

### 224/225 Series Lead-Free 2AG, Fast-Acting



#### Description

The 2AG Fast-Acting Fuses are available in cartridge form or with axial leads. 2AG Fuses provide the same performance characteristics as their 3AG counterpart, while occupying one-third the space. Sleeved fuses are available.

#### Features

- In accordance with Underwriter's Laboratories Standard UL 248-14
- Available in cartridge and axial lead form and with various forming dimensions
- RoHS compliant and Lead-free

#### Applications

Used as supplementary protection in appliance or utilization equipment to provide individual protection for components or internal circuits.

#### Electrical Characteristics for Series

| % of Ampere Rating | Opening Time     |
|--------------------|------------------|
| 100%               | 4 hours, Minimum |
| 135%               | 1 hour, Maximum  |
| 200%               | 1 sec., Maximum  |

#### Agency Approvals

| Agency | Agency File Number                                                    | Ampere Range                     |
|--------|-----------------------------------------------------------------------|----------------------------------|
|        | E10480                                                                | 0.375A - 3.5A                    |
|        | E10480                                                                | 4A - 10A                         |
|        | 29862                                                                 | 0.375A - 10A                     |
|        | NBK200405-E10480A/B/C/D<br>NBK110512-E10480A/B<br>NBK210405-E10480E/F | 1A - 3.5A<br>4A - 5A<br>6A - 10A |
|        | N/A                                                                   | 0.375A - 10A                     |

#### Additional Information



**Datasheet  
224 Series**



**Resources  
224 Series**



**Samples  
224 Series**



**Datasheet  
225 Series**



**Resources  
225 Series**



**Samples  
225 Series**



**Accessories  
224 & 225 Series**

For recommended fuse accessories for this product series, see ['Recommended Accessories'](#) section.

#### Electrical Characteristic Specifications by Item

| Amp Code | Ampere Rating (A) | Voltage Rating (V) | Interrupting Rating                       | Nominal Cold Resistance (Ohms) | Nominal Melting I <sup>2</sup> t (A <sup>2</sup> sec) | Agency Approvals |   |   |   |   |
|----------|-------------------|--------------------|-------------------------------------------|--------------------------------|-------------------------------------------------------|------------------|---|---|---|---|
|          |                   |                    |                                           |                                |                                                       |                  |   |   |   |   |
| .375     | 0.375             | 250                | 35A@250Vac<br>10KA@125Vac<br>10KA@125Vdc  | 0.3950                         | 0.171                                                 | x                |   | x |   | x |
| .500     | 0.5               | 250                |                                           | 0.2650                         | 0.365                                                 | x                |   | x |   | x |
| .750     | 0.75              | 250                |                                           | 0.1520                         | 1.050                                                 | x                |   | x |   | x |
| .001     | 1                 | 250                |                                           | 0.1027                         | 2.220                                                 | x                |   | x | x | x |
| 01.5     | 1.5               | 250                | 100A@250Vac<br>10KA@125Vac<br>10KA@125Vdc | 0.0712                         | 0.800                                                 | x                |   | x | x | x |
| 002.     | 2                 | 250                |                                           | 0.0497                         | 2.180                                                 | x                |   | x | x | x |
| 02.5     | 2.5               | 250                |                                           | 0.0372                         | 3.820                                                 | x                |   | x | x | x |
| 003.     | 3                 | 250                |                                           | 0.0317                         | 4.620                                                 | x                |   | x | x | x |
| 03.5     | 3.5               | 250                | 100A@250Vac<br>500A@125Vac                | 0.0265                         | 6.700                                                 | x                |   | x | x | x |
| 004.     | 4                 | 125                |                                           | 0.0240                         | 9.400                                                 |                  | x | x | x | x |
| 005.     | 5                 | 125                |                                           | 0.0186                         | 17.0                                                  |                  | x | x | x | x |
| 005.     | 5                 | 250                |                                           | 0.0186                         | 17.0                                                  |                  | x | x |   | x |
| 006.     | 6                 | 125                | 500A@125Vac                               | 0.0154                         | 22.1                                                  |                  | x | x | x | x |
| 007.     | 7                 | 125                |                                           | 0.0130                         | 40.0                                                  |                  | x | x | x | x |
| 008.     | 8                 | 125                |                                           | 0.0107                         | 56.0                                                  |                  | x | x | x | x |
| 010.     | 10                | 125                |                                           | 0.0075                         | 116.0                                                 |                  | x | x | x | x |

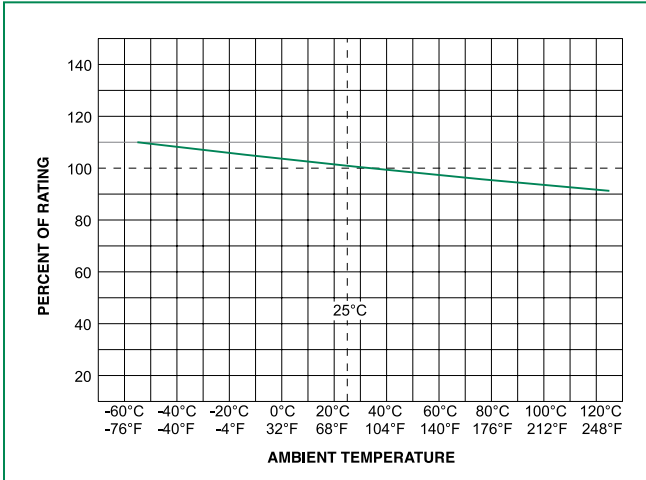
\* 10A with 500A @ 125 Vdc internal breaking capacity testing.

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Specifications are subject to change without notice. Application testing is strongly recommended.

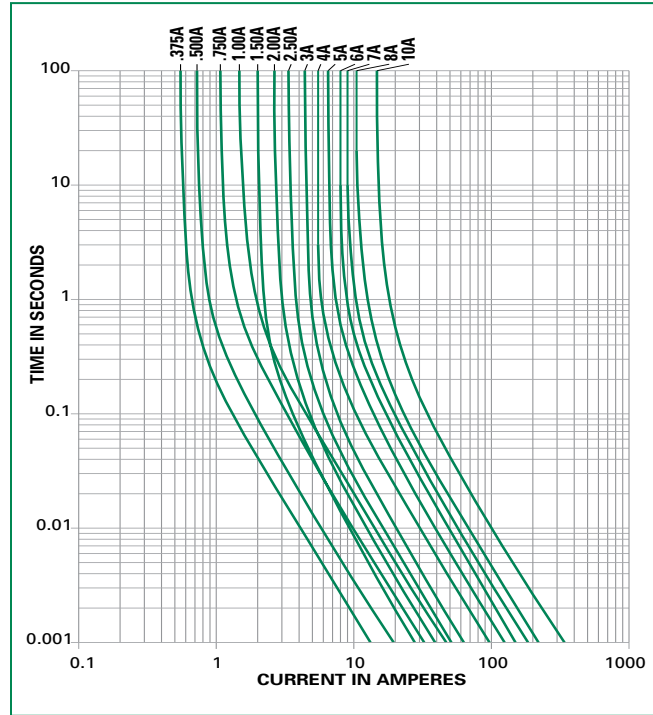
Revised: 02/07/19

### Temperature Re-rating Curve

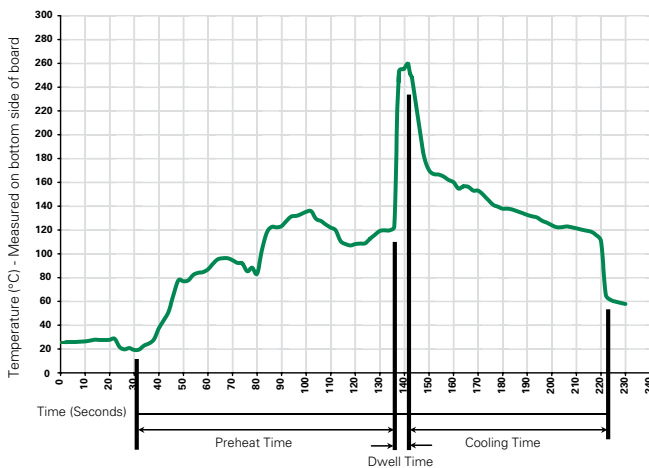


Note:  
Rerating depicted in this curve is in addition to the standard derating of 25% for continuous operation.

### Average Time Current Curves



### Soldering Parameters - Wave Soldering



### Recommended Process Parameters:

| Wave Parameter                           | Lead-Free Recommendation          |
|------------------------------------------|-----------------------------------|
| <b>Preheat:</b>                          |                                   |
| (Depends on Flux Activation Temperature) | (Typical Industry Recommendation) |
| Temperature Minimum:                     | 100°C                             |
| Temperature Maximum:                     | 150°C                             |
| Preheat Time:                            | 60-180 seconds                    |
| <b>Solder Pot Temperature:</b>           | 260°C Maximum                     |
| <b>Solder Dwell Time:</b>                | 2-5 seconds                       |

### Recommended Hand-Solder Parameters:

Solder Iron Temperature: 350°C +/- 5°C  
Heating Time: 5 seconds max.

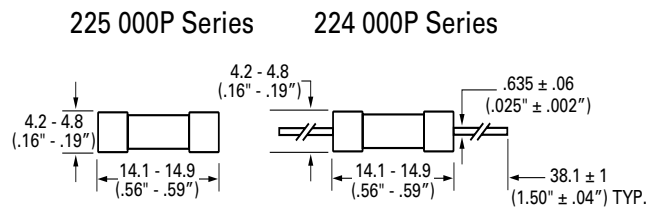
**Note: These devices are not recommended for IR or Convection Reflow process.**

### Product Characteristics

|                          |                                                                                           |
|--------------------------|-------------------------------------------------------------------------------------------|
| <b>Materials</b>         | Body : Glass<br>Cap : Nickel-plated brass<br>Leads: Tin-plated Copper                     |
| <b>Terminal Strength</b> | MIL-STD-202, Method 211, Test Condition A                                                 |
| <b>Solderability</b>     | MIL-STD-202 Method 208                                                                    |
| <b>Product Marking</b>   | Cap1 : Brand logo, current and voltage ratings<br>Cap2 : Series and agency approval marks |

|                               |                                                                                                 |
|-------------------------------|-------------------------------------------------------------------------------------------------|
| <b>Operating Temperature:</b> | -55°C to 125°C.                                                                                 |
| <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                                                                         |
| <b>Humidity</b>               | MIL-STD-202, Method 103, Test Condition A: High RH (95%) and elevated temp (40°C) for 240 hours |
| <b>Salt Spray</b>             | MIL-STD-202, Method 101, Test Condition B                                                       |

### Dimensions



### Part Numbering System

**0224 xxxx M X P**

**Series**  
0229 = Cartridge  
0230 = Axial Leaded

**Amp Code**  
Refer to Amp Code column of Electrical Characteristics Table

**Quantity Code**  
M = 1000

**Packaging Code**  
X = Filler

**Lead-free**

**Note: The ratings from 4A to 10A with MXUP in the suffix**

### Packaging

| Packaging Option  | Packaging Specification | Quantity | Quantity & Packaging Code | Taping Width     |
|-------------------|-------------------------|----------|---------------------------|------------------|
| <b>224 Series</b> |                         |          |                           |                  |
| Bulk              | N/A                     | 1000     | MX                        | N/A              |
| Bulk              | N/A                     | 100      | HX                        | N/A              |
| Reel and Tape     | EIA 296-E               | 1500     | DRT1                      | T1=53mm (2.087") |
| <b>225 Series</b> |                         |          |                           |                  |
| Bulk              | N/A                     | 1000     | MX                        | N/A              |
| Bulk              | N/A                     | 100      | HX                        | N/A              |

### Recommended Accessories

| Accessory Type | Series | Description                                | Max Application Voltage | Max Application Amperage |
|----------------|--------|--------------------------------------------|-------------------------|--------------------------|
| Holder         | 245    | Panel Mount Shock-Safe Fuseholder          | 300                     | 10                       |
|                | 150    | In-Line Fuseholder                         | 350                     | 10                       |
|                | 286    | Panel Mount Flip-Top Shock-Safe Fuseholder | 250                     | 10                       |
| Block          | 254    | OMNI-BLOK® Fuse Block                      | 400                     | 10                       |
| Clip           | 111    | PC Board Mount Fuse Clip                   | 250                     | 10                       |

Notes:  
1. Do not use in applications above rating.  
2. Please refer to fuseholder data sheet for specific re-rating information.  
3. Please contact factory for applications greater than the max voltage and amperage shown.

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