

# 477 Series

## 5×20 mm, Time-Lag Fuse



### Description

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

### Features & Benefits

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

### Additional Information



Resources



Accessories



Samples

### Agency Approvals

| Agency | Agency File Number              | Ampere Range  |
|--------|---------------------------------|---------------|
|        | Cartridge:<br>NBK040609-JP1021A | 1A – 5A       |
|        | NBK040609-JP1021C               | 6.3A – 12A    |
|        | NBK100408-JP1021A               | 16A           |
|        | Leaded:<br>NBK040609-JP1021B    | 1A – 5A       |
|        | NBK040609-JP1021D               | 6.3A – 12A    |
|        | NBK100408-JP1021B               | 16A           |
|        | 1620077                         | 0.50A – 8A    |
|        | E10480                          | 0.50A – 16A   |
|        | 40025413                        | 1A, 3.15A     |
|        | J50248089                       | 10A, 12A, 16A |
|        | N/A                             | 0.50A – 16A   |
|        | N/A                             | 0.50A – 16A   |

### 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.  |

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### 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  |                             |                                      |                                                                     | CE               | UK CA | UL | CSA | UL  | UL   | VDE |
| .500     | 0.5        | 500                    | 400 | 100A@500VAC<br>1500A@400VDC | 1055.900                             | 0.300                                                               | X                | X     | -  | X*  | X** | -    | -   |
| .800     | 0.8        | 500                    | 400 |                             | 430.000                              | 0.909                                                               | X                | X     | -  | X*  | X** | -    | -   |
| 001.     | 1          | 500                    | 400 |                             | 139.400                              | 1.800                                                               | X                | X     | X  | X*  | X** | -    | X   |
| 002.     | 2          | 500                    | 400 |                             | 55.200                               | 9.120                                                               | X                | X     | X  | X*  | X** | -    | -   |
| 3.15     | 3.15       | 500                    | 400 |                             | 27.700                               | 50.109                                                              | X                | X     | X  | X*  | X** | -    | X   |
| 004.     | 4          | 500                    | 400 | 100A@500VAC<br>500A@400VDC  | 17.200                               | 52.480                                                              | X                | X     | X  | X*  | X** | -    | -   |
| 005.     | 5          | 500                    | 400 |                             | 13.700                               | 76.500                                                              | X                | X     | X  | X*  | X** | -    | -   |
| 06.3     | 6.3        | 500                    | 400 |                             | 10.970                               | 121.451                                                             | X                | X     | X  | X   | X** | -    | -   |
| 008.     | 8          | 500                    | 400 |                             | 8.305                                | 203.520                                                             | X                | X     | X  | X   | X** | -    | -   |
| 010.     | 10         | 500                    | 400 |                             | 4.950                                | 509.000                                                             | X                | X     | X  | X   | -   | X    | -   |
| 012.     | 12         | 500                    | 400 | 100A@500VAC<br>400A@400VDC  | 4.730                                | 576.000                                                             | X                | X     | X  | X   | -   | X    | -   |
| 016.     | 16         | 500                    | 400 |                             | 3.100                                | 1331.200                                                            | X                | X     | X  | X   | -   | X*** | -   |

#### Notes:

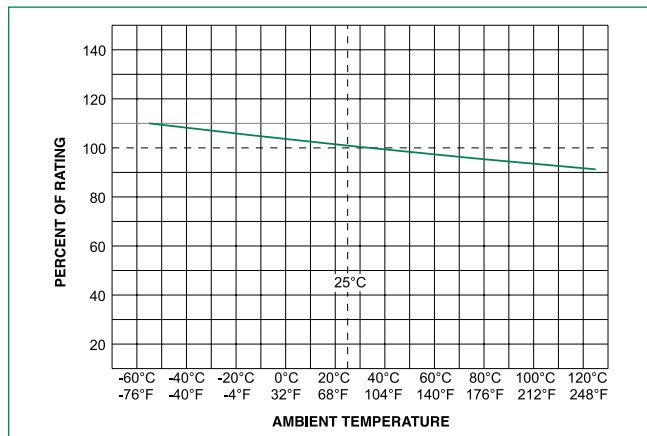
\*100A @ 600Vac also available. Add suffix "MXE6P". Example: 0477004.MXE6P.

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

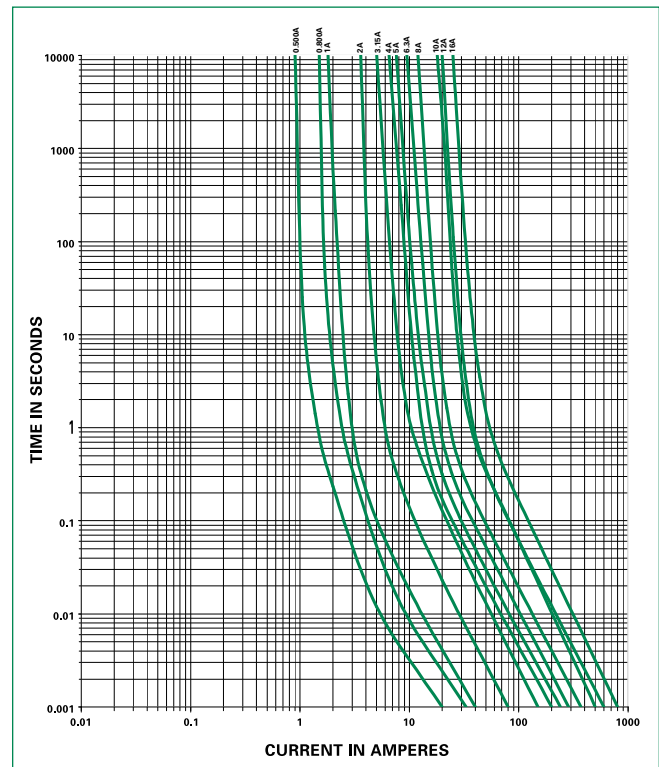
\*\*\*100A@ 500Vac and 300A@400Vdc for 16A.

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

### Temperature Re-rating Curve



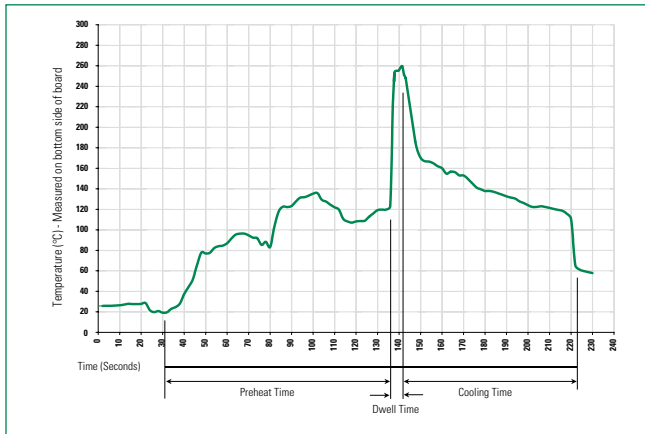
### Average Time Current Curves



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### 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.

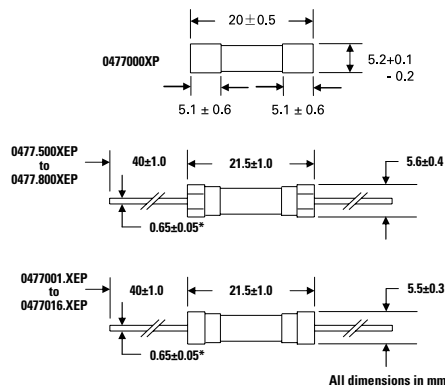
**Note:** These devices are not recommended for IR or Convection Reflow process.

### 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

**0477 xxxx M X E P**

**Series**

**Amp Code**

Refer to Amp Code Column of  
Electrical Characteristics Table

**Quantity Code**

M = 1000

**Packing Code**

X = Filler

**Option Code**

E: Axial Lead  
Others: Special Options  
Please Call Littelfuse for detail.

**Lead-Free**

### 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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