	10000
VLD175XLF	175XLF	500	10000
VLD230F	230F	500	10000

\*All models are packaged in bulk.

## PART MARKING SYSTEM



## CROSS REFERENCE

Polytronics/ EVERFUSE™	Cross Reference
	Raychem/ PolySwitch®
VLD170F	VLR170F
VLD175LF	VLR175LF
VLD175LF-2	N/A
VLD175XLF	N/A
VLD230F	VLR230F

“EVERFUSE” is a registered trademark of Polytronics Technology Corp.

“PolySwitch” is a registered trademark of Raychem Corporation.

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