

# 415 Series Surface Mount Fuse

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



## Description

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

## Features and Benefits

- Surface mountable and comes in a small package size of 15mm x 5mm square SMD fuse
- 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
- Recognized to UL/CSA/NMX 248-1 and UL/CSA/NMX 248-14
- Conforms to EN 60127-1 and EN 60127-7
- Small size
- High voltage

## Web Resources



Download ECAD models, order samples, and find technical resources at [www.littelfuse.com](http://www.littelfuse.com)

## Agency Approvals

Agency	Agency File Number	Ampere Range
	E10480	0.160A - 12.5A
	R 50598112	0.160A - 12.5A
	JD 50659959	1A - 12.5A
	N/A	0.160A - 12.5A
	N/A	0.160A - 12.5A

## Application

- Power supplies
- Lighting systems
- Industrial equipment
- White Goods

## Electrical Characteristics

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

## 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				
0.16	.160	277	1500A @ 277VAC 1500A @ 250VDC	9.000	0.055	X	X	X	-	X
1.0	001.	277		0.400	3.6	X	X	X	X	X
1.25	1.25	277		0.267	4.5	X	X	X	X	X
1.6	01.6	277		0.135	4.7	X	X	X	X	X
2.0	002.	277		0.125	12.0	X	X	X	X	X
2.5	02.5	277	1500A @ 277VAC 1500A @ 125VDC	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
8.0	008.	250	1500A @ 250VAC 1500A @ 125VDC	0.010	200.0	X	X	X	X	X
10.0	010.	250	1500A @ 250VAC 1500A @ 125VDC 500A @ 160VDC	0.0076	245.0	X	X	X	X	X
12.5	12.5	250	1000A @ 250VAC 1000A @ 125VDC	0.005	340.0	X	X	X	X	X

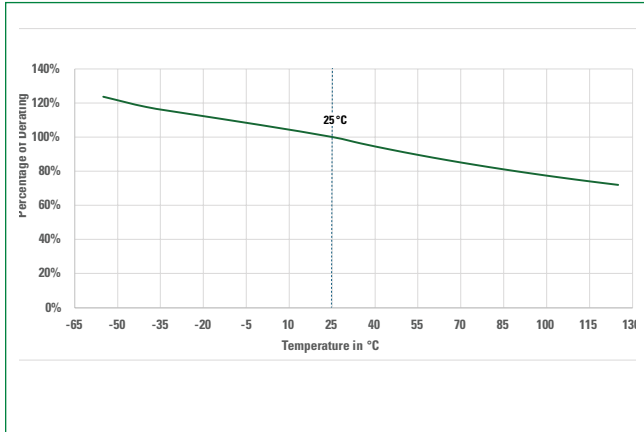
### Notes:

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 to learn more about application specific options

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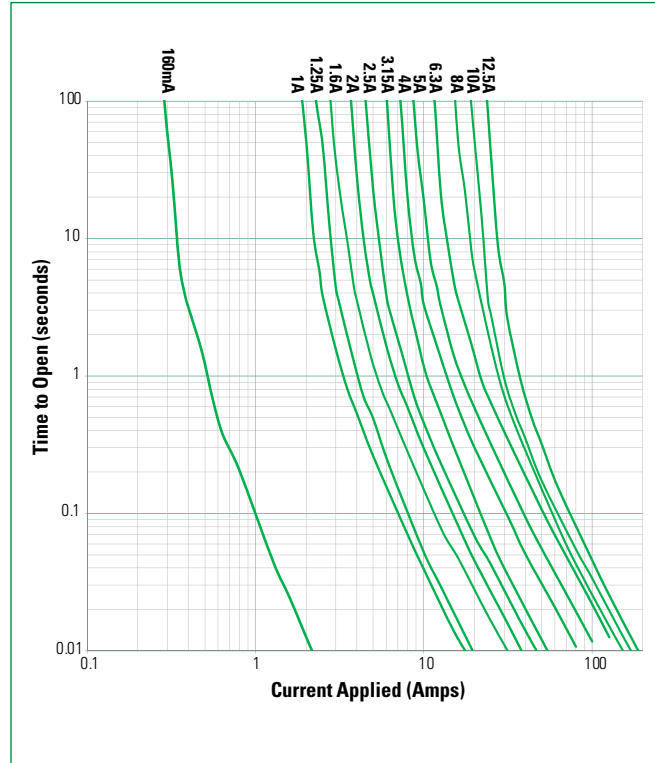
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## Temperature Derating Curve



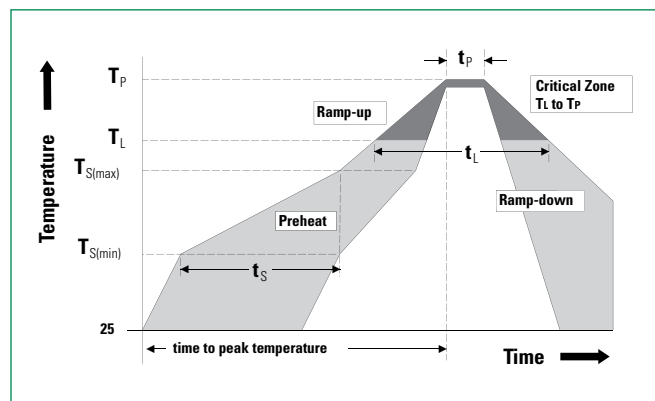
**Note:**  
Derating depicted in this curve is in addition to the standard derating of 25% for continuous operation.

## 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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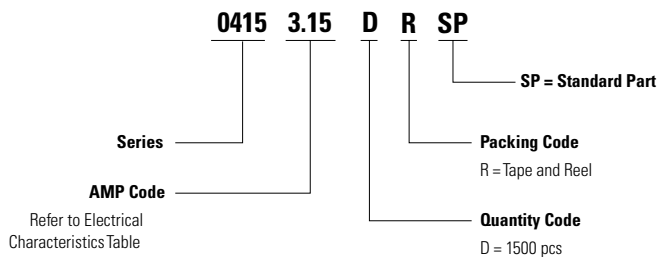
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## Product Characteristics

<b>Materials</b>	<b>Body:</b> Ceramic <b>Cap:</b> Silver plated Copper alloy
<b>Product Marking</b>	Body: Brand Logo, Current Rating
<b>Insulation Resistance (after Opening)</b>	MIL-STD-202, Method 302, Test Condition S (10,000 ohms, Minimum)
<b>Mechanical Shock</b>	MIL-STD-202, Method 213, Test Condition I
<b>Solderability</b>	IPC/EIA/JEDEC J-STD-002D Test Condition B
<b>Resistance to Solder Heat</b>	JEDEC J-STD-020D

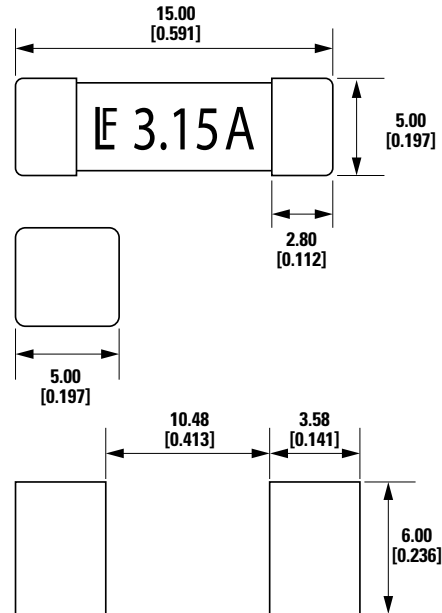
<b>Operating Temperature</b>	-55 °C to 125 °C with proper derating
<b>Thermal Shock</b>	MIL-STD-202, Method 107, Test Condition B (5 cycles -55°C to 125°C)
<b>Vibration Test</b>	MIL-STD-202, Method 204 Test Condition D
<b>Moisture Sensitivity Level</b>	J-STD-020, Level 1
<b>Moisture Resistance</b>	MIL-STD-202 Method 106
<b>Salt Spray</b>	MIL-STD-202, Method 101: Test Condition B

## Part Numbering System



## Dimensions

All dimensions in mm [in]



## Packaging

Packaging Option	Form Factor	Packaging Specification	Quantity	Quantity and Packaging Code
24mm Tape and Reel	Surface Mount	EIA-481	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>.