

# 456 Series Fuse

## Very Fast Acting 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

- Surface mount high current fuse
- Fully compatible with lead-free solder alloys and higher temperature profiles associated with lead-free assembly
- RoHS compliant and Halogen Free
- Available in ratings of 20 to 40 Amperes
- UL Recognized UL/CSA/NMX 248-1 and UL/CSA/NMX 248-14
- Conforms to IEC/EN 60127-1 and IEC/EN 60127-7
- Conforms to DENAN's Appendix 3

### Additional Information



Resources



Accessories



Samples

### Applications

- Voltage regulator module for PC server
- Cooling fan system for PC server
- Storage system power
- Basestation power supply

### Electrical Characteristics

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

### Agency Approvals

Agency	Agency File/Certificate Number	Ampere Rating
cULus	E10480	20A - 40A
△	J50446929	20A - 40A
PS E	NBK030308-JP1021	20A - 30A
SP	29862	20A - 40A

### Electrical Specifications

Ampere Rating (A)	Amp Code	Max Voltage Rating (V)	Interrupting Rating <sup>4</sup>	Nominal Cold Resistance (Ohms)	Nominal Melting I <sup>2</sup> t (A <sup>2</sup> Sec.)	Nom Voltage Drop (mV)	Agency Approvals			
							cULus	△	PS E	SP
20	020.	125	100A @125VAC 300A @ 65VAC 300A @ 100VDC 1000A @ 32VDC 500A @ 72VDC	0.00230	18	64.7	x	x	x	x
25	025.	125	100A @ 125VAC 300A @ 65VAC 500A @ 72VDC 1000A @ 32VDC	0.00192	45	68.38	x	x	x	x
30	030.	125	100A @ 125VAC 300A @ 65VAC 1000A @ 32VDC 500A @ 72VDC	0.00132	81	69.9	x	x	x	x
40	040.	72	180A @ 72VDC 600A @ 60VDC	0.00105	191	55	x	x	-	x

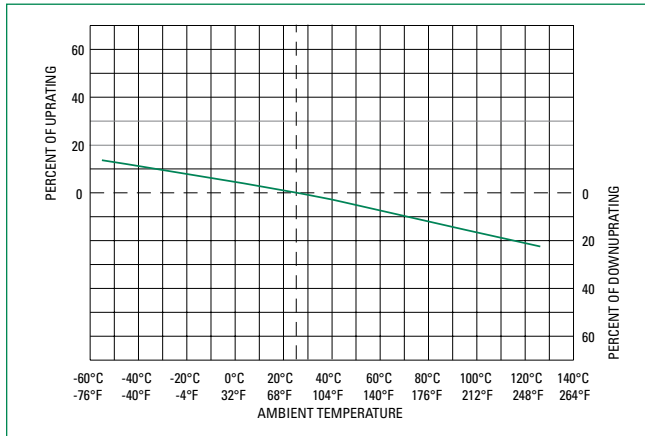
#### Notes:

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.
3. I<sup>2</sup>t values stated for 1 msec opening time.
4. Interrupting Rating may differ based on Agency Approval. See Agency Approval certificate for more details.

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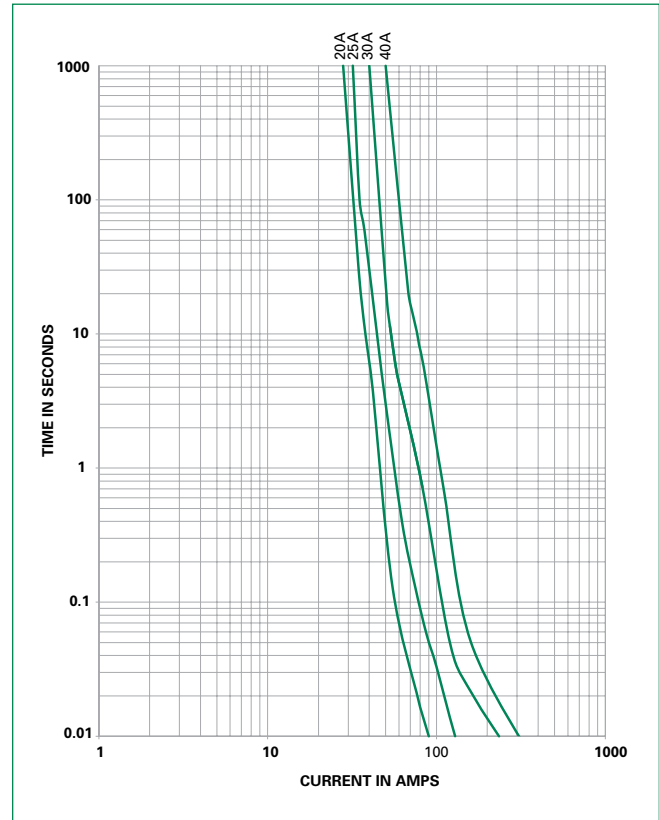
### Temperature Re-rating Curve



#### Note:

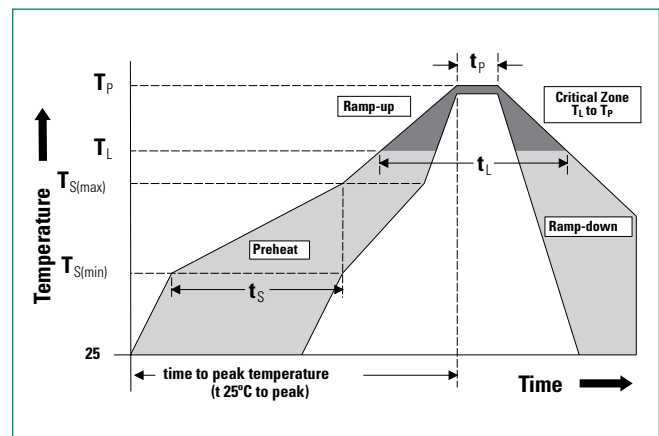
1. Rerating depicted in this curve is in addition to the standard derating of 25% for continuous operation.

### Average Time Current Curves



### Soldering Parameters – 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 $^{+0/-5}$ °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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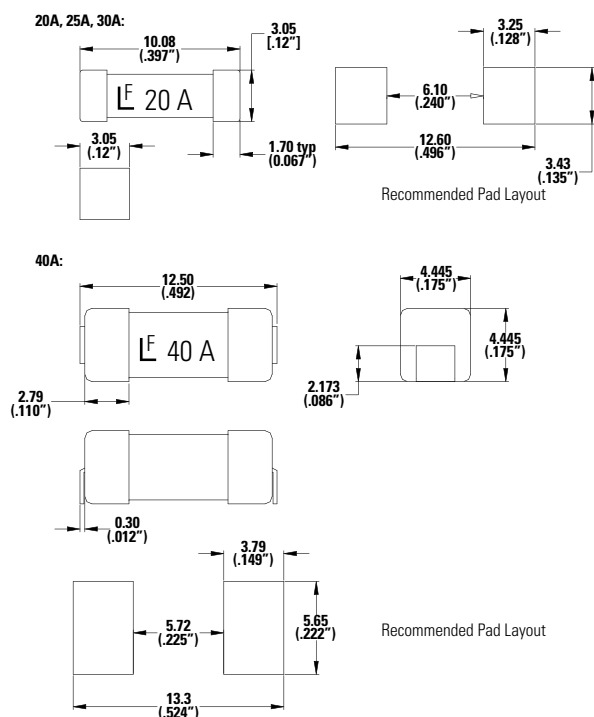
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### Product Characteristics

<b>Materials</b>	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) Min. copper layer thickness = 100µm Min. copper trace width = 20A, 30 10mm (20A, 30A) / 15mm (40A)
<b>PCB Recommendation for Thermal Management</b>	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



### Part Numbering System

	<b>0456</b>	<b>020.</b>	<b>E</b>	<b>R</b>
<b>Series</b>				
<b>Amp Code</b>				
Refer to Electrical characteristics table				
<b>Quantity code</b>				
E = 2500 pcs				
D = 1500 pcs				
<b>Packaging code</b>				
R = Tape and Reel				

### Packaging

Rating	Packaging Option	Packaging Specification	Quantity	Quantity & Packaging Code
20A, 25A, 30A	24 mm Tape and Reel	EIA RS-481-2	2500	ER
40A	24 mm Tape and Reel	EIA RS-481-2 (IEC 286, part 3)	1500	DR

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