

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



### Agency Approvals

| Agency                                                                              | Agency File Number                   | Ampere Range                             |
|-------------------------------------------------------------------------------------|--------------------------------------|------------------------------------------|
|    | E10480                               | 100mA - 3.5A                             |
|    | E10480                               | 4A - 10A                                 |
|    | LR 29862                             | 100mA - 10A                              |
|   | NBK200405-E10480<br>NBK060405-E10480 | Cartridge: 1A - 10A<br>Pigtail: 1A - 10A |
|  |                                      | 100mA - 10A                              |

### 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

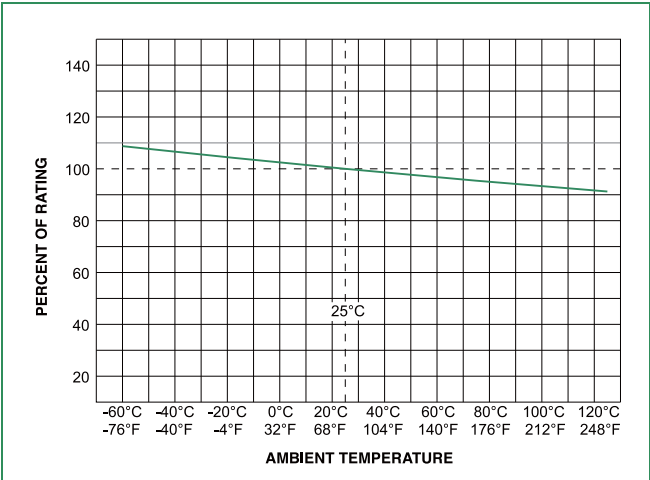
| % of Ampere Rating | Opening Time     |
|--------------------|------------------|
| 100%               | 4 hours, Minimum |
| 135%               | 1 hour, Maximum  |
| 200%               | 1 sec., Maximum  |

### Electrical Characteristic Specifications by Item

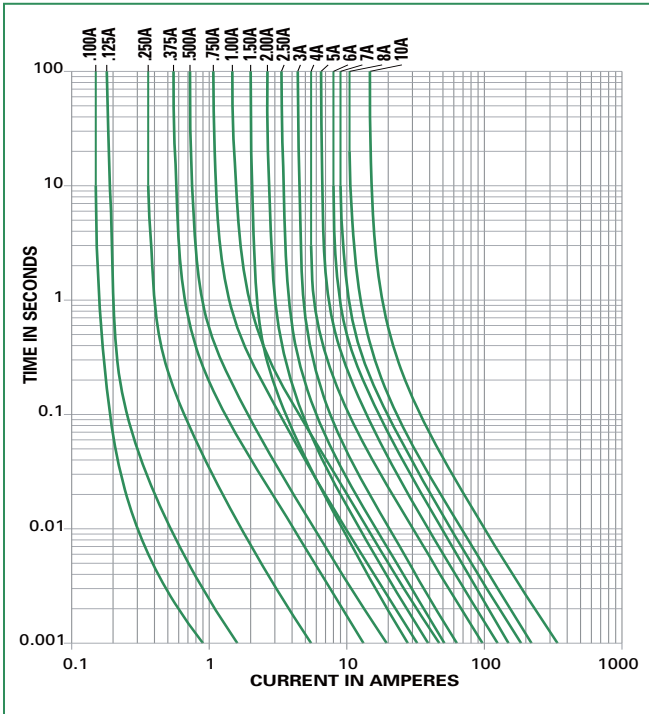
| Amp Code | Ampere Rating (A) | Voltage Rating (V) | Interrupting Rating                       | Nominal Cold Resistance (Ohms) | Nominal Melting I <sup>2</sup> t (A <sup>2</sup> sec) | Agency Approvals                                                                     |                                                                                       |                                                                                       |                                                                                       |                                                                                       |
|----------|-------------------|--------------------|-------------------------------------------|--------------------------------|-------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|          |                   |                    |                                           |                                |                                                       |  |  |  |  |  |
| .100     | .1                | 250                | 35A@250Vac<br>10KA@125Vac<br>10KA@125Vdc  | 6.1500                         | 0.00075                                               | x                                                                                    |                                                                                       | x                                                                                     |                                                                                       | x                                                                                     |
| .125     | 0.125             | 250                |                                           | 3.9000                         | 0.00286                                               | x                                                                                    |                                                                                       | x                                                                                     |                                                                                       | x                                                                                     |
| .250     | 0.25              | 250                |                                           | 1.1500                         | 0.0300                                                | x                                                                                    |                                                                                       | x                                                                                     |                                                                                       | x                                                                                     |
| .375     | 0.375             | 250                |                                           | 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                         | 1.500                                                 | x                                                                                    |                                                                                       | x                                                                                     | x                                                                                     | x                                                                                     |
| 02.5     | 2.5               | 250                |                                           | 0.0372                         | 2.680                                                 | x                                                                                    |                                                                                       | x                                                                                     | x                                                                                     | x                                                                                     |
| 003.     | 3                 | 250                |                                           | 0.0317                         | 4.620                                                 | x                                                                                    |                                                                                       | x                                                                                     | x                                                                                     | x                                                                                     |
| 03.5     | 3.5               | 250                |                                           | 0.0265                         | 6.700                                                 | x                                                                                    |                                                                                       | x                                                                                     | x                                                                                     | x                                                                                     |
| 004.     | 4                 | 125                | 100A@250Vac<br>500A@125Vac                | 0.0240                         | 9.400                                                 |                                                                                      | x                                                                                     | x                                                                                     | x                                                                                     | x                                                                                     |
| 005.     | 5                 | 125                |                                           | 0.0186                         | 17.0                                                  |                                                                                      | x                                                                                     | x                                                                                     | x                                                                                     | x                                                                                     |
| 005.     | 5                 | 250                | 500A@125Vac                               | 0.0186                         | 17.0                                                  |                                                                                      | x                                                                                     | x                                                                                     |                                                                                       | x                                                                                     |
| 006.     | 6                 | 125                |                                           | 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.

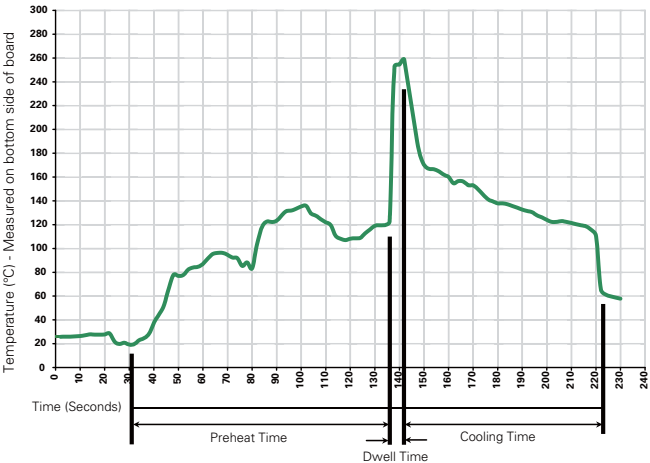
Temperature Derating Curve



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                    |
| Solder Pot Temperature:                  | 260° C Maximum                    |
| Solder Dwell Time:                       | 2-5 seconds                       |

Recommended Hand-Solder Parameters:

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

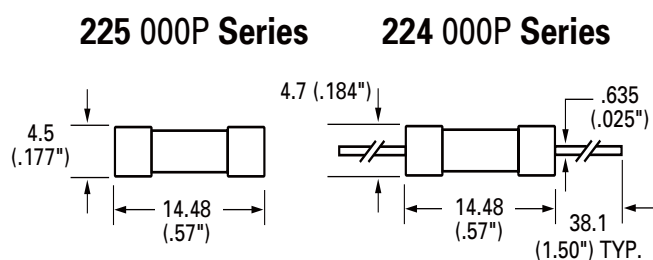
**Note: These devices are not recommended for IR or Convection Reflow process.**

### Product Characteristics

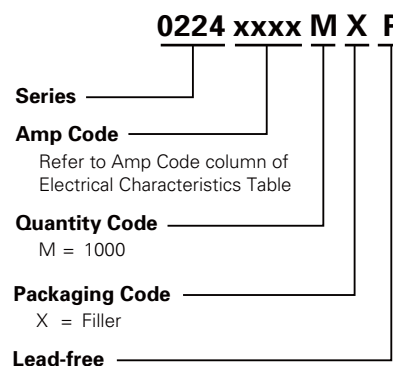
|                          |                                                                                          |
|--------------------------|------------------------------------------------------------------------------------------|
| <b>Materials</b>         | Body : Glass<br>Cap : Nickel-plated brass<br>Leads: Tin-plated Copper                    |
| <b>Terminal Strength</b> | MIL-STD-202F Method 211A, Test Condition A                                               |
| <b>Solderability</b>     | Reference IEC 6012/Second Edition 2003-01 Annex A                                        |
| <b>Product Marking</b>   | Cap1 : Brand logo, current and Voltage Ratings<br>Cap2 : Series and Agency approval Mark |

|                               |                                                                                                  |
|-------------------------------|--------------------------------------------------------------------------------------------------|
| <b>Operating Temperature:</b> | -55°C to +125°C                                                                                  |
| <b>Thermal Shock:</b>         | MIL-STD-202F, Method 107G, Test Condition B (5 Cycles -65°C to +125°C).                          |
| <b>Vibration</b>              | MIL-STD-202F, Method 201A                                                                        |
| <b>Humidity</b>               | MIL-STD-202F Method 103B, Test Condition A: High RH (95%) and elevated temp (40°C) for 240 hours |
| <b>Salt Spray</b>             | MIL-STD-202F Method 101D, Test Condition B                                                       |

### Dimensions



### Part Numbering System



### Packaging

| Packaging Option  | Packaging Specification | Quantity | Quantity & Packaging Code | Taping Width     |
|-------------------|-------------------------|----------|---------------------------|------------------|
| <b>224 Series</b> |                         |          |                           |                  |
| Bulk              | N/A                     | 5        | VX                        | N/A              |
| Bulk              | N/A                     | 5        | VXU                       | N/A              |
| Bulk              | N/A                     | 100      | HX                        | N/A              |
| Bulk              | N/A                     | 100      | HXU                       | N/A              |
| Bulk              | N/A                     | 1000     | MX                        | N/A              |
| Bulk              | N/A                     | 1000     | MX250U                    | N/A              |
| Bulk              | N/A                     | 1000     | MXF16                     | N/A              |
| Bulk              | N/A                     | 1000     | MXF23                     | N/A              |
| Bulk              | N/A                     | 1000     | MXU                       | N/A              |
| Reel and Tape     | EIA 296-E               | 1500     | DRT1                      | T1=52mm (2.062") |
| Reel and Tape     | EIA 296-E               | 1500     | DRT1U                     | T1=52mm (2.062") |
| Reel and Tape     | EIA 296-E               | 1500     | DRT2                      | T2=63mm (2.500") |
| Reel and Tape     | EIA 296-E               | 1500     | DRT3                      | T3=73mm (2.874") |
| Reel and Tape     | EIA 296-E               | 2500     | ERT1                      | T1=52mm (2.062") |
| Reel and Tape     | EIA 296-E               | 2500     | ERT2                      | T2=63mm (2.500") |
| Reel and Tape     | EIA 296-E               | 2500     | ERT3                      | T3=73mm (2.874") |
| Bulk              | N/A                     | 1000     | MX50LE                    | N/A              |
| <b>225 Series</b> |                         |          |                           |                  |
| Bulk              | N/A                     | 5        | VX                        | N/A              |
| Bulk              | N/A                     | 5        | VXU                       | N/A              |
| Bulk              | N/A                     | 100      | HX                        | N/A              |
| Bulk              | N/A                     | 100      | HXU                       | N/A              |
| Bulk              | N/A                     | 1000     | MX                        | N/A              |
| Bulk              | N/A                     | 1000     | MXU                       | N/A              |