




### RoHS 452/454 Series Fuse



#### Agency Approvals

| AGENCY  | AGENCY FILE NUMBER | AMPERE RANGE |
|---|--------------------|--------------|
|  | E10480             | 375MA - 5A   |
|  | LR29862            | 375MA - 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. |

#### Description

The NANO<sup>2</sup> Slo-Blo® fuse 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

- Time-Lag (Slo-Blo)
- Small size
- Wide range of current rating available (62mA to 5A)
- Wide operating temperature range
- Low temperature de-rating
- RoHS compliant
- Halogen Free

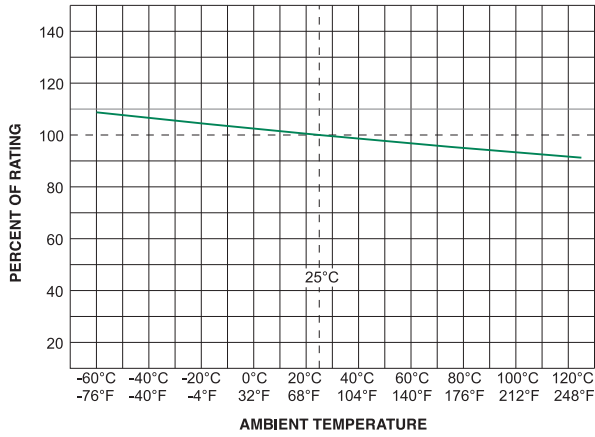
#### Applications

- 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
- Medical equipment
- Automotive

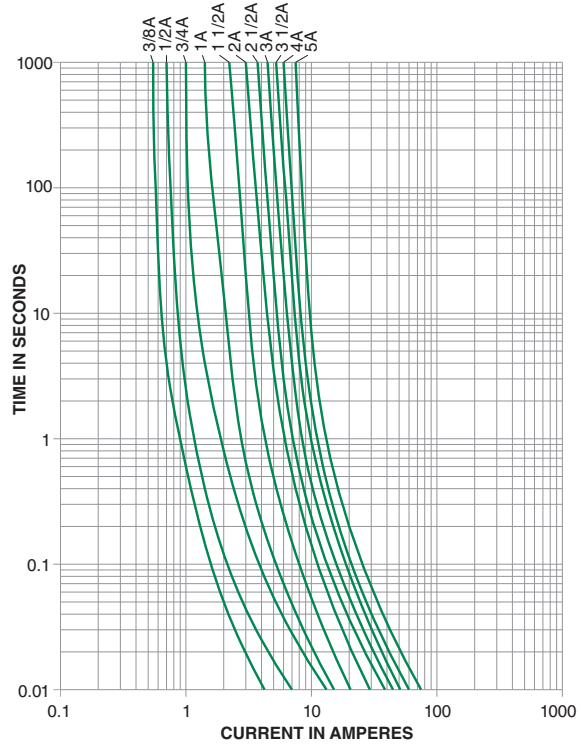
#### Electrical Specifications by Item

| 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                    | 50 amperes @125 VAC/VDC | 1.2000                         | 0.101   | x   | x   |   |
| 0.500             | .500     | 125                    |                         | 0.7000                         | 0.240   | x   | x   |   |
| 0.750             | .750     | 125                    |                         | 0.3600                         | 0.904   | x   | x   |   |
| 001.              | 001.     | 125                    |                         | 0.2250                         | 1.98  | x   | x   | x   |
| 1.50              | 01.5     | 125                    |                         | 0.0930                         | 3.65  | x   | x   | x   |
| 2.00              | 002.     | 125                    |                         | 0.0625                         | 8.20  | x   | x   | x   |
| 2.50              | 02.5     | 125                    |                         | 0.0450                         | 15.0  | x   | x   | x   |
| 3.00              | 003.     | 125                    |                         | 0.0340                         | 20.16   | x   | x   | x   |
| 3.50              | 03.5     | 125                    |                         | 0.0224                         | 26.53   | x   | x   | x   |
| 4.00              | 004.     | 125                    |                         | 0.0186                         | 34.40   | x   | x   | x   |
| 5.00              | 005.     | 125                    |                         | 0.0136                         | 53.72   | x   | x   | x   |

### Temperature Derating Curve

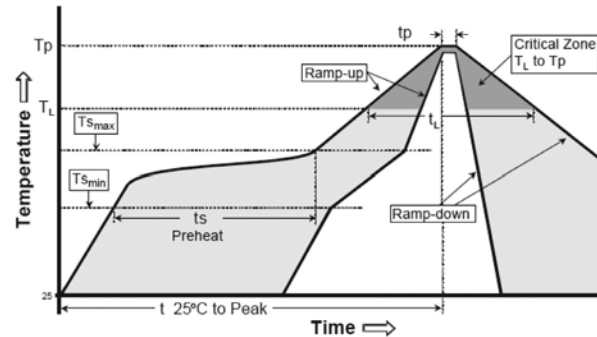


### Average Time Current Curves



### 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 |                                    | 5°C/second max                        |
| $T_{s(max)}$ to $T_L$ - Ramp-up Rate                  |                                    | 5°C/second max                        |
| Reflow  | - Temperature ( $T_L$ ) (Liquidus) | 217°C                                 |
|   | - Temperature ( $t_L$ )            | 60 – 90 seconds                       |
| Peak Temperature ( $T_p$ )                            |                                    | 250 <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 |

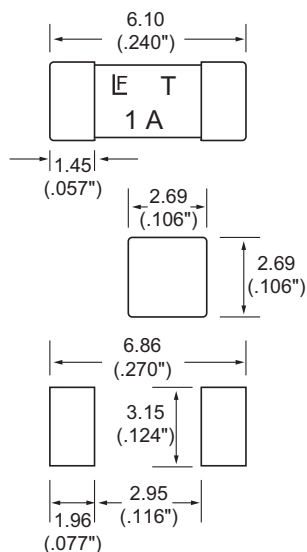


### Product Characteristics

|  |  |
|--|--|
| <b>Materials</b>                             | Body: Ceramic<br>Terminations: Gold-plated Caps (452) / Silver-plated Caps (454) |
| <b>Product Marking</b>                       | Brand, Ampere Rating   |
| <b>Operating Temperature</b>                 | -55°C to 125°C   |
| <b>Moisture Sensitivity Level</b>            | Level 1, J-STD-020C  |
| <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)                  |

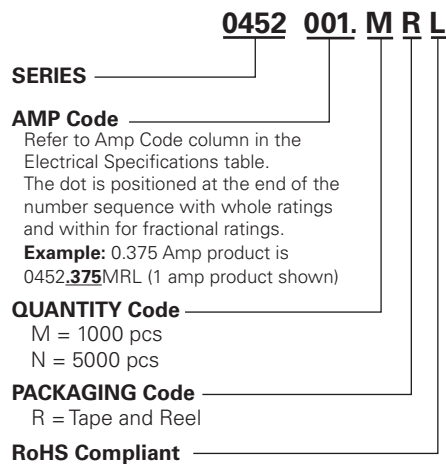
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|-------------------------------------|--|
| <b>Thermal Shock</b>                | MIL-STD-202, Method 107, Test Condition B, 5 cycles, -65°C / +125°C, 15 minutes @ each extreme                             |
| <b>Mechanical Shock</b>             | MIL-STD-202, Method 213, Test I: Deenergized. 100gn 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



Recommended pad layout

### Part Numbering System



### Packaging

| Packaging Option   | Packaging Specification        | Quantity | Quantity & Packaging Code |
|--------------------|--------------------------------|----------|---------------------------|
| 12mm Tape and Reel | EIA RS-481-1 (IEC 286, part 3) | 5000     | NR                        |
| 12mm Tape and Reel | EIA RS-481-1 (IEC 286, part 3) | 1000     | MR                        |