

# Surface Mount Fuses

NANO<sup>2</sup>® Fuse > 250V > Fast Acting > 476 Series

## 476 Series Fuse



### Agency Approvals

| Agency | Agency File Number | Ampere Range |
|--------|--------------------|--------------|
|        | E10480             | 1A - 15A     |
|        | Pending            | 1A - 5A      |
|        | Pending            | 1A - 5A      |

### Applications

- LED Lighting
- LCD/LED TVs
- Power Supply Units
- White Goods

### Description

The 476 Series is a family of 250V rated fuses with a very small 2410 footprint. It is the smallest SMD fuse with this high voltage rating and is designed to mainly serve as primary side circuit protection for compact devices with high voltage requirements.

### Features

- Small 2410 Footprint
- 250V Voltage Rating (1A to 5A)
- High Interrupting Ratings
- Fast-Acting
- RoHS Compliant and Halogen-Free
- Designed in accordance with IEC 60127-4 Universal Modular Fuse requirement
- Wide Operating temperature range of -55°C to 125°C
- IEC 61000-4-5 2 ed. Surge Immunity Test Compliant (1.2 x 50us/8x20us combination wave 500V/250A for <25W Lamp Category) – 3A and above ampere rating only

### Electrical Characteristics for Series

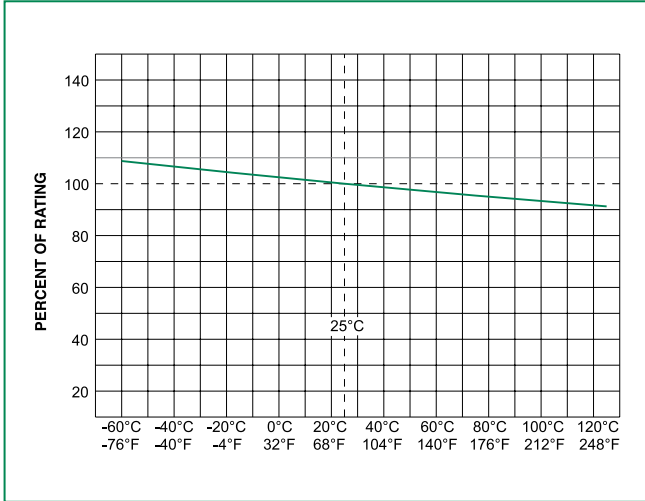
| % of Ampere Rating | Ampere Rating | Opening Time                    |
|--------------------|---------------|---------------------------------|
| 100%               | 1A - 15A      | 4 Hour, Minimum                 |
| 125%               | 1A - 5A       | 1 Hour, Minimum                 |
| 200%               | 1A - 15A      | 120 Sec., Maximum               |
| 1000%              | 1A - 5A       | 0.001 Sec., Min; 0.01 Sec., Max |

### Electrical Characteristic

| Ampere Rating (A) | Amp Code | Max Voltage Rating (V) | Interrupting Rating                            | Nominal Cold Resistance (Ohms) | Nominal Melting I <sup>2</sup> t (A <sup>2</sup> sec.) | Agency Approvals |   |   |
|-------------------|----------|------------------------|--|--------------------------------|--|------------------|---|---|
|                   |          |                        |  |                                |  |                  |   |   |
| 1.00              | 001      | 250V                   | 100A @ 250VAC<br>300A @ 125VDC<br>10kA @ 86VDC | 0.1575                         | 0.193  | x                | P | P |
| 1.25              | 1.25     | 250V                   |  | 0.122                          | 0.276  | x                | P | P |
| 1.60              | 01.6     | 250V                   |  | 0.0825                         | 0.620  | x                | P | P |
| 2.00              | 002      | 250V                   |  | 0.0448                         | 0.530  | x                | P | P |
| 2.50              | 02.5     | 250V                   |  | 0.0363                         | 0.910  | x                | P | P |
| 3.00              | 003      | 250V                   |  | 0.0277                         | 1.660  | x                | P | P |
| 3.50              | 03.5     | 250V                   |  | 0.0234                         | 2.356  | x                | P | P |
| 4.00              | 004      | 250V                   |  | 0.01839                        | 2.820  | x                | P | P |
| 5.00              | 005      | 250V                   |  | 0.0157                         | 4.000  | x                | P | P |
| 6.30              | 06.3     | 125V                   | 100A@125VAC<br>300A@125VDC<br>10kA@86VDC       | 0.0126                         | 7.500  | x                |   |   |
| 7.00              | 007      | 125V                   |  | 0.0116                         | 7.800  | x                |   |   |
| 8.00              | 008      | 125V                   |  | 0.0112                         | 9.757  | x                |   |   |
| 10.0              | 010      | 125V                   |  | 0.0096                         | 14.879   | x                |   |   |
| 12.0              | 012      | 125V                   |  | 0.006                          | 20.635   | x                |   |   |
| 15.0              | 015      | 125V                   |  | 0.0045                         | 61.286   | x                |   |   |

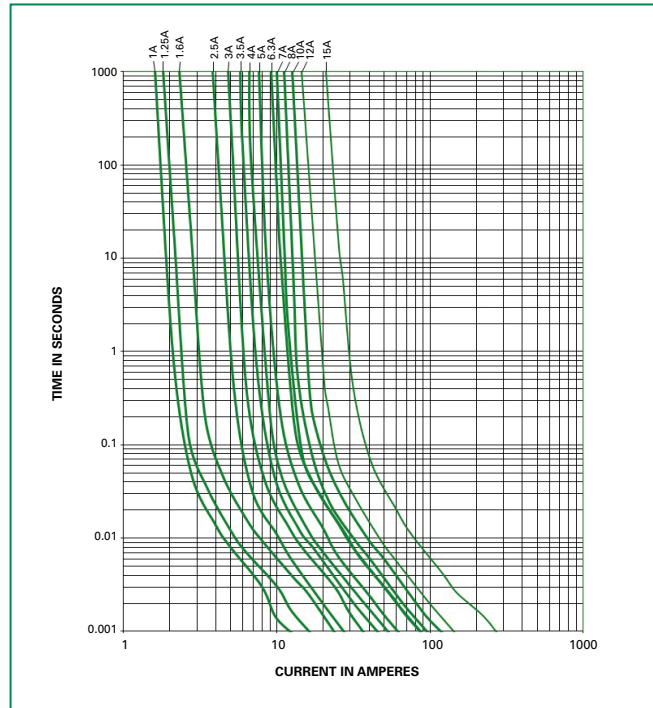
- Notes: 1. Cold resistance measured at less than 10% of rated current at 25°C  
 2. Agency Approval Table Key: X = Approved or Certified, P=Pending and Blank=Not Approved.  
 3. I<sup>2</sup>t values stated for 8msec opening time.  
 4. For 15A rating with 10kA@86VDC IR, please use suffix "S" for ordering. Refer to Part Numbering System for reference.

**Temperature Derating Curve**



**NOTE:** Derating depicted in this curve is in addition to the standard derating of 25% for continuous operation.

**Average Time Current Curves**



**Soldering Parameters**

|  |                                    |                         |
|--|------------------------------------|-------------------------|
| Reflow Condition                                       |                                    | Pb – free assembly      |
| Pre Heat   | - Temperature Min ( $T_{s(min)}$ ) | 150°C                   |
|  | - Temperature Max ( $T_{s(max)}$ ) | 200°C                   |
|  | - Time (Min to Max) ( $t_s$ )      | 60 – 180 seconds        |
| Average Ramp-up Rate (Liquidus Temp ( $T_L$ ) to peak) |                                    | 5°C/second max.         |
| $T_{s(max)}$ to $T_L$ - Ramp-up Rate                   |                                    | 5°C/second max.         |
| Reflow   | - Temperature ( $T_L$ ) (Liquidus) | 217°C                   |
|  | - Temperature ( $t_L$ )            | 60 – 150 seconds        |
| Peak Temperature ( $T_p$ )                             |                                    | 260 <sup>+0/-5</sup> °C |
| Time within 5°C of actual peak Temperature ( $t_p$ )   |                                    | 20 – 40 seconds         |
| Ramp-down Rate   |                                    | 5°C/second max.         |
| Time 25°C to peak Temperature ( $T_p$ )                |                                    | 8 minutes max.          |
| Do not exceed  |                                    | 260°C                   |



### Product Characteristics

|  |  |
|--|--|
| <b>Materials</b>                             | <b>Body:</b> Ceramic<br><b>Cap:</b> Silver Plated Brass/Sn Dipped<br>Silver Plated Brass/Gold Plated Brass |
| <b>Product Marking</b>                       | <b>Body:</b> Brand Logo, Current Rating  |
| <b>Operating Temperature</b>                 | -55°C to +125°C  |
| <b>Moisture Sensitivity Level</b>            | Level 1  |
| <b>Solderability</b>                         | MIL-STD-202, Method 208  |
| <b>Insulation Resistance (after opening)</b> | IEC 60127-4 (0.1Mohm Min)  |

|                                     |  |
|-------------------------------------|--|
| <b>Thermal Shock</b>                | MIL-STD-202, Method 107<br>Test Condition B, 5 cycles, -65°C to 125°C, 15 minutes @ each extreme   |
| <b>Mechanical Shock</b>             | MIL-STD-202, Method 213<br>Test Condition I: De-energized. 100G's peak amplitude, sawtooth wave 6ms duration, 3 cycles XYZ+xyz = 18 shocks |
| <b>Vibration</b>                    | MIL-STD-202, Method 201: 0.03" amplitude, 10-55 Hz in 1 min. 2 hrs. each XYZ = 6hrs (10- 55 Hz)  |
| <b>Moisture Resistance</b>          | MIL-STD-202, Method 106<br>10 cycles   |
| <b>Salt Spray</b>                   | MIL-STD-202, Method 101<br>Test Condition B (48 hrs)   |
| <b>Resistance to Soldering Heat</b> | MIL-STD-202, Method 210,<br>Test Condition B (10 sec at 260°C)   |

### Dimensions



Recommended Pad Layout

### Part Numbering System



### Packaging

| Packaging Option   | Packaging Specification       | Quantity | Quantity & Packaging Code | Reel Size |
|--------------------|-------------------------------|----------|---------------------------|-----------|
| 12mm Tape and Reel | EIA-RS-481-2 (IEC 286 part 3) | 1000     | MR                        | N/A       |

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