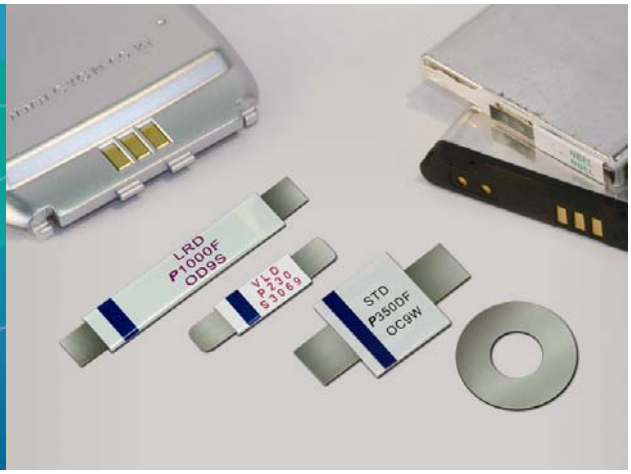
POLYTRONICS
POLYTRONICS TECHNOLOGY CORP.

PRODUCT
DATASHEET



VTD-Axial Leaded Strap Lead(Pb) Free PTC Devices

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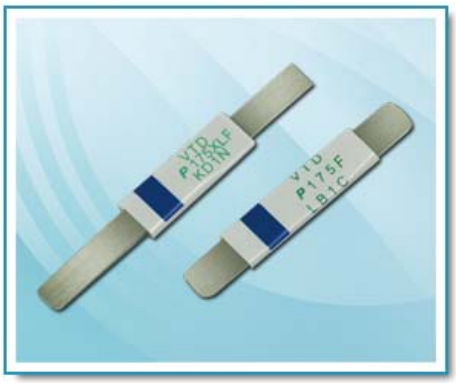
Description



- The new LRD Axial Leaded Strap Lead(Pb) Free PTC device are designed based on a proprietary conductive polymer material, to provide both overcurrent protection for rechargeable battery cells.
- The LRD Axial Leaded Strap Lead(Pb) Free devices featuring a slim, low profile and low resistance design and are ideal to be installed directly on the latest generations of battery cells for longer battery run time.
- LRD products provide reliable, non-cycling protection against overcharging and short circuits events and increase the battery safety level.

Agency Approval and Environmental Compliance

Agency	File Number
c UL us	E201431
TÜV	R50103314

Regulation	Standard
RoHS	2011/65/EU
Halogen Free	IEC 61249-2-21:2003

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 Approval	
						Current (A)	Time (Sec.)	R_{min} (Ω)	R_{max} (Ω)	R_{1max} (Ω)	c UL us	TÜV
VTD170F	1.70	3.40	16	100	1.4	8.50	3.0	0.030	0.052	0.105	✓	✓
VTD175F	1.75	3.80	16	100	1.4	9.00	3.0	0.025	0.045	0.090	✓	✓
VTD175LF	1.75	3.80	16	100	1.4	9.00	3.0	0.025	0.045	0.090	✓	✓
VTD175XLF	1.75	3.80	16	100	1.4	8.75	5.0	0.029	0.051	0.102	✓	✓
VTD175ELF	1.75	3.60	16	100	1.4	8.75	5.0	0.029	0.051	0.102	✓	✓
VTD200F	2.00	4.50	16	100	1.5	10.00	4.0	0.021	0.039	0.080	✓	✓
VTD210F	2.10	4.70	16	100	1.5	10.00	5.0	0.018	0.030	0.060	✓	✓
VTD210SF	2.10	4.70	16	100	1.5	10.00	5.0	0.018	0.030	0.060	✓	✓
VTD210SSF	2.10	4.70	16	100	1.5	10.00	5.0	0.018	0.030	0.060	✓	✓
VTD240F	2.40	5.40	16	100	1.5	12.00	4.0	0.015	0.026	0.052	✓	✓

VTD-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 ºC /max ºC)

(2) Select the device form factor and dimension suitable for the application:

Axial Leaded Strap Device (SLD, VTD, LTD, LRD, STD, LTD Series)

Surface Mount Device (SMD Series)

Radial Leaded Device (RLD 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.

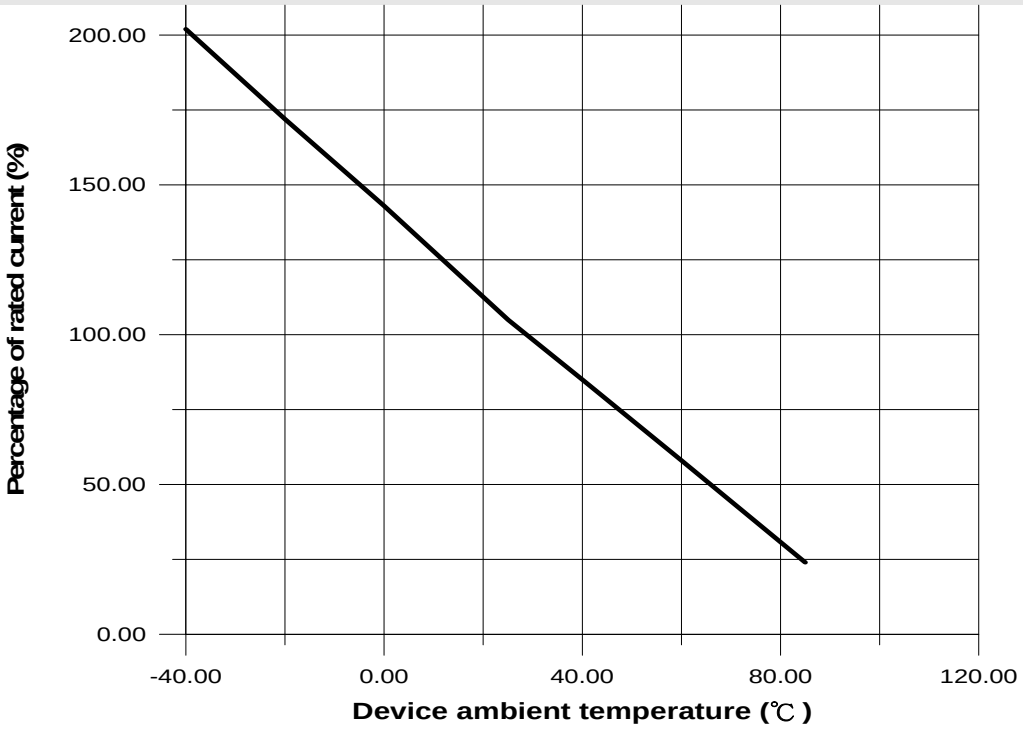
(4) Check that the PTC device's trip time (time-to-trip) will protect the circuit.

(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.

VTD-Axial Leaded Strap Lead(Pb) Free PTC Devices

THERMAL DERATING CURVE FOR VTD LF SERIES



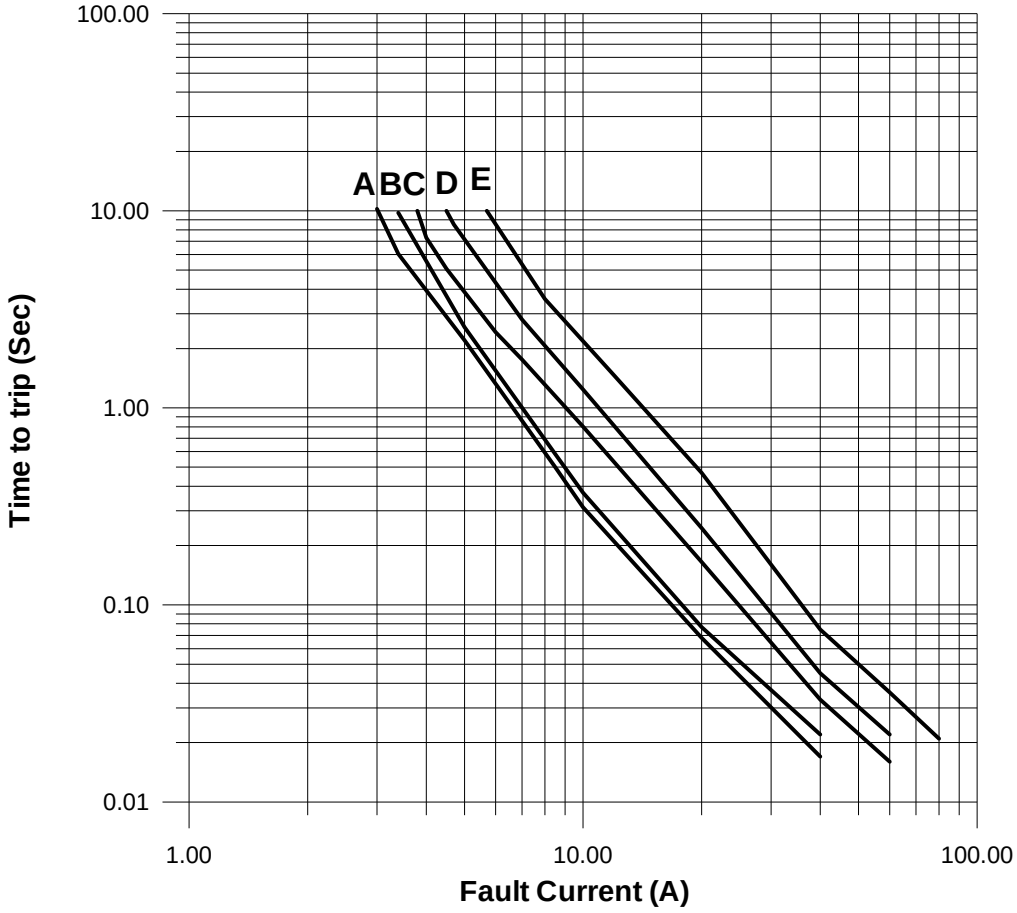
THERMAL DERATING CHART FOR VTD LF SERIES - Ihold (Amps)

Model	Ambient Operation Temperature								
	-40 ºC	-20 ºC	0 ºC	25 ºC	40 ºC	50 ºC	60 ºC	70 ºC	85 ºC
VTD170F	3.20	2.70	2.20	1.70	1.30	1.00	0.80	0.50	0.10
VTD175F	3.20	2.70	2.20	1.75	1.30	1.00	0.80	0.50	0.10
VTD175LF	3.20	2.70	2.20	1.75	1.30	1.00	0.80	0.50	0.10
VTD175XLF	3.20	2.70	2.20	1.75	1.30	1.00	0.80	0.50	0.10
VTD175ELF	3.20	2.70	2.20	1.75	1.30	1.00	0.80	0.50	0.10
VTD200F	3.70	3.20	2.60	2.00	1.50	1.20	0.90	0.50	0.10
VTD210F	4.10	3.50	2.90	2.10	1.60	1.30	1.00	0.70	0.10
VTD210SF	4.10	3.50	2.90	2.10	1.60	1.30	1.00	0.70	0.10
VTD210SSF	4.10	3.50	2.90	2.10	1.60	1.30	1.00	0.70	0.10
VTD240F	4.40	3.70	3.10	2.40	1.80	1.50	1.20	0.90	0.10

VTD-Axial Leaded Strap Lead(Pb) Free PTC Devices

AVERAGE TIME-CURRENT CURVE FOR VTD LF SERIES

A=VTD170F
B=VTD175F
C=VTD200F
D=VTD210SF
E=VTD240F



PART NUMBERING SYSTEM

VTD □□□ (S)F

- S: Slitted Lead (Optional)
- L: Long Lead
- F: Lead Free
- Hold Current Rating
- Axial Leaded Strap Device

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PHYSICAL DIMENSIONS (mm)

Figure 1

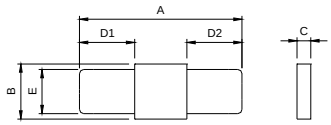


Figure 2

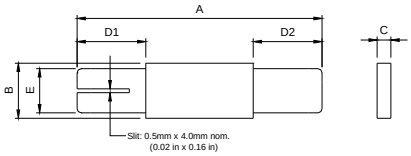


Figure 3

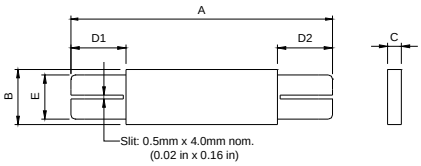


Figure 4

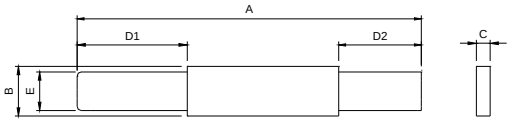
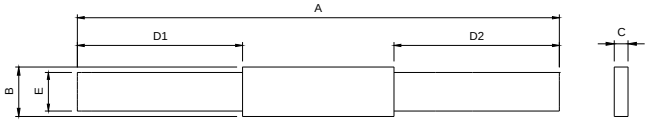


Figure 5



Part Number	Fig.	A		B		C		D1		D2		E	
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
VTD170F	1	15.4	17.5	7.0	7.4	0.5	0.8	4.0	6.2	4.0	6.2	3.9	4.1
VTD175F	1	20.9	22.2	3.5	3.8	0.5	0.8	4.0	5.0	4.0	5.0	2.9	3.1
VTD175LF	1	26.0	28.0	3.5	3.8	0.5	0.8	6.0	-	6.0	-	2.9	3.1
VTD175XLF	2	25.5	28.2	3.5	3.9	0.5	0.8	8.7	10.3	5.7	7.3	2.4	2.6
VTD175ELF	3	38.8	41.2	3.5	3.9	0.6	0.8	18.7	20.3	8.7	10.3	2.4	2.6
VTD200F	1	20.9	23.1	3.8	4.3	0.6	0.7	4.0	5.0	4.0	5.0	2.9	3.1
VTD210F	2	20.9	23.1	4.9	5.3	0.6	0.8	4.1	5.8	4.1	5.8	3.9	4.1
VTD210SF	4	20.9	23.1	4.9	5.3	0.6	0.8	4.1	5.8	4.1	5.8	3.9	4.1
VTD210SSF	5	20.9	23.1	4.9	5.3	0.6	0.8	4.1	5.8	4.1	5.8	3.9	4.1
VTD240F	1	24.2	26.2	4.9	5.3	0.6	0.8	5.0	5.7	5.0	5.7	3.9	4.1

ENVIRONMENTAL SPECIFICATIONS

Operating Temperature	-40°C to +85°C	
Passive Aging	+60°C, 1000 hours	±10% typical resistance change
Humidity Aging	+60°C, 95%R.H. 1000 hours	±10% typical resistance change
Thermal Shock	MIL-STD-202G, Method 107G +85°C to -40°C, 10 times	 ±5% typical resistance change
Vibration	MIL-STD-883G, Method 2026	No change
Storage Condition	0°C to 35°C, ≦70%RH	

VTD-Axial Leaded Strap Lead(Pb) Free PTC Devices

PHYSICAL SPECIFICATIONS

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

◎Specifications are subject to change without notice

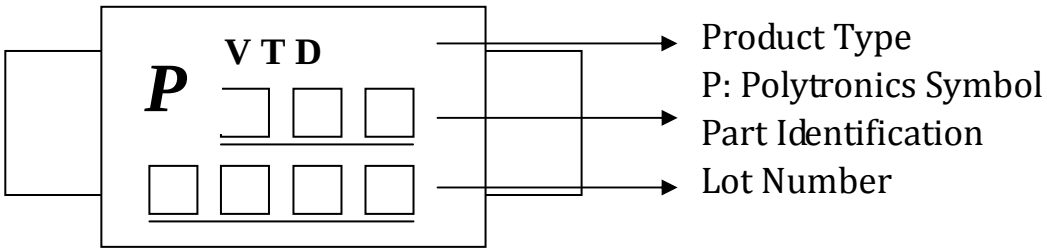
PACKAGING INFORMATION

Product Description	Bag Quantity(ea)	Standard Package(ea)
VTD170F	500	10,000
VTD175F	500	10,000
VTD175LF	500	10,000
VTD175XLF	500	10,000
VTD175ELF	500	10,000
VTD200F	500	10,000
VTD210F	500	10,000
VTD210SF	500	10,000
VTD210SSF	500	10,000
VTD240F	500	10,000

◎

All models are packaged in bulk.

PART MARKING SYSTEM



VTD-Axial Leaded Strap Lead(Pb) Free PTC Devices

CROSS REFERENCE

Polytronics/ EVERFUSE™	Cross Reference	
	Raychem/ PolySwitch®	Bourns/ Multifuse®
VTD170F	VTP170F	MF-VS170
VTD175F	VTP175UF	N/A
VTD175LF	N/A	N/A
VTD175XLF	N/A	N/A
VTD175ELF	N/A	N/A
VTD200F	VTP200GF	N/A
VTD210F	VTP210GF	MF-VS210G
VTD210SF	N/A	N/A
VTD210SSF	VTP210SSF	N/A
VTD240F	VTP240F	N/A

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"Multifuse" is a registered trademark of Bourns , Inc.

"PolySwitch" is a registered trademark of Raychem Corporation.

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