

# 160 Series Fuse and Clip Assembly

## NANO<sup>2</sup><sup>®</sup>



### Description

The 160 Series product is a metal fuse clip with pre-installed Littelfuse 443 Series Fuse. This fuse and clip combination can be automatically installed in PC Boards in one efficient manufacturing operation. It permits quick and easy fuse replacement without exposing the PC Boards and other components to risks of rework solder heat as required with direct surface mount fuses.

It is designed to enable compliance with the RoHS directive. This product is fully compatible with lead-free solder alloy and higher temperature profiles associated with lead-free assembly.

### Features & Benefits

- Offer low profile easily-replaceable fuse alternative compatible with automated PCB surface mount equipment
- Comes supplied with Littelfuse 443 Series 250V Nano2<sup>®</sup> Fuse
- RoHS compliant and Halogen Free
- Clip fully compatible with RoHS/lead-free solder alloys and higher temperature profiles associated with lead-free assembly
- 0.5A - 5A ampere rating available

### Applications

- AC/DC power adaptor
- Telecom equipment system power
- Portable system built-in AC/DC converter
- High voltage DC/DC converter
- Lighting System
- LED Lighting

### Additional Information



Resources



Accessories



Samples

### Agency Approvals

Agency	Agency File/Certificate Number	Ampere Range
	NBK290416-JP1021	1.00A – 5.00A*
	E14721	0.5A - 5A
	NA	0.5A - 5A
	NA	0.5A - 5A

**Note:** \*PSE/METI Certification is only applicable to the fuse. Clips do not require certification for the Japanese Market.

### Electrical Characteristics for Series

% of Ampere Rating	Opening Time
100%	4 hours, Minimum
250%	120 seconds, Maximum

### Electrical Specifications by Item

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)	Nominal Voltage Drop (mV)	Agency Approvals			
0.50	0.50	250	50 A @ 250 VAC	.5974	1.96	334	x	x	-	x
0.75	0.75	250		.2729	3.025	223	x	x	-	x
1.00	001.	250		.1826	9.00	207	x	x	x	x
1.50	01.5	250		.1100	15.21	210	x	x	x	x
2.00	002.	250		.0511	18.50	117	x	x	x	x
2.50	02.5	250		.0392	22.20	156	x	x	x	x
3.00	003.	250		.0276	59.29	103	x	x	x	x
3.50	03.5	250		.0199	59.34	87	x	x	x	x
4.00	004.	250		.0160	122.5	83	x	x	x	x
5.00	005.	250		.0115	180.6	73	x	x	x	x

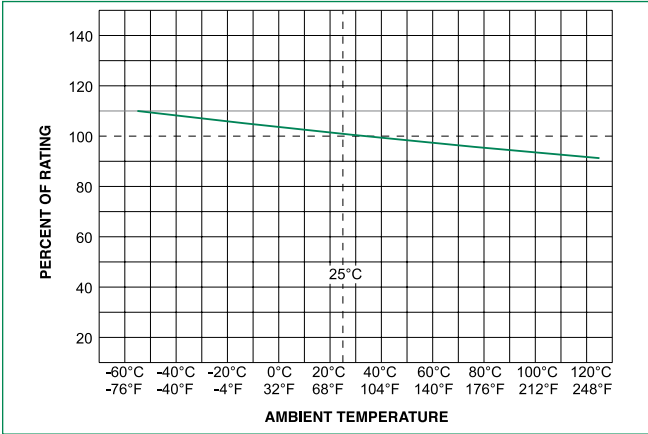
**Notes:**

1. Cold resistance measured at less than 10% of rated current at 23°C.
2. Agency Approval Table Key: X=Approved or Certified, P=Pending.

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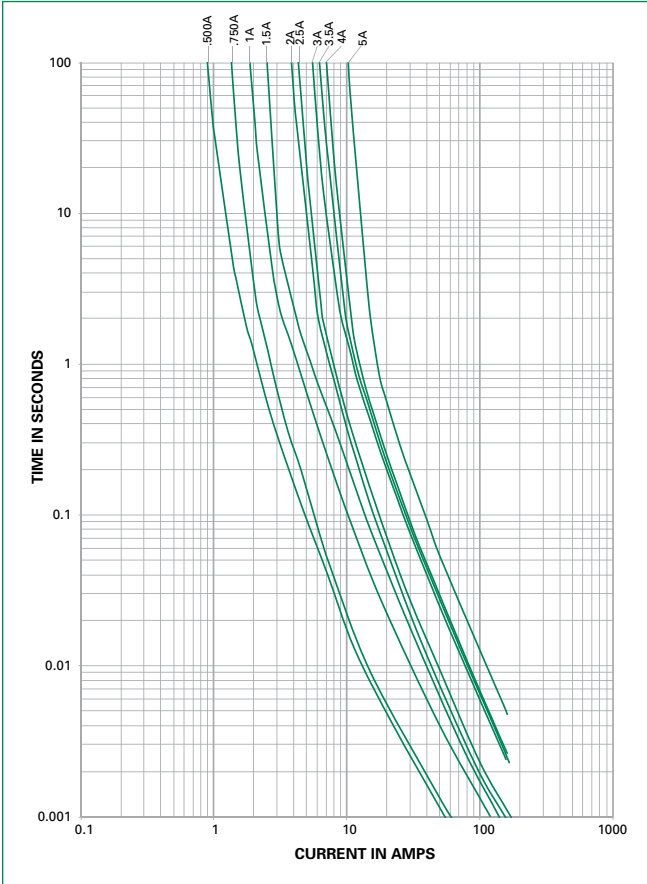
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Temperature Re-rating Curve



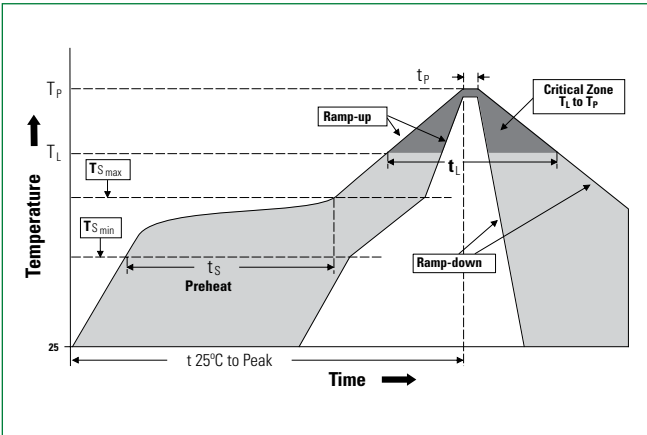
**Note:**  
 1. Rerating depicted in this curve is in addition to the standard derating of 25% for continuous operation.

Average Time Current Curves



Soldering Parameters

<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) ( $t_p$ )	60 – 180 seconds
<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 ( $t_r$ )	60 – 150 seconds
<b>Peak Temperature (<math>T_p</math>)</b>		260 <sup>+0/-5</sup> °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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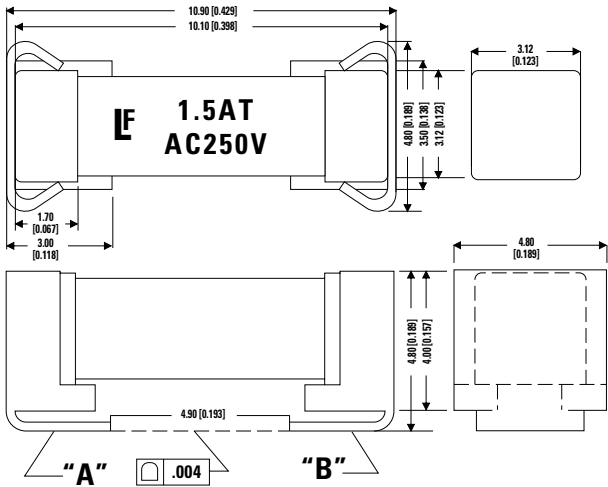
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### Product Characteristics

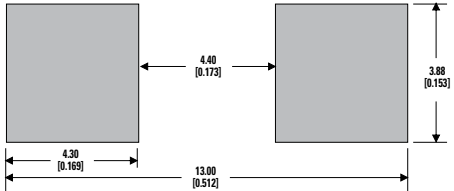
<b>Materials</b>	<b>Body:</b> Ceramic <b>Cap:</b> Silver-plated Brass
<b>Product Marking</b>	Brand, Ampere Rating, Voltage Rating, UMF Logo
<b>Insulation Resistance</b> (after Opening)	MIL-STD-202, Method 302, Test Condition A (10,000 ohms, Minimum)
<b>Solderability</b>	MIL-STD-202, Method 208
<b>Resistance to Soldering Heat</b>	MIL-STD-202, Method 210, Test Condition B (10 seconds at 260°C)
<b>Moisture Sensitivity Level</b>	Level 1 J-STD-020

<b>Operating Temperature</b>	-55°C to 125°C with proper re-rating
<b>Thermal Shock</b>	MIL-STD-202, Method 107, Test Condition B (5 cycles, -65°C to 125°C)
<b>Vibration</b>	MIL-STD-202, Method 201 (10-55 Hz)
<b>Moisture Resistance</b>	MIL-STD-202, Method 106, High Humidity (90-98%RH), Heat (65°C)
<b>Salt Spray</b>	MIL-STD-202, Method 101, Test Condition B
<b>Mechanical Shock</b>	MIL-STD-202, Method 213, Test Condition I (100 G's peak for 6 msec.)

### Dimensions

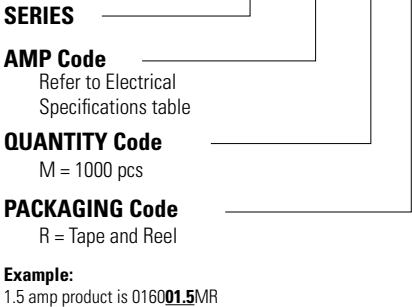


### Recommended Pad Layout



### Part Numbering System

**160 01.5 M R**



### Packaging

Form Factor	Packaging Option	Packaging Specification	Quantity	Quantity & Packaging Code
Surface Mount	24mm Tape and Reel	EIA-RS 481-2 (IEC 286, part 3)	1000	MR

**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).