

### 456SDE Series Fuse



#### Description

The High Current NANO<sup>2</sup>® Fuse is a small square surface mount fuse that is designed to support higher current requirements of various applications.

#### Features

- Available in ratings of 40 A to 60 A
- High interrupting rating of 600 A @ 80 VDC
- Very low cold resistance, temperature rise, and voltage drop
- Surface mountable high current fuse
- UL Recognized UL/CSA/NMX 248-1 and UL/CSA/NMX 248-14


#### Benefits

- Single fuse solution for high current application
- Suitable for a wide variety of voltage requirements and applications
- Enhances power efficiency
- Avoids nuisance opening due to high inrush and surge current inherent in the system
- Compatible with high volume assembly requirements

#### Applications

- Voltage regulator Module for PC Server
- Cooling Fan System for PC Server
- Storage System Power
- Basestation Power Supply
- Power Tools

#### Agency Approvals

Agency	Agency File Number	Ampere Rating
	E10480	40 A –60 A

#### Electrical Characteristics

% of Ampere Rating	Opening Time
100%	4 hours, Minimum
200%	60 seconds, Maximum

#### Additional Information



Datasheet




Resources



Samples

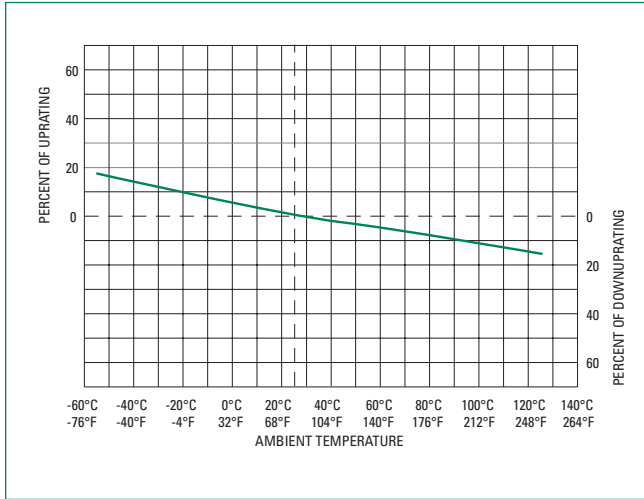
#### Electrical Specifications

Ampere Rating (A)	Amp Code	Max Voltage Rating (V)	Interrupting Rating	Nominal Cold Resistance (Ohms) <sup>1</sup>	Nominal Melting I <sup>2</sup> t (A <sup>2</sup> Sec.) <sup>3</sup>	Nominal Voltage Drop (mV)	Agency Approvals <sup>2</sup>
							
40	040.	250	150A @ 250VAC 600A @ 80VDC	0.00130	1700	110	x
50	050.	250	150A @ 250VAC 600A @ 80VDC	0.00105	2700	115	x
60	060.	250	150A @ 250VAC 600A @ 80VDC	0.00085	4260	106	x

#### Notes:

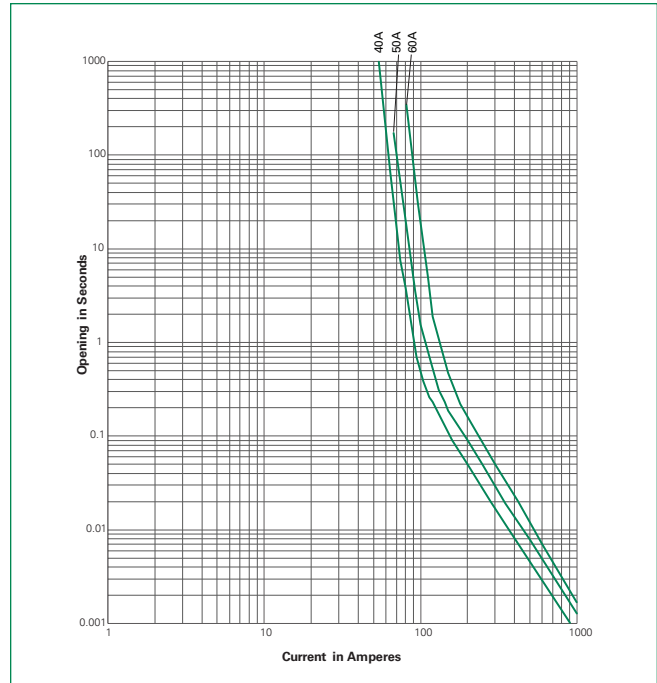
1. Cold resistance measured at less than 10% of rated current at 23° C.
2. Agency Approval Table Key: X = Approved or Certified, P = Pending.
3. I<sup>2</sup>t values stated for 8msec opening time.

**Temperature Re-rating Curve**



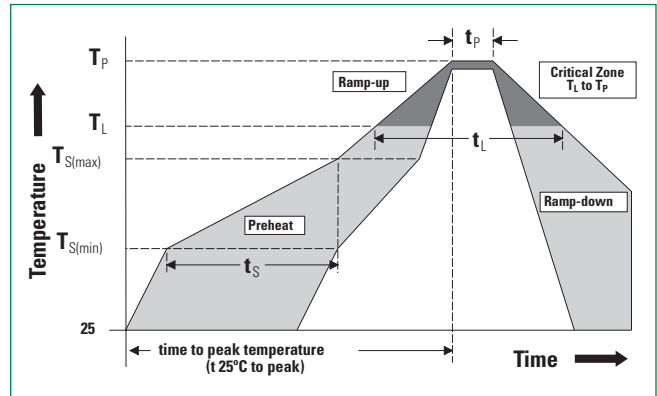
Note:  
1. Rerating depicted in this curve is in addition to the standard derating of 25% for continuous operation.

**Average Time Current Curves**



**Soldering Parameters – 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 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

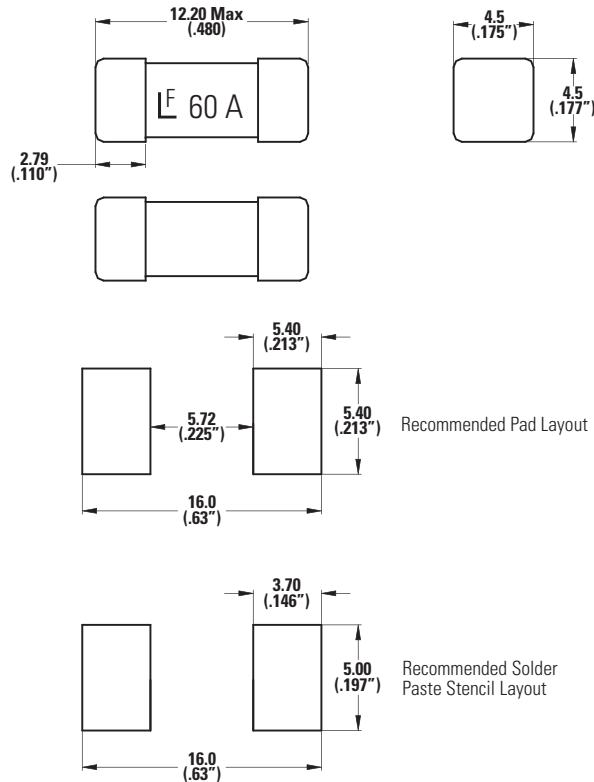


### Product Characteristics

<b>Materials</b>	Body: Ceramic Cap: Silver Plated Brass
<b>Product Marking</b>	Body: Brand Logo, Current Rating
<b>Insulation Resistance</b>	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 sec at 260°C)
<b>PCB Recommendation for Thermal Management</b>	Minimum copper trace width = 15 mm (40 A)/25 mm (50 A/60 A) Recommended copper trace weight = 3oz (40A) / 6oz (50 A/60 A) For PSE requirements: Minimum Copper trace width = 35mm Recommended Copper trace weight = 6oz  Alternate methods of thermal management may be used. In such cases, under normal operations, the maximum temperature of the fuse body should not exceed 90°C in a 25°C environment.

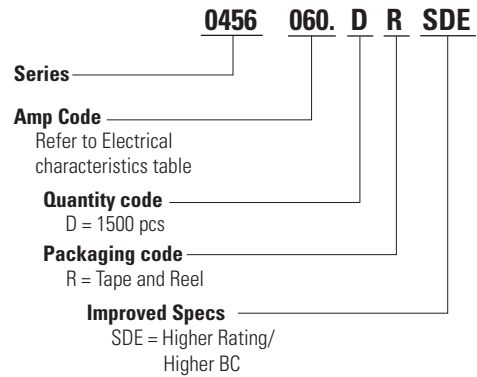
<b>Operating Temperature</b>	-55°C to 125°C with proper derating
<b>Thermal Shock</b>	MIL-STD-202, Method 107, Test Condition B (5 cycles -65°C to 125°C)
<b>Vibration</b>	MIL-STD-202, Method 201 (10-55 Hz)
<b>Moisture Sensitivity Level</b>	J-STD-020, Level 1
<b>Moisture Resistance</b>	MIL-STD-202 Method 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 milliseconds)

### Dimensions



Note: Recommended Stencil Thickness: 0.152 mm  
Dimensions are in millimeters (inches)

### Part Numbering System



### Packaging

Rating	Packaging Option	Packaging Specification	Quantity	Quantity & Packaging Code
40 A-60 A	24 mm Tape and Reel	EIA RS-481-2 (IEC 286, Part 3)	1500	DR

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