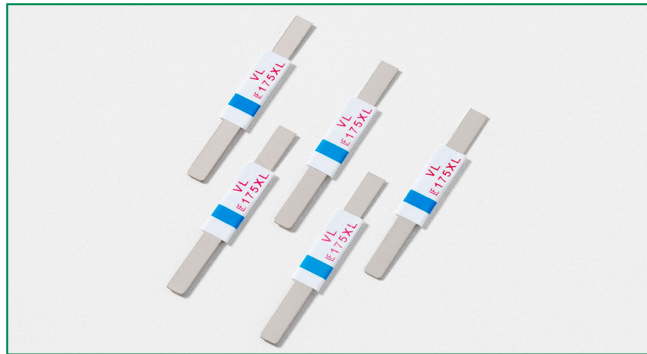


### VL Series



#### Description

The new VL Series device provides reliable, noncycling protection against overcharging and short circuits events for rechargeable battery cells where resettable protection is desired.



#### Features

- RoHS compliant and lead-free
- Compact design saves board space
- Weldable Nickel terminals
- Low resistance
- Slim, low profile design



#### Applications

- Rechargeable battery cell protection

#### Agency Approvals

AGENCY	AGENCY FILE NUMBER
	E183209
	R50119583

#### 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.)	$R_{min}$ ( $\Omega$ )	$R_{typ}$ ( $\Omega$ )	$R_{1max}$ ( $\Omega$ )		
12VL175XL	1.75	4.20	12	100	1.4	8.75	5.00	0.017	0.031	0.062	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.

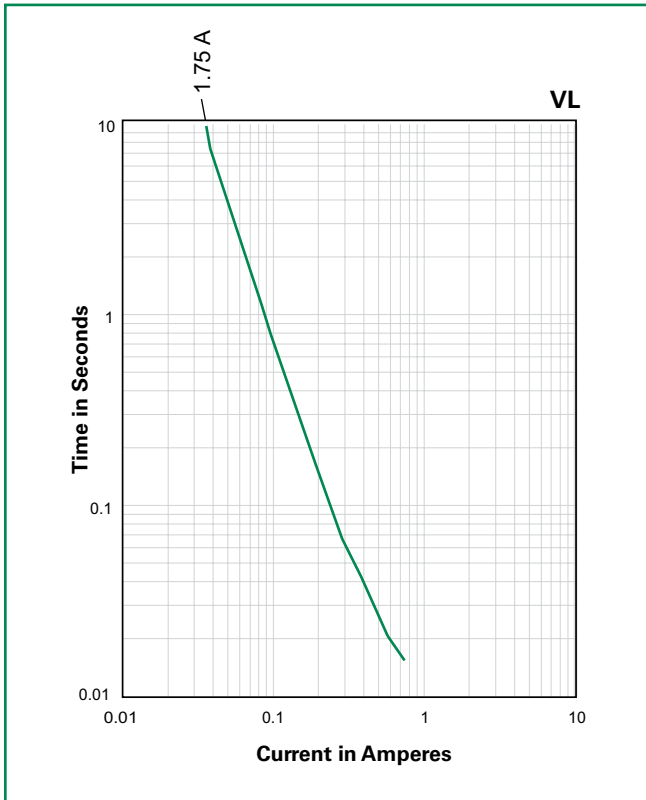
#### Temperature Derating

Part Number	Ambient Operation Temperature							
	-40°C	-20°C	0°C	20°C	40°C	50°C	60°C	70°C
12VL175XL	Hold Current (A)							
	3.5	2.9	2.4	1.75	1.3	1.0	0.8	0.3

#### WARNING

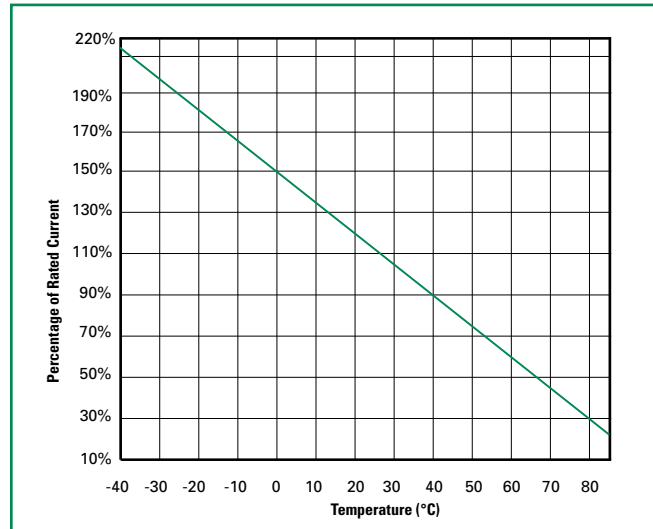
- Users shall independently assess the suitability of these devices for each of their applications
- Operation of these devices beyond the stated maximum ratings could result in damage to the devices and lead to electrical arcing and/or fire
- These devices are intended to protect against the effects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

**Average Time Current Curves**



The average time current curves and Temperature Rerating curve performance is affected by a number of 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

**Physical Specifications**

<b>Terminal Material</b>	0.13mm nominal thickness, quarter-hard Nickel
<b>Insulating Material</b>	Polyester tape

**Environmental Specifications**

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

**Additional Information**



**Datasheet**

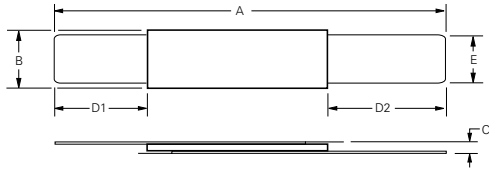


**Resources**



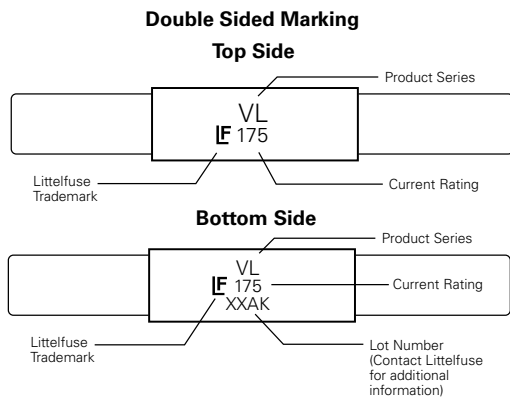
**Samples**

**Dimensions**

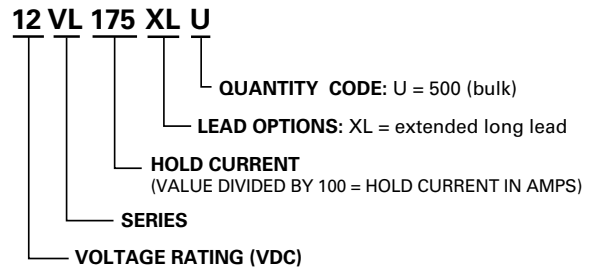


Part Number	Figure	A				B				C				D1		D2		E							
		Inches		mm		Inches		mm		Inches		mm		Inches		mm		Inches		mm					
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.				
12VL175XL	2	1.00	1.11	25.50	28.20	0.14	0.15	3.50	3.90	--	0.03	--	0.80	0.34	0.41	8.70	10.30	0.22	0.29	5.70	7.30	0.09	0.10	2.40	2.60

**Part Marking System**



**Part Ordering Number System**



**Packaging**

Part Number	Ordering Number	$I_{hold}$ (A)	$I_{hold}$ Codes	Packaging Option	Quantity	Quantity & Packaging Codes
12VL175XL	12VL175XLU	1.75	175	Bulk	500	U

**Disclaimer Notice - Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at [www.littelfuse.com/disclaimer-electronics](http://www.littelfuse.com/disclaimer-electronics).**