







## 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                                  |
|   | 1219190   | 0.500A – 8A   |
|  | E10480  | 0.5A – 5A(600VAC)<br>0.5A – 16A(400VDC)<br>6.3A – 16A(500VAC) |
|  | 40025413  | 1A, 3.15A (500VAC)<br>1A, 3.15A (400VDC)                      |
|  | 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            |
| 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.   |
| 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.    |
| 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.  |

# Axial Lead & Cartridge Fuses

5x20 mm > Time-Lag > 477 Series

## Electrical Characteristic

| Amp Code | Amp Rating | Max Voltage Rating (V) |     | Interrupting Rating         | Nominal Cold Resistance (Milli-ohms) | Nominal Melting $I^2t$ (A <sup>2</sup> sec.) | Agency Approvals |       |     |   |      |
|----------|------------|------------------------|-----|-----------------------------|--------------------------------------|--|------------------|-------|-----|---|------|
|          |            | AC                     | DC  |                             |                                      |  | PS E             | UL US | S   | △ | 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*** |

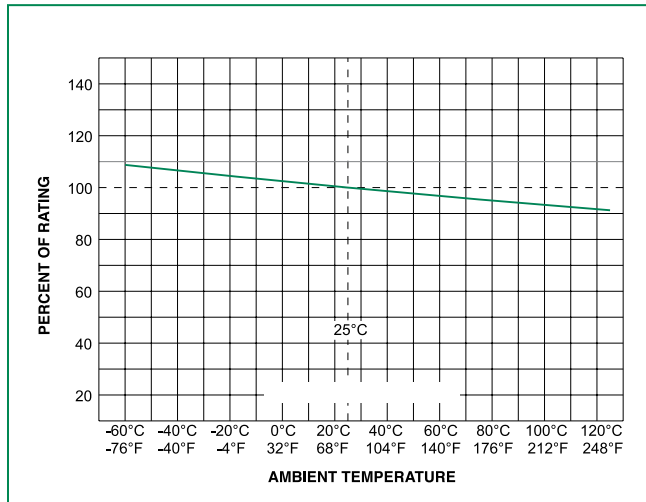
\*100A @ 600Vac also available. Add suffix "MXE6P". Example: 0477004.MXE6P.

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

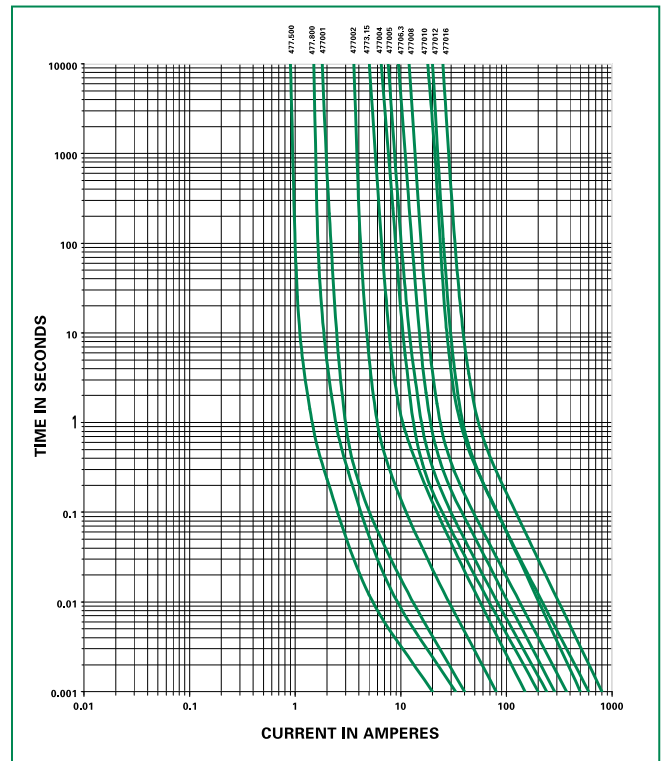
$I^2t$  test at 10x rated current.

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

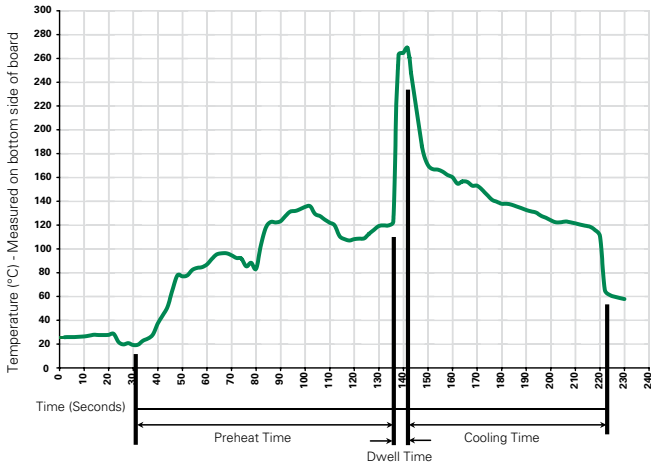
## Temperature Re-rating Curve



## Average Time Current Curves



## Soldering Parameters - Wave Soldering



### Recommended Process Parameters:

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

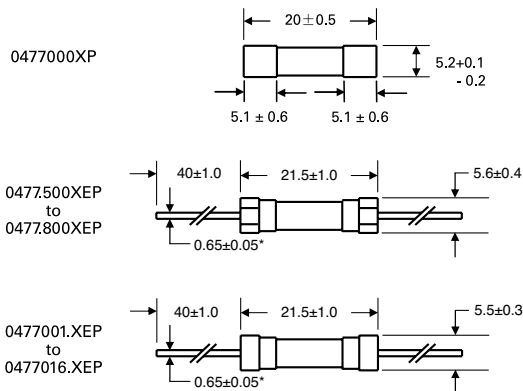
**Note: These devices are not recommended for IR or Convection Reflow process.**

## Product Characteristics

|                          |  |
|--------------------------|--|
| <b>Materials</b>         | <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.

All dimensions in mm

## Part Numbering System

**0477 xxxx M X E P**

|  |      |
|--|------|
| <b>Series</b>  | 0477 |
| <b>Amp Code</b>  | xxxx |
| Refer to Amp Code column of Electrical Characteristics Table |      |
| <b>Quantity Code</b>   | M    |
| M = 1000   |      |
| <b>Packaging Code</b>  | X    |
| X = Filler   |      |
| <b>Option Codes</b>  | E    |
| E : Axial Lead   |      |
| Others : special options.                                    |      |
| Please call Littelfuse for detail.                           |      |
| <b>Lead-Free</b>   | P    |

# Axial Lead & Cartridge Fuses

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## 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") |

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