

# 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 |
|--------|--------------------------------|---------------|
| c  us  | E10480                         | 20A - 40A     |
|        | J50446929                      | 20A - 40A     |
|        | NBK030308-JP1021               | 20A - 30A     |
|        | 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 |   |   |   |
|-------------------|----------|------------------------|--|--------------------------------|--|-----------------------|------------------|---|---|---|
|                   |          |                        |  |                                |  |                       | c  us            |   |   |   |
| 20                | 020.     | 125                    | 100A @125VAC<br>300A @ 65VAC<br>300A @ 100VDC<br>1000A @ 32VDC<br>500A @ 72VDC | 0.00230                        | 18   | 64.7                  | x                | x | x | x |
| 25                | 025.     | 125                    | 100A @ 125VAC<br>300A @ 65VAC<br>500A @ 72VDC<br>1000A @ 32VDC                 | 0.00192                        | 45   | 68.38                 | x                | x | x | x |
| 30                | 030.     | 125                    | 100A @ 125VAC<br>300A @ 65VAC<br>1000A @ 32VDC<br>500A @ 72VDC                 | 0.00132                        | 81   | 69.9                  | x                | x | x | x |
| 40                | 040.     | 72                     | 180A @ 72VDC<br>600A @ 60VDC   | 0.00105                        | 191  | 55                    | x                | x | - | x |

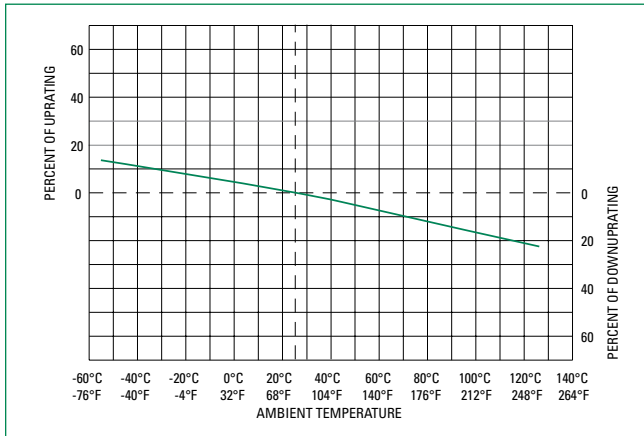
**Notes:**

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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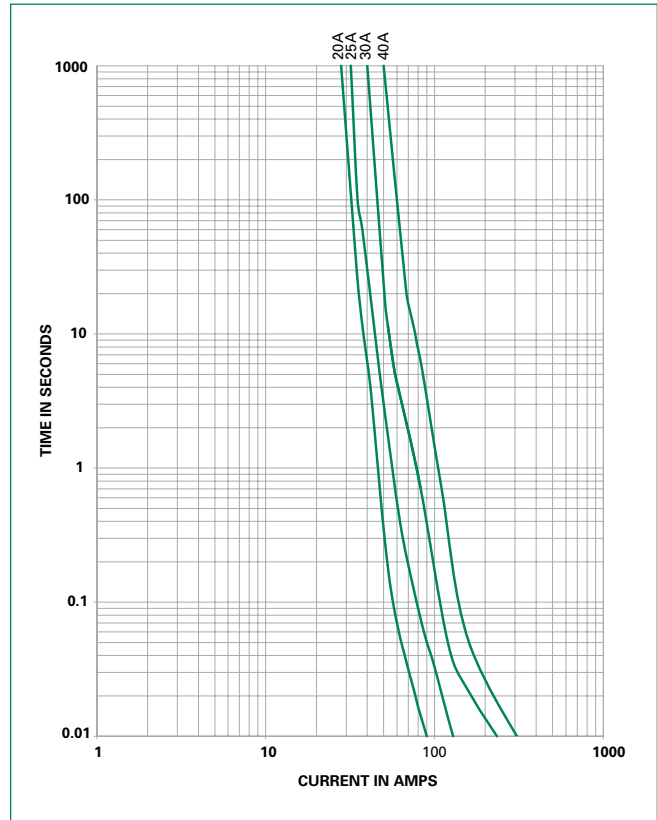
## Very Fast Acting Fuse

Temperature Re-rating Curve



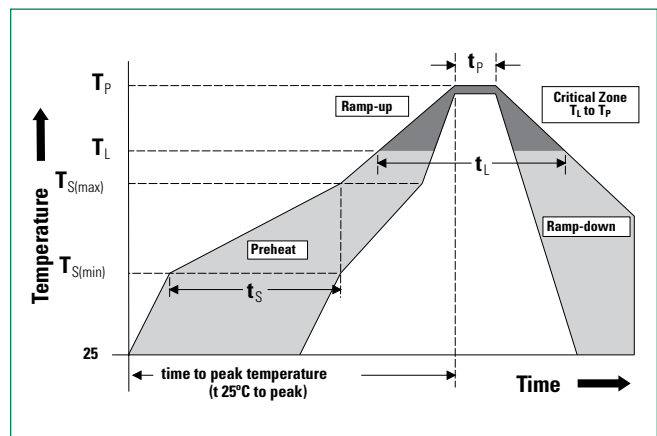
**Note:**  
1. Rerating depicted in this curve is in addition to the standard derating of 25% for continuous operation.

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                   |



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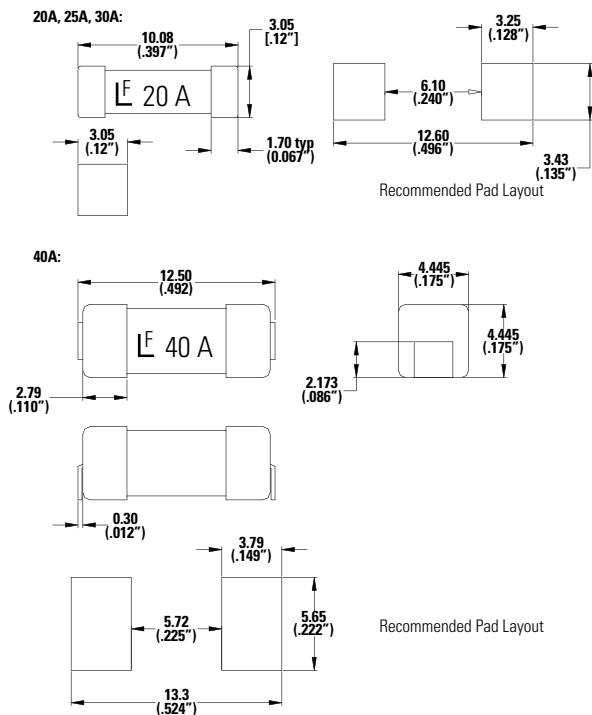
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### Product Characteristics

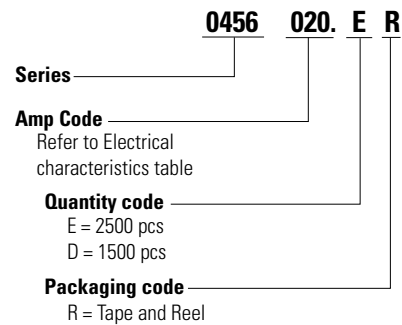
|  |   |
|--|---|
| <b>Materials</b>                                 | Body: Ceramic<br>Cap: Silver Plated Brass   |
| <b>Product Marking</b>                           | Body: Brand Logo, Current Rating  |
| <b>Insulation Resistance</b>                     | MIL-STD-202, method 302, Test Condition A (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)<br>Min. copper layer thickness = 100µm<br>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



### 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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