

# Surface Mount Fuses

NANO<sup>2</sup>® > 277V > 15mm x 5mm Sq > Time Lag > 415 Series



## Description

Littelfuse 415 Series is a 277VAC rated, surface mount fuse in a compact 15mm x 5mm square package. It has a high interrupting rating of 1500 A, needed for circuit protection on applications where high fault current is a possibility.

## Features

- Surface mountable and comes in a small package size of 15 mm x 5 mm square
- Rated voltage at 277 VAC
- High interrupting rating of 1500 A at rated voltage
- Time Lag type designed to have relatively high melting I<sup>2</sup>t
- RoHS compliant and Halogen Free
- UL and IEC certifications

## Benefits

- Small size
- High voltage

## Application

- AC/DC power adapter
- Power supplies
- Lighting systems
- Industrial equipment
- White Goods

## Agency Approvals

Agency	Agency File Number	Ampere Range
	E10480	1A - 6.3 A
	R 50598112	1A - 6.3 A
	NA	1A - 6.3 A
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## Electrical Characteristics

% of Ampere Rating	Opening Time at 25 °C
125%	1 Hour, Min.
200%	120 seconds, Max.
1000%	1 second, Max

## Additional Information



Resources



Accessories



Samples

## Electrical Specifications

Ampere Rating (A)	Amp Code	Max Voltage Rating (V)	Interrupting Rating	Nominal Cold Resistance (Ohms)	Nominal Melting I <sup>2</sup> t (A <sup>2</sup> sec)*	Agency Approvals				
1.0	001.	277	1500A @ 277VAC 1500A @ 250VDC	0.400	3.6	X	X	X	X	X
1.25	1.25	277		0.267	4.5	X	X	X	X	X
2.0	002.	277		0.125	12.0	X	X	X	X	X
2.5	02.5	277		0.091	25.0	X	X	X	X	X
3.15	3.15	277		0.054	37.0	X	X	X	X	X
4.0	004.	277		0.040	60.0	X	X	X	X	X
5.0	005.	277		0.025	110.0	X	X	X	X	X
6.3	06.3	277		0.0168	200.0	X	X	X	X	X

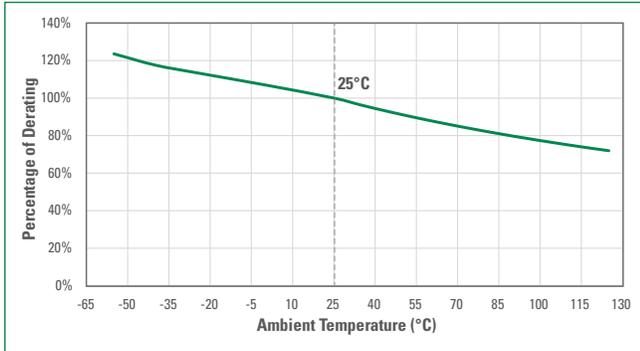
**\* Notes:**

1. Nominal Cold Resistance measured at less than 10% of rated current at 23° C.
2. Nominal Melting I<sup>2</sup>t is measured at 10 the Ampere Rating (I<sub>n</sub>)
3. Agency Approval Table key: X = Approved or Certified, P = Pending and Blank = Not Approved
4. If you have special electrical characteristic needs, contact Littelfuse Sales to learn more about application specific options

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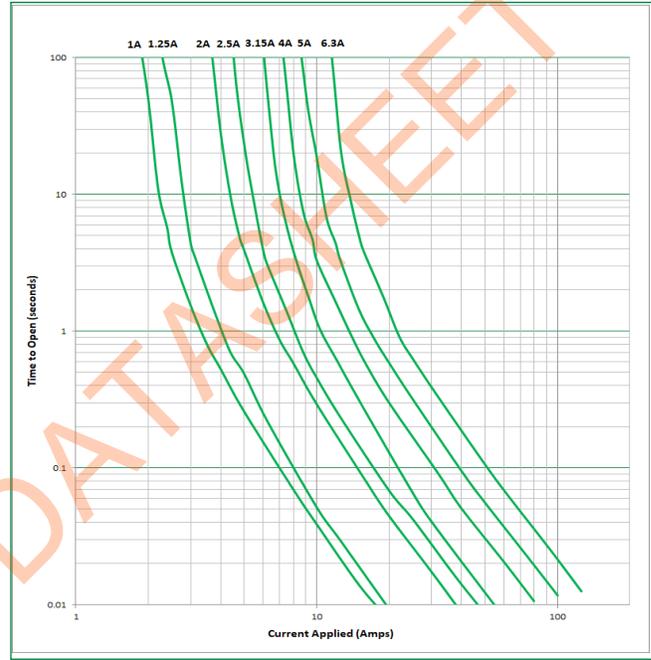
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## Temperature Re-rating Curve



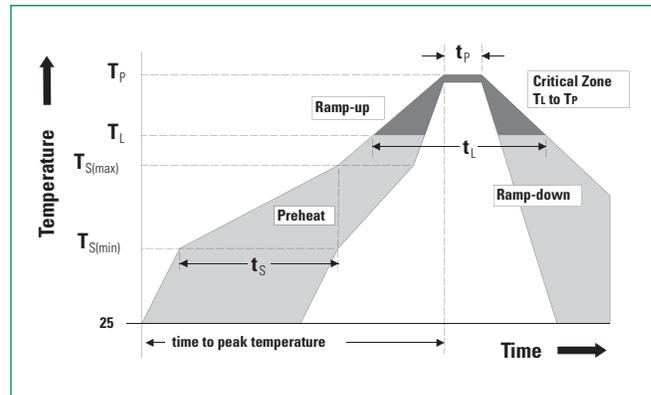
**Note:**  
Rerating depicted in this curve is in addition to the standard derating of 25% for continuous operation.

## Average Time Current Curves



## Soldering Parameters—Reflow Soldering

<b>Reflow Condition</b>		Pb-free assembly
<b>Pre Heat</b>	- Temperature Min ( $T_{s(min)}$ )	150 °C
	- Temperature Max ( $T_{s(max)}$ )	200 °C
	- Time (Min to Max) ( $t_s$ )	60–180 secs
<b>Average ramp up rate (Liquidus Temp (<math>T_L</math>) to peak)</b>		5 °C / second max.
<b><math>T_{s(max)}</math> to <math>T_L</math> - Ramp-up Rate</b>		5 °C / second max.
<b>Reflow</b>	- Temperature ( $T_L$ ) (Liquidus)	217 °C
	- Temperature ( $t_L$ )	60–150 secs
<b>Peak Temperature (<math>T_p</math>)</b>		260+0 / -5 °C
<b>Time within 5 °C of actual peak Temperature (<math>t_p</math>)</b>		20–40 seconds
<b>Ramp-down Rate</b>		5 °C / second max.
<b>Time 25 °C to peak Temperature (<math>T_p</math>)</b>		8 minutes max.
<b>Do not exceed</b>		260 °C



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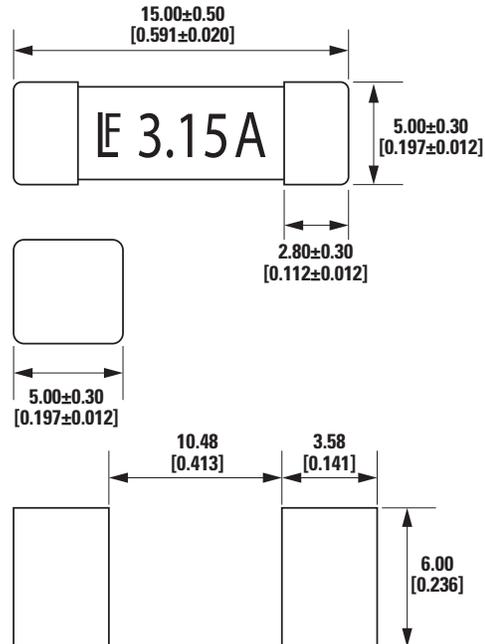
## Product Characteristics

<b>Materials</b>	<b>Body:</b> Ceramic <b>Cap:</b> Silver plated Brass
<b>Product Marking</b>	Body: Brand Logo, Current Rating
<b>Insulation Resistance (after Opening)</b>	MIL-STD-202, Method 302, Test Condition A (10,000 ohms, Minimum)
<b>Solderability</b>	MIL-STD-202, Method 208
<b>Resistance to Solder Heat</b>	JEDEC J-STD-020
<b>Mechanical Shock</b>	MIL-STD-202, Method 213, Test Condition I (100 G's peak for 6 milliseconds)

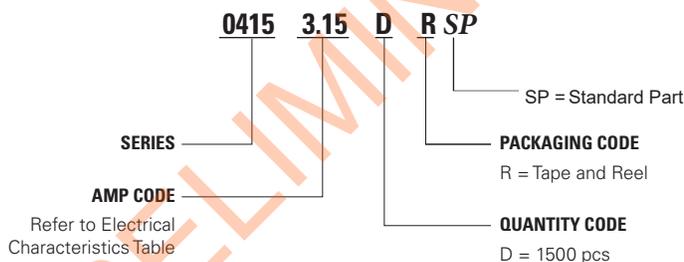
<b>Operating Temperature</b>	-55 °C to 125 °C with proper derating
<b>Thermal Shock</b>	MIL-STD-202, Method 107, Test Condition B (5 cycles -55°C to 125°C)
<b>Vibration Test</b>	MIL-STD-202, Method 201 (10 - 55Hz)
<b>Moisture Sensitivity Level</b>	J-STD-020, Level 1
<b>Moisture Resistance</b>	MIL-STD-202, Method 106, 10 cycles
<b>Salt Spray</b>	MIL-STD-202, Method 101: Test Condition B (48 hrs.)

## Dimensions

All dimensions in mm [in]



## Part Numbering System



## Packaging

Packaging Option	Form Factor	Packaging Specification	Quantity	Quantity and Packaging Code
24mm Tape and Reel	Surface Mount	EIA-RS 481-2 (IEC 60286-3)	1500	DR

## Recommended Pad Layout

**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 <http://www.littelfuse.com/disclaimer-electronics>.