

## 477 Series, 5x20 mm, Time-Lag Fuse



### Agency Approvals

| Agency | Agency File Number                                                        | Ampere Range                 |
|--------|---------------------------------------------------------------------------|------------------------------|
|        | Cartridge:<br>NBK040609-JP1021A<br>NBK040609-JP1021C<br>NBK100408-JP1021A | 1A – 5A<br>6.3A – 12A<br>16A |
|        | Leaded:<br>NBK040609-JP1021B<br>NBK040609-JP1021D<br>NBK100408-JP1021B    | 1A – 5A<br>6.3A – 12A<br>16A |
|        | 1620077                                                                   | 0.500A – 8A                  |
|        | E10480                                                                    | 0.500A – 16A                 |
|        | 40025413                                                                  | 1A, 3.15A                    |
|        | J50248089                                                                 | 10A, 12A, 16A                |
|        | N/A                                                                       | 0.500A – 16A                 |

### Additional Information



Datasheet



Resources



Samples

### Description

400Vdc/500Vac rated, 5x20mm, time-lag, surge withstand ceramic body cartridge fuse.

### Features

- Designed to International (IEC) Standard for use globally.
- Follow the IEC 60127-2, Sheet 5 specification for time-lag fuses
- Available in cartridge and axial lead form
- RoHS compliant and lead-free

### Applications

High energy and power efficient applications.

### Electrical Characteristics for Series

| % of Ampere Rating | Ampere Rating | Opening Time                   |
|--------------------|---------------|--------------------------------|
| 150%               | .5 - .8       | 60 minutes, Minimum            |
|                    | 1 - 3.15      | 60 minutes, Minimum            |
|                    | 4 - 6.3       | 60 minutes, Minimum            |
|                    | 8 - 16        | 30 minutes, Minimum            |
| 210%               | .5 - .8       | 30 minutes, Maximum            |
|                    | 1 - 3.15      | 30 minutes, Maximum            |
|                    | 4 - 6.3       | 30 minutes, Maximum            |
|                    | 8 - 16        | 30 minutes, Maximum            |
| 275%               | .5 - .8       | .25 sec., Min.; 80 sec. Max.   |
|                    | 1 - 3.15      | .75 sec., Min.; 80 sec. Max.   |
|                    | 4 - 6.3       | .75 sec., Min.; 80 sec. Max.   |
|                    | 8 - 16        | .75 sec., Min.; 80 sec. Max.   |
| 400%               | .5 - .8       | .05 sec., Min.; 5 sec. Max.    |
|                    | 1 - 3.15      | .095 sec., Min.; 5 sec. Max.   |
|                    | 4 - 6.3       | .15 sec., Min.; 5 sec. Max.    |
|                    | 8 - 16        | .15 sec., Min.; 5 sec. Max.    |
| 1000%              | .5 - .8       | .005 sec., Min.; .15 sec. Max. |
|                    | 1 - 3.15      | .01 sec., Min.; .15 sec. Max.  |
|                    | 4 - 6.3       | .01 sec., Min.; .15 sec. Max.  |
|                    | 8 - 16        | .01 sec., Min.; .15 sec. Max.  |

## Electrical Characteristic

| Amp Code | Amp Rating | Max Voltage Rating (V) |     | Interrupting Rating         | Nominal Cold Resistance (Milli-ohms) | Nominal Melting I <sup>2</sup> t (A <sup>2</sup> sec.) <sup>†</sup> | Agency Approvals |       |     |      |     |
|----------|------------|------------------------|-----|-----------------------------|--------------------------------------|---------------------------------------------------------------------|------------------|-------|-----|------|-----|
|          |            | AC                     | DC  |                             |                                      |                                                                     | PS E             | UL US | CS  | △    | VDE |
| .500     | 0.5        | 500                    | 400 | 100A@500VAC<br>1500A@400VDC | 1055.900                             | 0.300                                                               | -                | X*    | X** | -    | -   |
| .800     | 0.8        | 500                    | 400 |                             | 430.000                              | 0.909                                                               | -                | X*    | X** | -    | -   |
| 001.     | 1          | 500                    | 400 |                             | 139.400                              | 1.800                                                               | X                | X*    | X** | -    | X   |
| 002.     | 2          | 500                    | 400 |                             | 55.200                               | 9.120                                                               | X                | X*    | X** | -    | -   |
| 3.15     | 3.15       | 500                    | 400 |                             | 27.700                               | 50.109                                                              | X                | X*    | X** | -    | X   |
| 004.     | 4          | 500                    | 400 | 100A@500VAC<br>500A@400VDC  | 17.200                               | 52.480                                                              | X                | X*    | X** | -    | -   |
| 005.     | 5          | 500                    | 400 |                             | 13.700                               | 76.500                                                              | X                | X*    | X** | -    | -   |
| 06.3     | 6.3        | 500                    | 400 |                             | 10.970                               | 121.451                                                             | X                | X     | X** | -    | -   |
| 008.     | 8          | 500                    | 400 |                             | 8.305                                | 203.520                                                             | X                | X     | X** | -    | -   |
| 010.     | 10         | 500                    | 400 |                             | 4.950                                | 509.000                                                             | X                | X     | -   | X    | -   |
| 012.     | 12         | 500                    | 400 |                             | 4.730                                | 576.000                                                             | X                | X     | -   | X    | -   |
| 016.     | 16         | 500                    | 400 | 100A@500VAC<br>400A@400VDC  | 3.100                                | 1331.200                                                            | X                | X     | -   | X*** | -   |

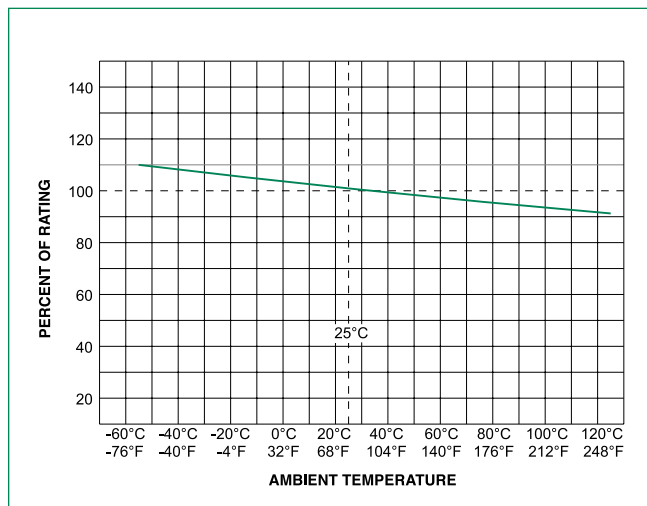
\*100A @ 600Vac also available. Add suffix "MXE6P". Example: 0477004.MXE6P.

\*\*Semko approval for 100A@500Vac and 200A@400Vdc.

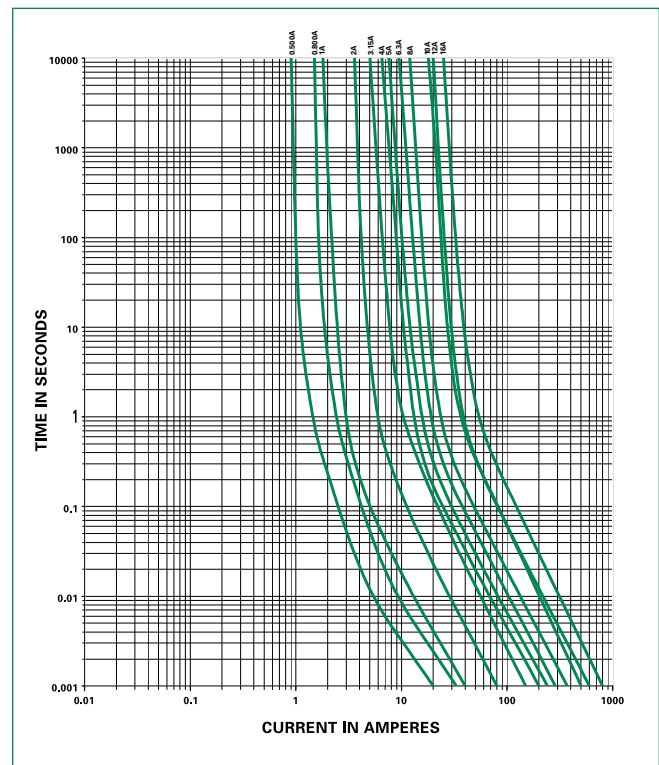
\*\*\*100A@ 500Vac and 300A@400Vdc for 16A

<sup>†</sup>I<sup>2</sup>t test at 10x rated current.

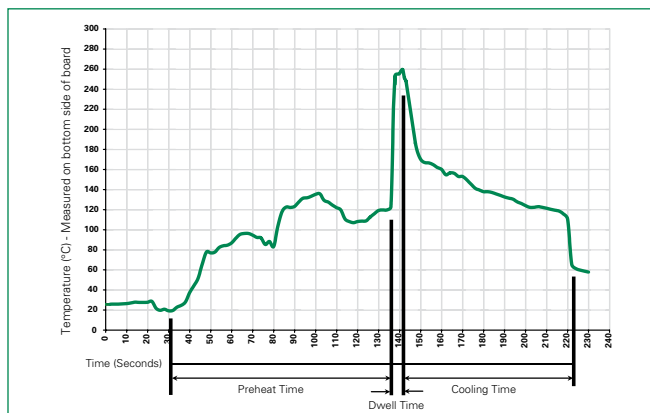
## Temperature Re-rating Curve



## Average Time Current Curves



### Soldering Parameters - Wave Soldering



### Recommended Process Parameters:

| Wave Parameter                                       | Lead-Free Recommendation          |
|------------------------------------------------------|-----------------------------------|
| Preheat:<br>(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.

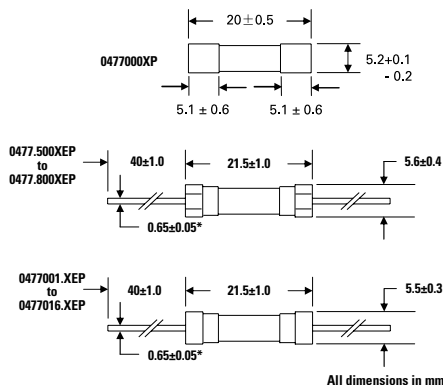
**Note:** These devices are not recommended for IR or Convection Reflow process.

### Product Characteristics

|                          |                                                                                                            |
|--------------------------|------------------------------------------------------------------------------------------------------------|
| <b>Materials</b>         | <b>Body:</b> Ceramic<br><b>Cap:</b> Nickel-plated Brass<br><b>Leads:</b> 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>   | <b>Cap 1:</b> Brand logo, current and voltage ratings<br><b>Cap 2:</b> Series and agency approval markings |
| <b>Packaging</b>         | Available in Bulk (M=1000 pcs/pkg)                                                                         |

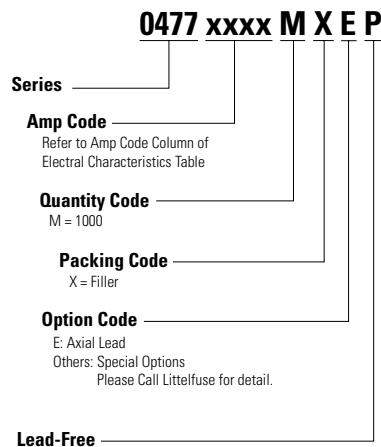
|                              |                                                                                                  |
|------------------------------|--------------------------------------------------------------------------------------------------|
| <b>Operating Temperature</b> | -55°C 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



**Notes:**  
\* Ratings above 5A 1.0 ± 0.05 diameter lead.

### Part Numbering System



### Packaging

| Packaging Option  | Packaging Specification | Quantity | Quantity & Packaging Code | Reel Size        |
|-------------------|-------------------------|----------|---------------------------|------------------|
| <b>477 Series</b> |                         |          |                           |                  |
| Bulk              | N/A                     | 1000     | MX                        | N/A              |
| Bulk              | N/A                     | 1000     | MXE                       | N/A              |
| Reel and Tape     | N/A                     | 1000     | MRET1                     | T1=53mm (2.087") |

**Disclaimer Notice** - Littelfuse products are not designed for, and shall not be used for, any purpose (including, without limitation, automotive, military, aerospace, medical, life-saving, life-sustaining or nuclear facility applications, devices intended for surgical implant into the body, or any other application in which the failure or lack of desired operation of the product may result in personal injury, death, or property damage) other than those expressly set forth in applicable Littelfuse product documentation. Warranties granted by Littelfuse shall be deemed void for products used for any purpose not expressly set forth in applicable Littelfuse documentation. Littelfuse shall not be liable for any claims or damages arising out of products used in applications not expressly intended by Littelfuse as set forth in applicable Littelfuse documentation. The sale and use of Littelfuse products is subject to Littelfuse Terms and Conditions of Sale, unless otherwise agreed by Littelfuse. Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at [www.littelfuse.com/disclaimer-electronics](http://www.littelfuse.com/disclaimer-electronics).