

RoHS  **216 Series, 5 x 20 mm, Fast-Acting Fuse**



### Description

5x20mm fast-acting ceramic body cartridge fuse designed to IEC specification.

### Features

- Designed to International (IEC) Standards for use globally
- Meets the IEC 60127-2, sheet 1 specification
- for fast-acting fuses
- Available in cartridge and axial lead form
- RoHS compliant and lead-free

### Agency Approvals

| Agency                                                                              | Agency File Number                                                                                                                                                                                                                                                              | Ampere Range                                                  |
|-------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|
|    | Cartridge Certificates:<br>1-5A NBK 080205-E10480A<br>6.3A-10A NBK 250702-E10480E<br>12.5A NBK 240108-JP1021C<br>16A NBK 240108-JP1021E<br>Leaded Certificates:<br>1-5A NBK 080205-E10480B<br>6.3A-10A NBK 250702-E10480F<br>12.5A NBK 240108-JP1021D<br>16A NBK 240108-JP1021F | 1A – 16A                                                      |
|  | Certificates:<br>2003010207079960                                                                                                                                                                                                                                               | 50mA – 6.3A                                                   |
|  | Certificates:<br>SU05001-2013                                                                                                                                                                                                                                                   | 1A – 10A                                                      |
|  | Recognised File:<br>E10480<br>Guide:<br>JDYX2                                                                                                                                                                                                                                   | 50mA – 10A<br>12.5A, 16A                                      |
|  | File:<br>029862<br>Acc. Class:<br>LR1422-30                                                                                                                                                                                                                                     |                                                               |
|  | File:<br>1027156<br>8117 45<br>1117973<br>1020822<br>1027014                                                                                                                                                                                                                    | 50mA – 125mA<br>160mA – 800mA<br>1A – 6.3A<br>8A – 10A<br>16A |
|  | License:<br>40013834                                                                                                                                                                                                                                                            | 50mA – 6.3A<br>*8A, *10A                                      |
|  | License:<br>40016442                                                                                                                                                                                                                                                            | *12.5A                                                        |
|  | License:<br>KM41462                                                                                                                                                                                                                                                             | 1A – 6.3A                                                     |
|  |                                                                                                                                                                                                                                                                                 | 50mA – 16A                                                    |

\*Approval for Cartridge versions only

### Applications

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

### Electrical Characteristics for Series

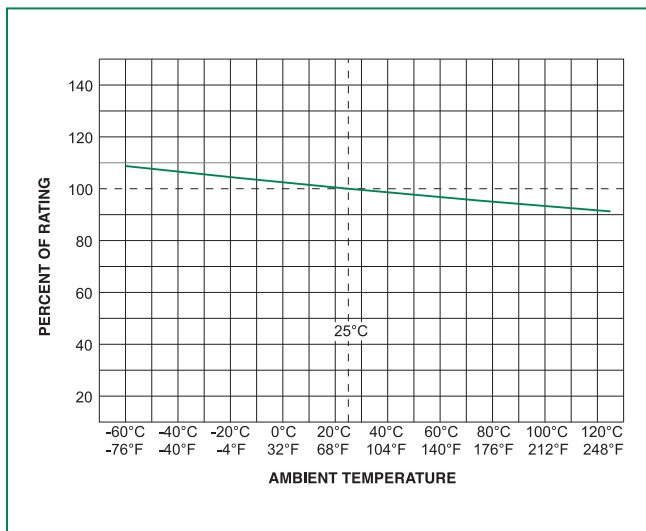
| % of Ampere Rating | Ampere Rating | Opening Time                   |
|--------------------|---------------|--------------------------------|
| 150%               | 50mA – 4A     | 60 minutes, Minimum            |
|                    | 5A – 6.3A     | 60 minutes, Minimum            |
|                    | 8A – 16A      | 30 minutes, Minimum            |
| 210%               | 50mA – 4A     | 30 minutes, Maximum            |
|                    | 5A – 6.3A     | 30 minutes, Maximum            |
|                    | 8A – 16A      | 30 minutes, Maximum            |
| 275%               | 50mA – 4A     | 0.01 sec., Min.; 2 sec. Max.   |
|                    | 5A – 6.3A     | 0.01 sec., Min.; 3 sec. Max.   |
|                    | 8A – 16A      | 0.04 sec., Min.; 20 sec. Max.  |
| 400%               | 50mA – 4A     | .003 sec., Min.; 0.3 sec. Max. |
|                    | 5A – 6.3A     | .003 sec., Min.; 0.3 sec. Max. |
|                    | 8A – 16A      | .01 sec., Min.; 1.0 sec. Max.  |
| 1000%              | 50mA – 4A     | .02 seconds, Maximum           |
|                    | 5A – 6.3A     | .02 seconds, Maximum           |
|                    | 8A – 16A      | .03 sec.onds, Maximum          |

### Electrical Characteristics Specifications by Item

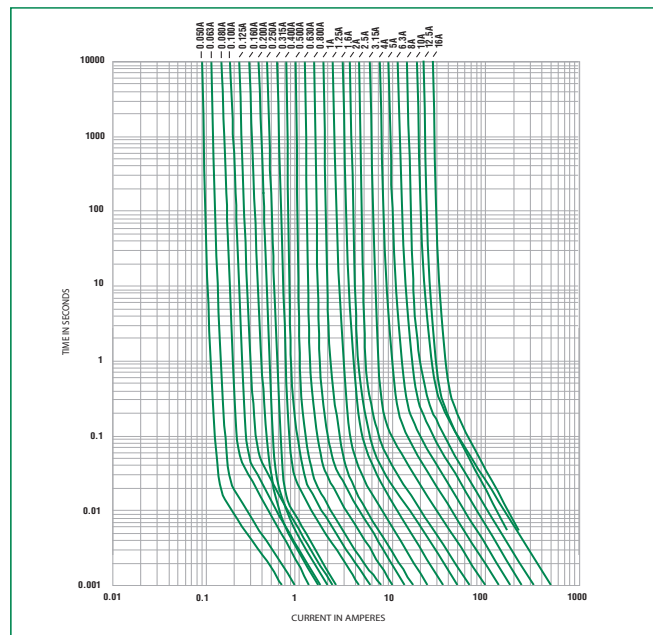
| Amp Code | Amp Rating (A) | Voltage Rating (V) | Interrupting Rating | Nominal Cold Resistance (Ohms) | Nominal Melting I²t (A² sec) | Nominal Voltage Drop at Rated Current (mV) | Nominal Power Dissipation at Rated Current (W) | Agency Approvals                                                                    |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |                                                                                     |  |
|----------|----------------|--------------------|---------------------|--------------------------------|------------------------------|--------------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--|
|          |                |                    |                     |                                |                              |                                            |                                                |  |  |  |  |  |  |  |  |  |  |  |
| .050     | 0.05           | 250                | 1500A@ 250Vac       | 15.9000                        | 0.00019                      | 10000                                      | 1.6                                            |                                                                                     |                                                                                     | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   |                                                                                     |                                                                                     |  |
| .063     | 0.063          | 250                |                     | 10.4500                        | 0.00054                      | 8800                                       | 1.6                                            |                                                                                     |                                                                                     | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   |                                                                                     |                                                                                     |  |
| .080     | 0.08           | 250                |                     | 7.8850                         | 0.00084                      | 7600                                       | 1.6                                            |                                                                                     |                                                                                     | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   |                                                                                     |                                                                                     |  |
| .100     | 0.1            | 250                |                     | 5.7925                         | 0.00450                      | 7000                                       | 1.6                                            |                                                                                     |                                                                                     | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   |                                                                                     |                                                                                     |  |
| .125     | 0.125          | 250                |                     | 3.6750                         | 0.00546                      | 5000                                       | 1.6                                            |                                                                                     |                                                                                     | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   |                                                                                     |                                                                                     |  |
| .160     | 0.16           | 250                |                     | 5.3490                         | 0.00576                      | 4300                                       | 1.6                                            |                                                                                     |                                                                                     | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   |                                                                                     |                                                                                     |  |
| .200     | 0.2            | 250                |                     | 3.3500                         | 0.00439                      | 3500                                       | 1.6                                            |                                                                                     |                                                                                     | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   |                                                                                     |                                                                                     |  |
| .250     | 0.25           | 250                |                     | 2.3500                         | 0.00891                      | 2800                                       | 2.5                                            |                                                                                     |                                                                                     | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   |                                                                                     |                                                                                     |  |
| .315     | 0.315          | 250                |                     | 1.8500                         | 0.01000                      | 2500                                       | 2.5                                            |                                                                                     |                                                                                     | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   |                                                                                     |                                                                                     |  |
| .400     | 0.4            | 250                |                     | 0.9065                         | 0.04000                      | 2000                                       | 2.5                                            |                                                                                     |                                                                                     | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   |                                                                                     |                                                                                     |  |
| .500     | 0.5            | 250                |                     | 0.8660                         | 0.16500                      | 1800                                       | 2.5                                            |                                                                                     |                                                                                     | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   |                                                                                     |                                                                                     |  |
| .630     | 0.63           | 250                |                     | 0.4650                         | 0.17500                      | 1500                                       | 2.5                                            |                                                                                     |                                                                                     | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   |                                                                                     |                                                                                     |  |
| .800     | 0.8            | 250                |                     | 0.2950                         | 0.28500                      | 1200                                       | 2.5                                            |                                                                                     |                                                                                     | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   |                                                                                     |                                                                                     |  |
| 001.     | 1              | 250                |                     | 0.2370                         | 0.18000                      | 1000                                       | 2.5                                            | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   |                                                                                     | x                                                                                   |  |
| 1.25     | 1.25           | 250                |                     | 0.1530                         | 0.48000                      | 800                                        | 4                                              | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   |                                                                                     | x                                                                                   |  |
| 01.6     | 1.6            | 250                |                     | 0.1112                         | 1.00500                      | 600                                        | 4                                              | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   |                                                                                     | x                                                                                   |  |
| 002.     | 2              | 250                |                     | 0.0764                         | 1.87000                      | 500                                        | 4                                              | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   |                                                                                     | x                                                                                   |  |
| 02.5     | 2.5            | 250                |                     | 0.0584                         | 2.69500                      | 400                                        | 4                                              | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   |                                                                                     | x                                                                                   |  |
| 3.15     | 3.15           | 250                |                     | 0.0368                         | 6.70000                      | 350                                        | 4                                              | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   |                                                                                     | x                                                                                   |  |
| 004.     | 4              | 250                |                     | 0.0247                         | 14.99500                     | 300                                        | 4                                              | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   |                                                                                     | x                                                                                   |  |
| 005.     | 5              | 250                |                     | 0.0183                         | 27.46000                     | 250                                        | 4                                              | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   |                                                                                     | x                                                                                   |  |
| 06.3     | 6.3            | 250                |                     | 0.0137                         | 56.43000                     | 200                                        | 4                                              | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   |                                                                                     | x                                                                                   |  |
| 008.     | 8              | 250                |                     | 0.0123                         | 64.31500                     | 200                                        | 4                                              |                                                                                     | x                                                                                   |                                                                                     | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x*                                                                                  |                                                                                     | x                                                                                   |  |
| 010.     | 10             | 250                |                     | 0.0079                         | 154.34000                    | 200                                        | 4                                              |                                                                                     | x                                                                                   |                                                                                     | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   | x*                                                                                  |                                                                                     | x                                                                                   |  |
| 12.5     | 12.5           | 250                |                     | 0.0057                         | 235.00000                    | 200                                        | 4                                              |                                                                                     |                                                                                     |                                                                                     | x                                                                                   | x                                                                                   |                                                                                     | x                                                                                   |                                                                                     | x*                                                                                  | x                                                                                   |  |
| 016.     | 16             | 250                | 750A@ 250Vac        | 0.0040                         | 462.50000                    | 200                                        | 4.5                                            |                                                                                     |                                                                                     |                                                                                     | x                                                                                   | x                                                                                   | x                                                                                   | x                                                                                   |                                                                                     |                                                                                     | x                                                                                   |  |

\* Approval for cartridge versions only.  
I<sup>2</sup>t test at 10x rated current

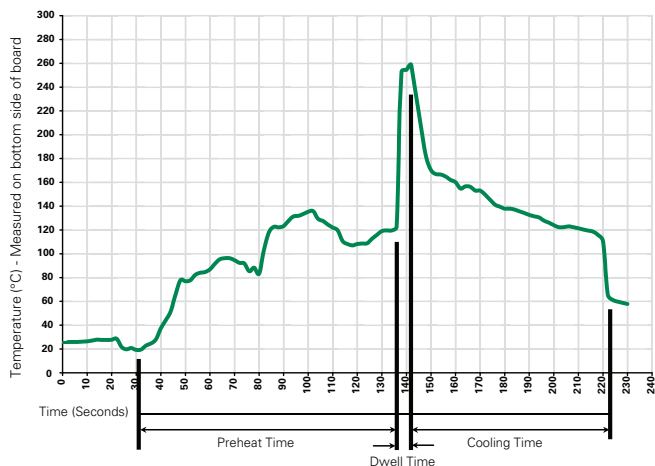
### Temperature Derating Curve



### 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                    |
| <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

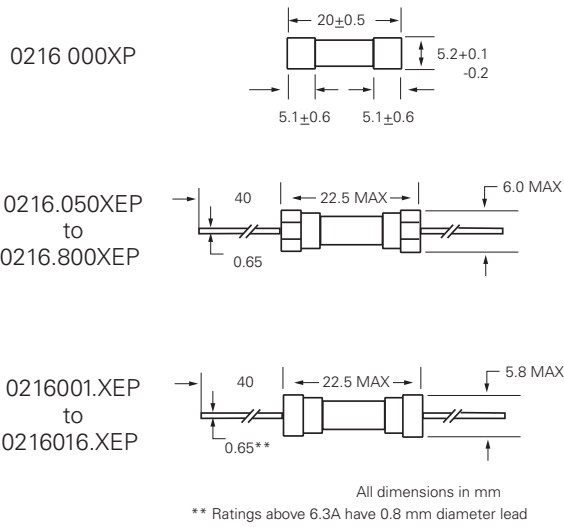
|                          |                                                                                                   |
|--------------------------|---------------------------------------------------------------------------------------------------|
| <b>Material</b>          | Body: Ceramic<br>Cap: Nickel-plated brass<br>Leads: Tin-plated Copper<br>Filler (160mA-16A): Sand |
| <b>Terminal Strength</b> | MIL-STD-202G, Method 211A, Test Condition A                                                       |
| <b>Solderability</b>     | Reference IEC 60127 Second Edition 2003-01 Annex A                                                |
| <b>Product Marking</b>   | Cap 1: Brand logo, current and voltage rating<br>Cap 2: Agency approval markings                  |
| <b>Packaging</b>         | Available in Bulk (M=1000 pcs/pkg) or on Tape/Reel (MRET1=1000 pcs/reel)                          |

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

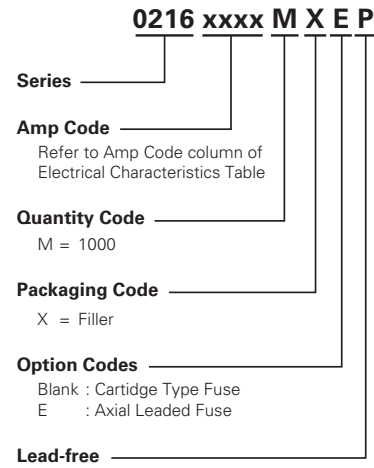
# Axial Lead & Cartridge Fuses

## 5×20 mm > Fast-Acting > 216 Series

### Dimensions



### Part Numbering System



### Packaging

| Packaging Option  | Packaging Specification | Quantity | Quantity & Packaging Code | Taping Width     |
|-------------------|-------------------------|----------|---------------------------|------------------|
| <b>216 Series</b> |                         |          |                           |                  |
| Bulk              | N/A                     | 1000     | MX                        | N/A              |
| Bulk              | N/A                     | 1000     | MXE                       | N/A              |
| Reel and Tape     | EIA 296-E               | 1000     | MRET1                     | T1=52mm (2.062") |
| Bulk              | N/A                     | 1000     | MXG                       | N/A              |
| Bulk              | N/A                     | 1000     | MXB                       | N/A              |
| Bulk              | N/A                     | 100      | HX                        | N/A              |