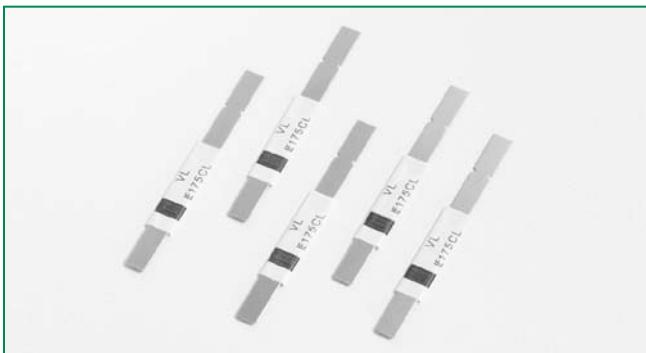


RoHS  **VL Series**

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

Agency Approvals

AGENCY	AGENCY FILE NUMBER
 UL	E183209
 TÜV	R50082521

Applications

- Rechargeable battery cell protection

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 _{typ} (Ω)	R _{1max} (Ω)	 UL	 TÜV
12VL170	1.70	4.10	12	100	1.4	8.50	5.00	0.018	0.032	0.064	X	X
12VL175L	1.75	4.20	12	100	1.4	8.75	5.00	0.017	0.031	0.062	X	X
12VL175XL	1.75	4.20	12	100	1.4	8.75	5.00	0.017	0.031	0.062	X	X
12VL230	2.30	5.00	12	100	1.5	10.00	5.00	0.012	0.018	0.036	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.

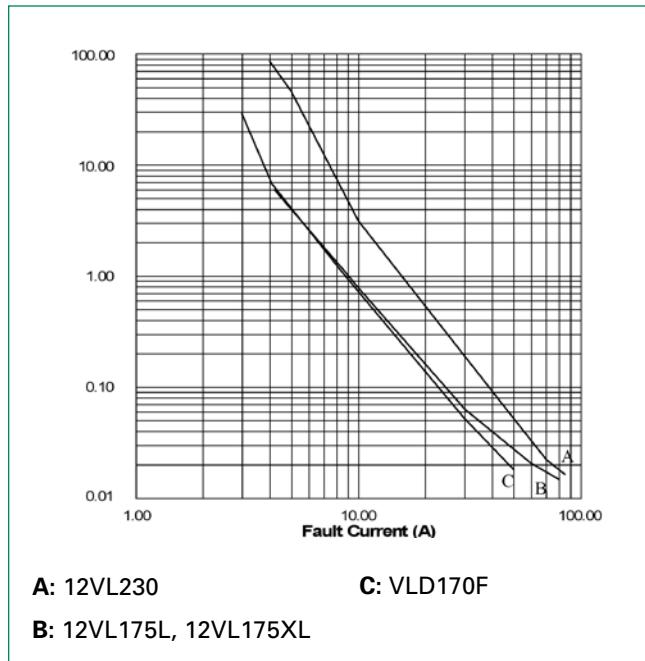
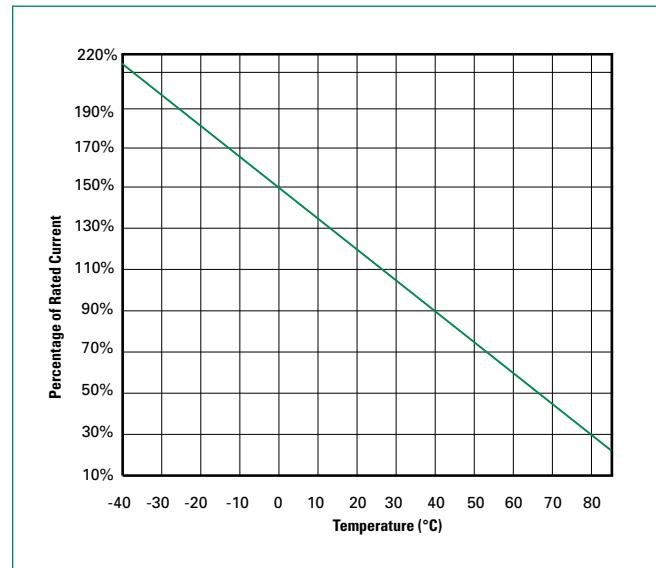
R_{typ} = Typical resistance of device in initial (un-soldered) state.

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 Rerating

Part Number	Ambient Operation Temperature							
	-40°C	-20°C	0°C	25°C	40°C	50°C	60°C	70°C
12VL170	3.5	2.9	2.4	1.70	1.2	1.0	0.7	0.3
12VL175L	3.5	2.9	2.4	1.75	1.3	1.0	0.8	0.3
12VL175XL	3.5	2.9	2.4	1.75	1.3	1.0	0.8	0.3
12VL230	5.0	4.2	3.4	2.30	1.7	1.3	0.9	0.4

Average Time Current Curves

A: 12VL230
C: VLD170F
B: 12VL175L, 12VL175XL
Temperature Rerating Curve


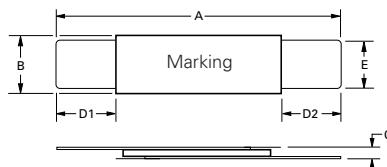
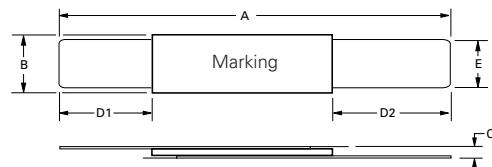
The average time current curves and temperature rerating curve performance is affected by a number of variables, and these curves provided as guidance only. Customer must verify the performance in their application.

Physical Specifications

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

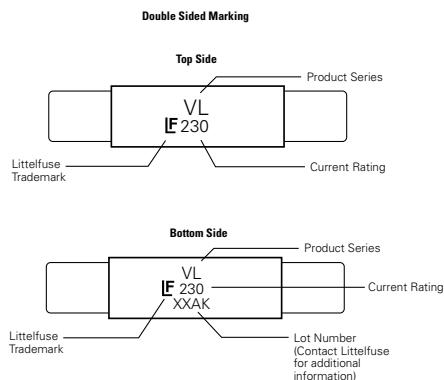
Environmental Specifications

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-883C, Method 2026 No change

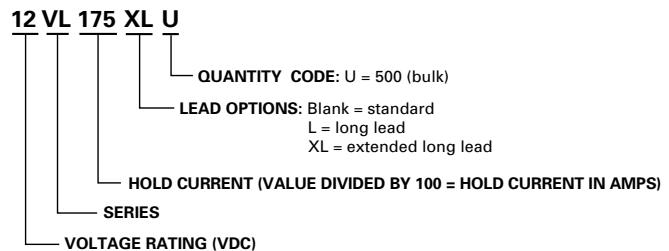
Dimensions
Figure 1

Figure 2


Part Number	A		B		C		D1		D2		E		Fig.												
	Inches		mm		Inches		mm		Inches		mm		Inches		mm										
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.									
12VL170	0.82	0.91	20.80	23.20	0.14	0.15	3.50	3.90	--	0.03	--	0.80	0.18	0.26	4.50	6.50	0.18	0.26	4.50	6.50	0.01	0.26	2.40	2.60	1
12VL175L	1.15	1.25	29.30	31.70	0.11	0.13	2.90	3.30	--	0.03	--	0.80	0.20	0.27	5.20	6.80	0.39	0.49	10.00	12.50	0.02	0.49	2.40	2.60	2
12VL175XL	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	0.01	0.29	2.40	2.60	1
12VL230	0.82	0.91	20.90	23.10	0.19	0.21	4.90	5.30	--	0.03	--	0.80	0.16	0.23	4.10	5.80	0.16	0.23	4.10	5.80	0.01	0.23	3.90	4.10	2

Part Marking System



Part Numbering System



Packaging

I_{hold} (A)	Packaging Option	Quantity	Quantity & Packaging Codes
All Ratings	Bulk	500	U