

### Description

The new LR 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
	R50082521

### Electrical Characteristics

Part Number	I <sub>hold</sub> (A)	I <sub>trip</sub> (A)	V <sub>max</sub> (Vdc)	I <sub>max</sub> (A)	P <sub>d max.</sub> (W)	Maximum Time To Trip		Resistance			Agency Approvals	
						Current (A)	Time (Sec.)	R <sub>min</sub> (Ω)	R <sub>typ</sub> (Ω)	R <sub>1max</sub> (Ω)		
15LR190	1.9	3.9	15	100	1.2	9.50	5.00	0.039	0.072	0.102	X	X
15LR190S	1.9	3.9	15	100	1.2	9.50	5.00	0.039	0.072	0.102	X	X
15LR260	2.6	5.8	15	100	2.5	13.00	5.00	0.020	0.042	0.063	X	X
15LR260S	2.6	5.8	15	100	2.5	13.00	5.00	0.020	0.042	0.063	X	X
15LR380	3.8	8.3	15	100	2.5	19.00	5.00	0.013	0.026	0.037	X	X
20LR450	4.5	8.9	20	100	2.5	22.50	5.00	0.011	0.020	0.028	X	X
20LR550	5.5	10.5	20	100	2.8	27.50	5.00	0.009	0.016	0.022	X	X
20LR600	6.0	11.7	20	100	2.8	30.00	5.00	0.007	0.014	0.019	X	X
20LR730	7.3	14.1	20	100	3.3	30.00	5.00	0.006	0.012	0.015	X	X

I<sub>hold</sub> = Hold current: maximum current device will pass without tripping in 20°C still air.

I<sub>trip</sub> = Trip current: minimum current at which the device will trip in 20°C still air.

V<sub>max</sub> = Maximum voltage device can withstand without damage at rated current (I<sub>max</sub>)

I<sub>max</sub> = Maximum fault current device can withstand without damage at rated voltage (V<sub>max</sub>)

P<sub>d</sub> = Power dissipated from device when in the tripped state at 20°C still air.

R<sub>min</sub> = Minimum resistance of device in initial (un-soldered) state.

R<sub>typ</sub> = Typical resistance of device in initial (un-soldered) state.

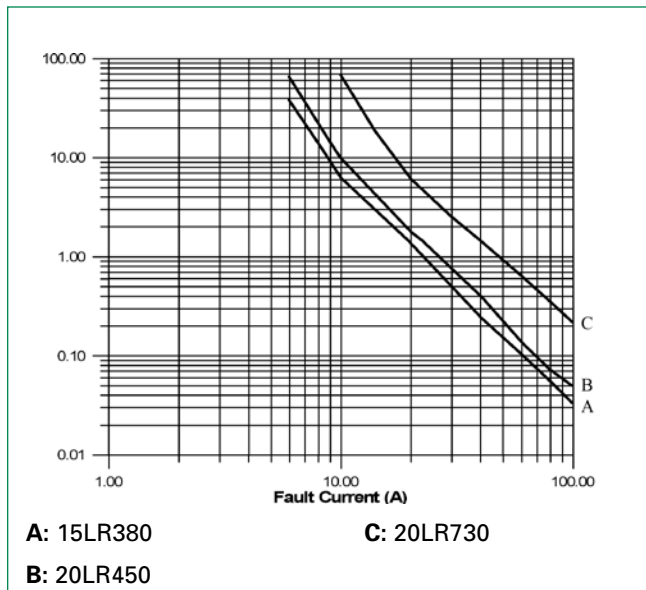
R<sub>1max</sub> = Maximum resistance of device at 20°C measured one hour after tripping or reflow soldering of 260°C for 20 sec.

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

### Temperature Derating

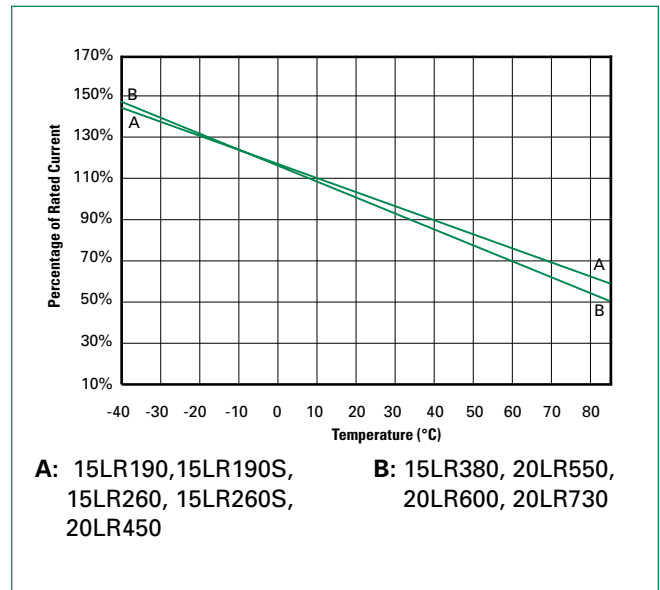
Part Number	Ambient Operation Temperature								
	-40°C	-20°C	0°C	23°C	40°C	50°C	60°C	70°C	85°C
	Hold Current (A)								
15LR190	2.80	2.50	2.30	1.90	1.60	1.50	1.40	1.20	1.00
15LR190S	2.80	2.50	2.30	1.90	1.60	1.50	1.40	1.20	1.00
15LR260	3.80	3.40	3.10	2.60	2.20	2.00	1.90	1.70	1.40
15LR260S	3.80	3.40	3.10	2.60	2.20	2.00	1.90	1.70	1.40
15LR380	5.50	4.90	4.40	3.80	3.30	3.00	2.80	2.50	2.10
20LR450	6.50	5.80	5.30	4.50	3.90	3.60	3.30	2.90	2.50
20LR550	8.00	7.10	6.20	5.50	4.70	4.30	4.00	3.60	3.00
20LR600	8.70	7.80	7.10	6.00	5.20	4.70	4.40	3.90	3.30
20LR730	10.60	9.50	8.60	7.30	6.30	5.70	5.40	4.70	4.00

### Average Time Current Curves



The average time current curves and temperature derating 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 Derating Curve



### Physical Specifications

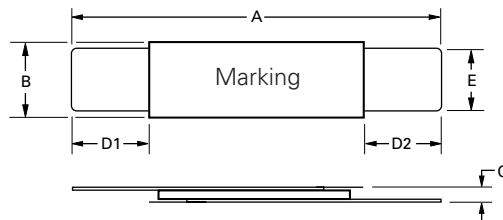
<b>Terminal Material</b>	0.13mm nominal thickness, quarter-hard nickel
<b>Insulating Material</b>	Polyester tape

### Environmental Specifications

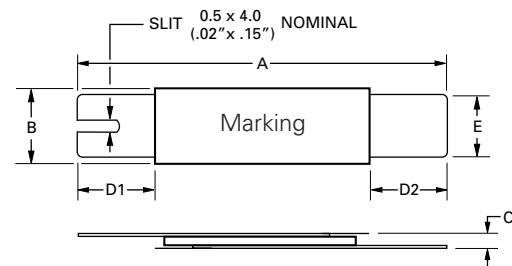
<b>Operating/Storage Temperature</b>	-40°C to +85°C
<b>Maximum Device Surface Temperature in Tripped State</b>	125°C
<b>Passive Aging</b>	+70°C, 1000 hours ±10% typical resistance change
<b>Humidity Aging</b>	+85°C, 85% R.H. 70days ±5% typical resistance change
<b>Vibration</b>	MIL-STD-883C, Method 2007.1, Condition A No change

### Dimensions

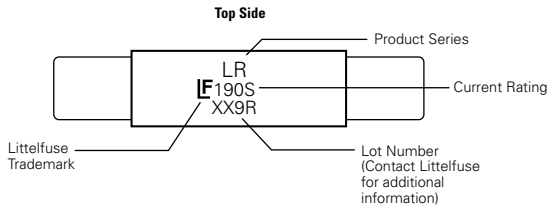
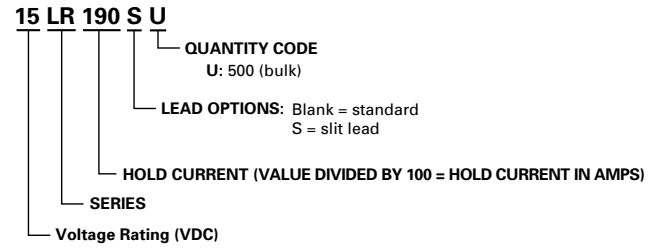
**Figure 1**



**Figure 2**



Part Number	A		B				C				D1		D2		E				Figure		
	Inches		mm		Inches		mm		Inches		mm		Inches		mm		Inches			mm	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Min.	Min.	Min.	Min.	Max.		Min.	Max.
15LR190	0.78	0.87	19.90	22.10	0.19	0.22	4.90	5.50	0.02	0.04	0.60	1.00	0.22	5.50	0.22	5.50	0.01	0.22	3.90	4.10	1
15LR190S	0.78	0.87	19.90	22.10	0.19	0.22	4.90	5.50	0.02	0.04	0.60	1.00	0.22	5.50	0.22	5.50	0.01	0.22	3.90	4.10	2
15LR260	0.82	0.91	20.90	23.10	0.19	0.22	4.90	5.50	0.02	0.04	0.60	1.00	0.16	4.10	0.16	4.10	0.01	0.16	3.90	4.10	1
15LR260S	0.82	0.91	20.90	23.10	0.19	0.22	4.90	5.50	0.02	0.04	0.60	1.00	0.16	4.10	0.16	4.10	0.01	0.16	3.90	4.10	2
15LR380S	0.94	1.02	24.00	26.00	0.27	0.30	6.90	7.50	0.02	0.04	0.60	1.00	0.16	4.10	0.16	4.10	0.01	0.16	4.90	5.10	1
20LR450S	0.94	1.02	24.00	26.00	0.39	0.41	9.90	10.50	0.02	0.04	0.60	1.00	0.21	5.30	0.21	5.30	0.01	0.21	5.90	6.10	1
20LR550S	1.38	1.46	35.00	37.00	0.27	0.30	6.90	7.50	0.02	0.04	0.60	1.00	0.21	5.30	0.21	5.30	0.01	0.21	4.90	5.10	1
20LR600S	0.94	1.02	24.00	26.00	0.55	0.57	13.90	14.50	0.02	0.04	0.60	1.00	0.16	4.10	0.16	4.10	0.01	0.16	5.90	6.10	1
20LR730S	1.07	1.15	27.10	29.10	0.55	0.57	13.90	14.50	0.02	0.04	0.60	1.00	0.16	4.10	0.16	4.10	0.01	0.16	5.90	6.10	1

**Part Marking System**

**Part Numbering System**

**Packaging**

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