### 235 Series, 5×20 mm, Fast-Acting Fuse



### **Agency Approvals**

| Agency           | Agency File Number  | Ampere Range   |
|------------------|---|--|
| Â <sup>g</sup> u | Cartridge:<br>NBK030609-JP1021A<br>NBK190609-JP1021A<br>NBK030609-JP1021B<br>Leaded:<br>NBK030609-JP1021C<br>NBK190609-JP1021B<br>NBK030609-JP1021D | 1A - 3.5A<br>4A -5A<br>6A -7A<br>1A - 3.5A<br>4A -5A<br>6A -7A |
|                  | SU05001 – 3007<br>SU05001 – 2002<br>SU05001 – 2003  | 0.100A – 0.400A<br>0.500A – 3A<br>4A – 6A                      |
| ų.               | E10480  | 0.100A - 7A  |
| <u>ج</u>         | 29862   | 0.100A - 7A  |
| (E               | N/A   | 0.100A – 7A  |

### Description

5×20mm fast-acting glass body cartridge fuse designed to UL specification.

### Features

- Designed to UL/CSA/ ANCE 248 Standard
- RoHS compliant and lead-free

RoHS 🕫 🧲 🖲 🏵 🐑 🎉

• Available in cartridge and axial lead format

### 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         | OpeningTime        |  |
|--------------------|-----------------------|--------------------|--|
| 100%               | 100% 4 hours, Minimum |                    |  |
| 135%               | 0.100A – 7A           | 1 hour, Maximum    |  |
| 200%               |                       | 5 seconds, Maximum |  |

### **Additional Information**



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Accessories

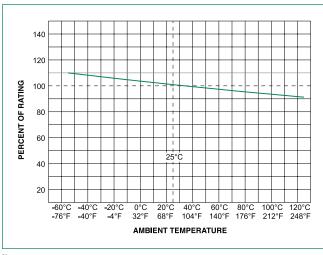
For recommended fuse accessories for this product series, see 'Recommended Accessories' section.



# Axial Lead & Cartridge Fuses 5×20 mm > Time-Lag > 235 Series

|              | Amer Detime   | Voltage                | tage Nominal Cold              |        | Nominal Melting<br>I²t (A² sec) | Agency Approvals |           |   |   |   |
|--------------|---------------|------------------------|--------------------------------|--------|---------------------------------|------------------|-----------|---|---|---|
| Amp Code (A) | Rating<br>(V) | Interrupting<br>Rating | Resistance<br>(Ohms)           | Œ      |                                 | (UL)             | <b>()</b> |   | ß |   |
| .100         | 0.1           | 250                    |                                | 8.4000 | 0.00127                         | х                | х         | х | - | х |
| .125         | 0.125         | 250                    | -                              | 5.7500 | 0.00273                         | х                | x         | x | - | х |
| .200         | 0.2           | 250                    |                                | 3.1500 | 0.00867                         | х                | x         | x | - | х |
| .250         | 0.25          | 250                    |                                | 2.2500 | 0.01660                         | х                | x         | x | - | х |
| .300         | 0.3           | 250                    | 35A @ 250VAC                   | 1.6000 | 0.03215                         | Х                | x         | x | - | х |
| .400         | 0.4           | 250                    | 10kA @ 125VAC                  | 1.075  | 0.05845                         | х                | x         | x | - | х |
| .500         | 0.5           | 250                    |                                | 0.4265 | 0.06915                         | х                | x         | x | - | х |
| .600         | 0.6           | 250                    |                                | 0.3195 | 0.11200                         | х                | x         | x | - | х |
| .700         | 0.7           | 250                    |                                | 0.2625 | 0.15600                         | х                | x         | x | - | х |
| .800         | 0.8           | 250                    |                                | 0.1920 | 0.25300                         | х                | x         | x | - | х |
| 001.         | 1             | 250                    |                                | 0.1530 | 0.46750                         | х                | x         | x | x | х |
| 1.25         | 1.25          | 250                    |                                | 0.1055 | 1.08500                         | х                | x         | x | X | х |
| 01.6         | 1.6           | 250                    |                                | 0.0758 | 2.02500                         | х                | x         | x | x | х |
| 002.         | 2             | 250                    | 100A @ 250VAC<br>10kA @ 125VAC | 0.0603 | 2.64500                         | х                | x         | x | x | х |
| 02.5         | 2.5           | 250                    |                                | 0.0437 | 5.44500                         | х                | x         | x | x | х |
| 003.         | 3             | 250                    |                                | 0.0347 | 8.39500                         | х                | x         | x | x | х |
| 03.5         | 3.5           | 250                    |                                | 0.0331 | 17.14000                        | х                | x         | - | x | - |
| 004.         | 4             | 125                    |                                | 0.0246 | 17.14000                        | х                | x         | × | x | х |
| 005.         | 5             | 125                    | 10kA @ 125VAC                  | 0.0184 | 27.41000                        | х                | x         | х | x | х |
| 006.         | 6             | 125                    | IUKA W IZOVAC                  | 0.0148 | 47.32500                        | х                | x         | × | x | х |
| 007.         | 7             | 125                    |                                | 0.0157 | 64.81500                        | х                | x         | - | x | - |

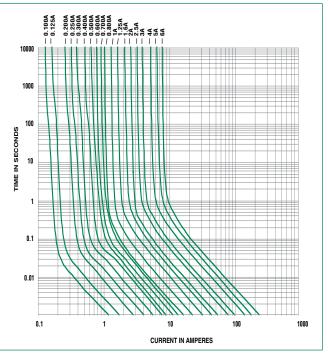
### **Temperature Re-rating Curve**



Note:

Rerating depicted in this curve is in addition to the standard derating of 25% for continuous operation.





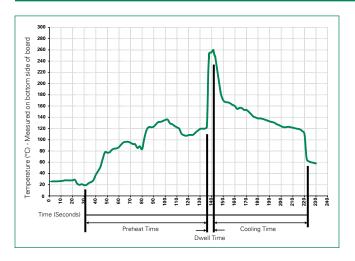
Please contact Littelfuse for details on T-C curve for 7A rating



# Axial Lead & Cartridge Fuses

5×20 mm > Time-Lag > 235 Series

### **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**

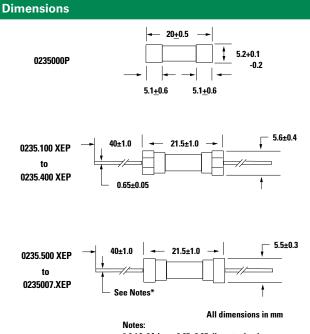
| Materials         | Body: Glass<br>Cap: Nickel-plated brass<br>Leads: Tin-plated Copper                         |  |  |
|-------------------|---|--|--|
| Terminal Strength | MIL-STD-202, Method 211. Test Condition A   |  |  |
| Solderability     | MIL-STD-202 Method 208  |  |  |
| Product Marking   | Cap 1: Brand logo, current and voltage rating<br>Cap 2: Series and agency approval markings |  |  |
| Packaging         | Available in Bulk (M=1000 pcs/pkg) or on Tape/Reel<br>(MRET1=1000 pcs/reel)                 |  |  |

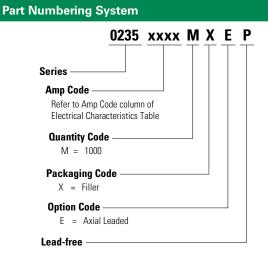
| <b>Operating Temperature</b> | -55°C to +125°C   |
|------------------------------|---|
| Thermal Shock                | MIL-STD-202, Method 107, Test Condition B: (5 cycles $-65^{\circ}C + 125^{\circ}C$ )                        |
| Vibration                    | MIL-STD-202, Method 201   |
| Humidity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



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Notes: \* 0.1A-6A have 0.65±0.05 diameter lead. 7A have 0.8±0.05 diameter lead.

### Packaging

| Packaging Option | Packaging Specification | Quantity   | Quantity &<br>Packaging Code | Taping Width     |
|------------------|-------------------------|------------|------------------------------|------------------|
|                  |                         | 235 Series |                              |                  |
| Bulk             | N/A                     | 1000       | MX                           | N/A              |
| Bulk             | N/A                     | 1000       | MXE                          | N/A              |
| Reel and Tape    | EIA 296-E               | 1000       | MRET1                        | T1=53mm (2.087") |

| Recommended Accessories  |                |   |                            |                             |  |  |
|--------------------------|----------------|---|----------------------------|-----------------------------|--|--|
| Accessory<br>Type        | Series         | Description   | Max Application<br>Voltage | Max Application<br>Amperage |  |  |
|                          | <u>345_ISF</u> | Panel Mount Shock-Safe Fuseholder   |                            | 20                          |  |  |
| Holder <u>345</u><br>830 |                | Shock-Safe Fuseholder with PC Mount, Solder Mount and Panel Mount options |                            | 20                          |  |  |
|                          |                | PC Mount Shock-Safe Miniature Fuseholder                                  |                            | 16                          |  |  |
|                          | 520            | Metric OMNI-BLOK® Fuse Block  |                            | 10                          |  |  |
| Block                    | 646            | PC Mount Miniature Fuse Block   | 250                        | 6.3                         |  |  |
|                          | 658            | Surface Mount Miniature Fuse Block  |                            | 10                          |  |  |
|                          | <u>520_W</u>   | PC Mount Miniature Fuse Clip  |                            | 6.3                         |  |  |
| Clip                     | 111            | PC Board Mount Fuse Clip  |                            | 10                          |  |  |
|                          | 445            | PC Board Mount Fuse Clip  |                            | 10                          |  |  |

#### Notes:

1. Do not use in applications above rating.

2. Please refer to fuseholder data sheet for specific re-rating information.

3. Please contact factory for applications greater than the max voltage and amperage shown.

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