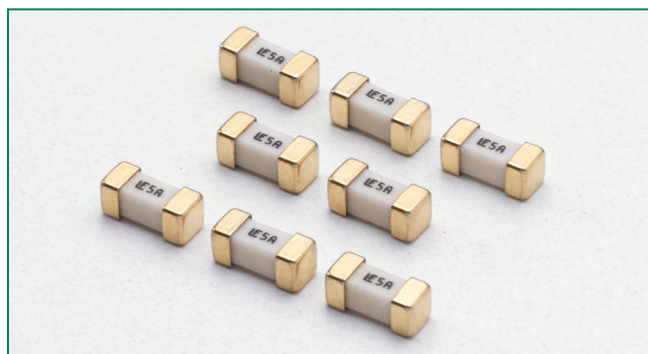


### 449 Series Fuse



#### Agency Approvals

| AGENCY | AGENCY FILE NUMBER | AMPERE RANGE |
|--------|--------------------|--------------|
|        | E10480             | 0.375A - 5A  |
|        | NBK030205-E10480B  | 1A - 5A      |

#### Electrical Characteristics for Series

| % of Ampere Rating | Opening Time                    |
|--------------------|---------------------------------|
| 100%               | 4 hours, Minimum                |
| 200%               | 1 sec., Min.; 60 sec., Max.     |
| 300%               | 0.2 sec., Min.; 3 sec., Max     |
| 800%               | 0.02 sec., Min.; 0.1 sec., Max. |

#### Additional Information



Datasheet



Resources



Samples

#### Description

The lead free NANO<sup>2</sup>® Slo-Blo® fuse is RoHS compliant, Halogen Free and 100% lead-free. This product is fully compatible with lead-free solder alloys and higher temperature profiles associated with lead-free assembly. The Slo-Blo® fuse design has enhanced inrush withstand characteristics over the NANO<sup>2</sup>® Fast-Acting Fuse. The unique time delay feature of this fuse design helps solve the problem of nuisance "opening" by accommodating inrush currents that normally cause a fast-acting fuse to open.

#### Features

- Lead-free and Halogen Free
- Small size
- Wide range of current ratings available
- Wide operating temperature range
- Low temperature derating

#### Applications

Secondary protection for space constrained applications:

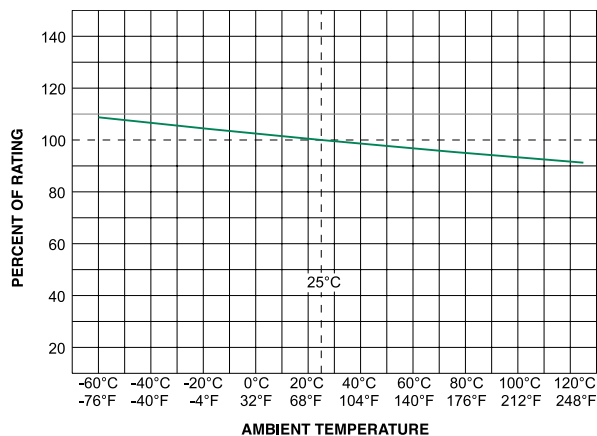
- Notebook PC
- LCD/PDP TV
- LCD monitor
- LCD/PDP panel
- LCD backlight inverter
- Portable DVD player
- Power supply
- Networking
- PC server
- Cooling fan system
- Storage system
- Telecom system
- Wireless basestation
- White goods
- Game console
- Office Automation equipment
- Battery charging circuit protection
- Industrial equipment

#### 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) | Agency Approvals |   |
|-------------------|----------|------------------------|----------------------------------------|--------------------------------|-------------------------------------------------------|------------------|---|
|                   |          |                        |                                        |                                |                                                       |                  |   |
| 0.375             | .375     | 125                    | 50A @125 VAC/VDC<br>PSE: 100A @100 VAC | 1.5130                         | 0.088                                                 | x                |   |
| 0.500             | .500     | 125                    |                                        | 0.7633                         | 0.258                                                 | x                |   |
| 0.750             | .750     | 125                    |                                        | 0.4080                         | 0.847                                                 | x                |   |
| 1.00              | 001.     | 125                    |                                        | 0.2516                         | 1.76                                                  | x                | x |
| 1.50              | 01.5     | 125                    |                                        | 0.1186                         | 4.70                                                  | x                | x |
| 2.00              | 002.     | 125                    |                                        | 0.0708                         | 6.76                                                  | x                | x |
| 2.50              | 02.5     | 125                    |                                        | 0.0400                         | 13.18                                                 | x                | x |
| 3.00              | 003.     | 125                    |                                        | 0.0352                         | 19.55                                                 | x                | x |
| 3.50              | 03.5     | 125                    |                                        | 0.0261                         | 32.70                                                 | x                | x |
| 4.00              | 004.     | 125                    |                                        | 0.0227                         | 40.80                                                 | x                | x |
| 5.00              | 005.     | 125                    |                                        | 0.0171                         | 59.59                                                 | x                | x |

Notes: - I<sup>2</sup>t calculated at 8ms. Resistance is measured at 10% of rated current, 25°C

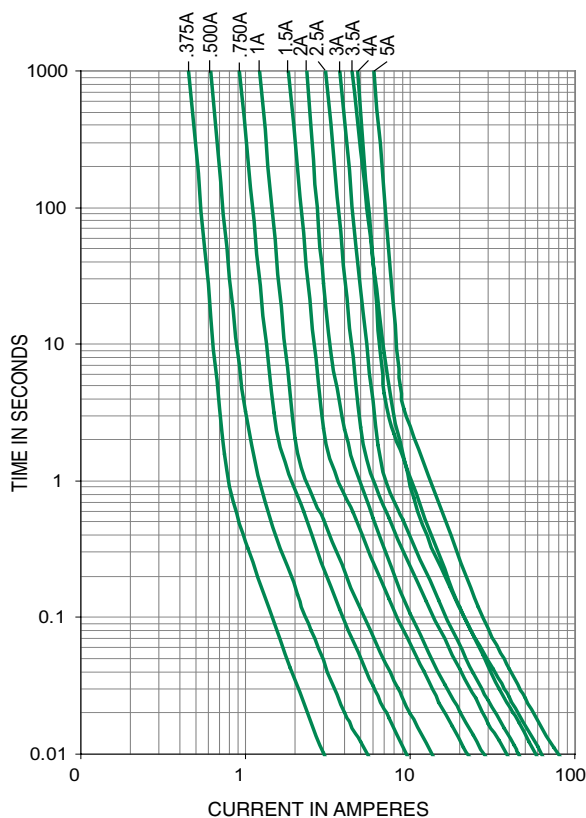
## Temperature Re-rating Curve



Note:

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

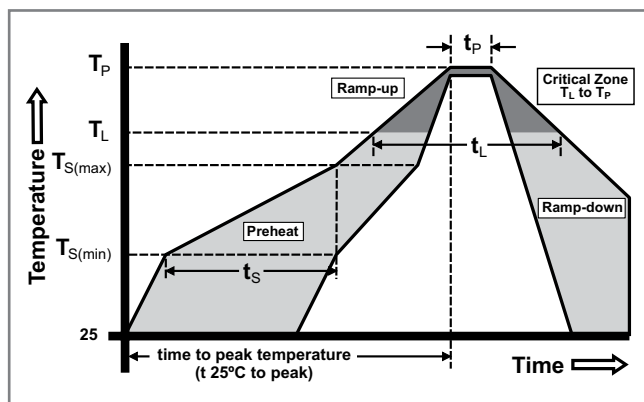
## Average Time Current Curves



## Soldering Parameters

| Reflow Condition                                      |                                    | Pb – Free assembly      |
|-------------------------------------------------------|------------------------------------|-------------------------|
| Pre Heat                                              | - Temperature Min ( $T_{s(min)}$ ) | 150°C                   |
|                                                       | - Temperature Max ( $T_{s(max)}$ ) | 200°C                   |
|                                                       | - Time (Min to Max) ( $t_s$ )      | 60 – 120 secs           |
| Average ramp up rate (Liquidus Temp ( $T_L$ ) to peak |                                    | 3°C/second max.         |
| $T_{s(max)}$ to $T_L$ - Ramp-up Rate                  |                                    | 3°C/second max.         |
| Reflow                                                | - Temperature ( $T_L$ ) (Liquidus) | 217°C                   |
|                                                       | - Temperature ( $t_L$ )            | 60 – 90 seconds         |
| Peak Temperature ( $T_p$ )                            |                                    | 260 <sup>+0/-5</sup> °C |
| Time within 5°C of actual peak Temperature ( $t_p$ )  |                                    | 20 – 40 seconds         |
| Ramp-down Rate                                        |                                    | 5°C/second max.         |
| Time 25°C to peak Temperature ( $T_p$ )               |                                    | 8 minutes max.          |
| Do not exceed                                         |                                    | 260°C                   |

|                           |                                        |
|---------------------------|----------------------------------------|
| Wave Soldering Parameters | 260°C Peak Temperature, 3 seconds max. |
|---------------------------|----------------------------------------|

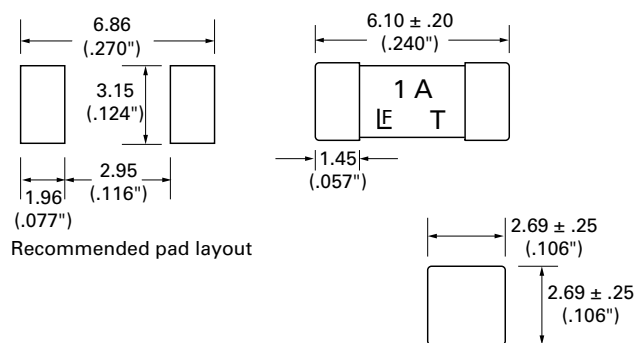


### Product Characteristics

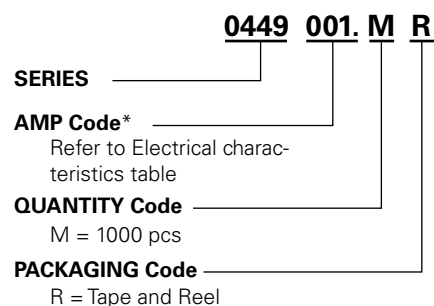
|                                              |                                                                 |
|----------------------------------------------|-----------------------------------------------------------------|
| <b>Materials</b>                             | <b>Body:</b> Ceramic<br><b>Terminations:</b> Gold-plated Caps   |
| <b>Product Marking</b>                       | Brand, Amperage Rating                                          |
| <b>Operating Temperature</b>                 | -55°C to 125°C                                                  |
| <b>Moisture Sensitivity Level</b>            | Level 1, J-STD-020                                              |
| <b>Solderability</b>                         | MIL-STD-202, Method 208                                         |
| <b>Insulation Resistance (after Opening)</b> | MIL-STD-202, Method 302, Test Condition A (10,000 ohms minimum) |

|                                     |                                                                                                                             |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| <b>Thermal Shock</b>                | MIL-STD-202, Method 107, Test Condition B, 5 cycles, -65°C to 125°C, 15 minutes @ each extreme                              |
| <b>Mechanical Shock</b>             | MIL-STD-202, Method 213, Test I: Deenergized. 100G's pk amplitude, sawtooth wave 6ms duration, 3 cycles XYZ+xyz = 18 shocks |
| <b>Vibration</b>                    | MIL-STD-202, Method 201: 0.03" amplitude, 10-55 Hz in 1 min. 2hrs each XYZ=6hrs                                             |
| <b>Moisture Resistance</b>          | MIL-STD-202, Method 106, 10 cycles                                                                                          |
| <b>Salt Spray</b>                   | MIL-STD-202, Method 101, Test Condition B (48hrs)                                                                           |
| <b>Resistance to Soldering Heat</b> | MIL-STD-202, Method 210, Test condition B (10 sec at 260°C)                                                                 |

### Dimensions



### Part Numbering System



**\*Example:**  
0.375 Amp product is 0449.375MR  
(1 amp product shown above).

### Packaging

| Packaging Option   | Packaging Specification        | Quantity | Quantity & Packaging Code |
|--------------------|--------------------------------|----------|---------------------------|
| 12mm Tape and Reel | EIA RS-481-2 (IEC 286, part 3) | 1000     | MR                        |