

# 463 Series NANO2® Fuse



## Description

The 463 series NANO2® is a fast-acting, very high current fuse designed for high operating current applications. It offers superior thermal cycling endurance of 500 cycles with its low temperature rise and excellent temperature stability characteristics. It is ideal to be used in datacom and telecom equipment such as high end servers, base stations, power supplies, and blade computing applications.

The 463 series offers high-amp circuit protection, ultra-high interrupting ratings (up to 500A@ 72VDC) and small size (10.1 mm x 3.12 mm x 3.12 mm) and surface-mount form-factor to help space saving.

## Features & Benefits

- Surface mount fuse in a small footprint
- High current rating 15A-30A
- Higher voltage rating up to 100VDC and 250VAC
- High melting i2t
- Enhanced thermal cycling endurance
- Operating temperature range from -55°C to 125°C
- RoHS Compliant and Halogen-Free
- Recognized to UL/CSA/NMX 248-1 and UL/CSA/NMX 248-14
- Conforms to EN/IEC 60127-1 and EN/IEC 60127-7

## Additional Information



Resources



Accessories



Samples

## Agency Approvals

| Agency | Agency File/Certificate Number | Ampere Range |
|--------|--------------------------------|--------------|
|        | E10480                         | 15A - 30A    |
|        | NBK101105-E184655              | 15A          |
|        | J50478975                      | 15A - 30A    |
|        | NA                             | 15A - 30A    |

## Applications

- High end servers / Blade computing
- Base station power supply
- Voltage regulator module
- Cooling fan system for PC Server
- Advance Telecommunication Computing Architecture (ATCA) applications for cloud computing
- Battery Management System (Industrial Tools)

## Electrical Characteristics for Series

| % of Ampere Rating | Opening Time    |
|--------------------|-----------------|
| 100%               | 4 Hours, Min.   |
| 200%               | 60 Second, Max. |

## Electrical Characteristic Specifications by Item

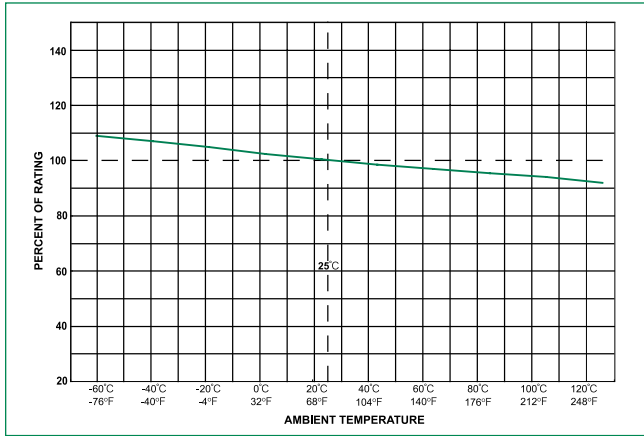
| Ampere Rating (A) | Ampere Code | Max Voltage Rating (V) | Interrupting Rating <sup>4</sup> | Nominal Cold Resistance (Ohms) | Nominal Melting I <sup>2</sup> t (A <sup>2</sup> sec) | Agency Approvals |   |   |   |
|-------------------|-------------|------------------------|----------------------------------|--------------------------------|---|------------------|---|---|---|
|                   |             |                        |                                  |                                |   |                  |   |   |   |
| 15                | 015.        | 250                    | 100A@250VAC<br>300A@65VAC        | 0.0047                         | 142   | x                | x | x | x |
| 20                | 020.        | 250                    | 500A @ 72VDC<br>50A@100VDC       | 0.0027                         | 433   | x                | - | x | x |
| 25                | 025.        | 250                    | 1000A @ 32VDC<br>800A @ 57VDC    | 0.00215                        | 668   | x                | - | x | x |
| 30                | 030.        | 250                    | 1400A @ 48VDC<br>2500A @ 12VDC   | 0.00193                        | 916   | x                | - | x | x |

**Notes:**

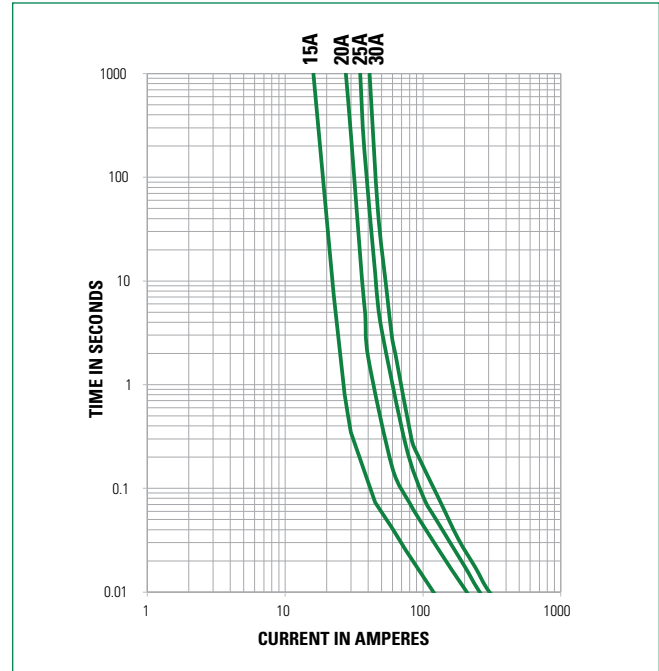
1. Cold resistance measured at less than 10% of rated current at 23°C.
2. Agency Approval Table Key: X=Approved or Certified, P=Pending and Blank=Not Approved.
3. I<sup>2</sup>t values stated for 10 msec opening time.
4. Interrupting Rating may differ based on Agency Approval. See Agency Approval certificate for more details.

# 463 Series NANO2® Fuse

Temperature Derating Curve

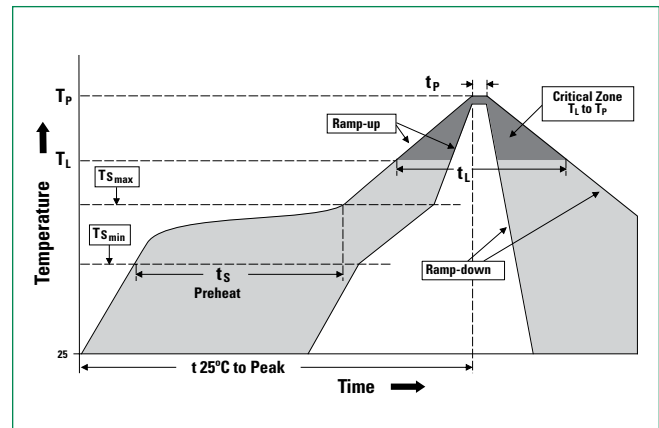


Average Time Current Curves



Soldering Parameters

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



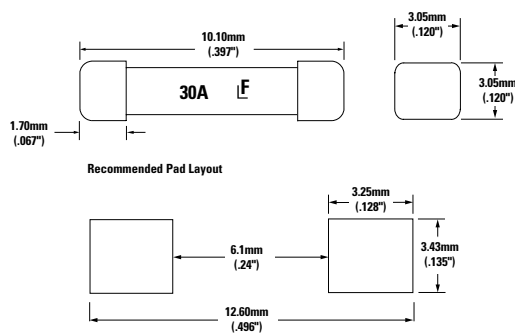
# 463 Series NANO2® Fuse

## Product Characteristics

|  |   |
|--|---|
| <b>Materials</b>                                 | Body : Ceramic<br>Cap : Silver Plated Brass   |
| <b>Product Marking</b>                           | Body: Brand Logo, Current Rating  |
| <b>Insulation Resistance (after Opening)</b>     | MIL-STD-202, Method 302, Test Condition A (10,000 ohms, Minimum)  |
| <b>Solderability</b>                             | MIL-STD-202, Method 208   |
| <b>Resistance to Soldering Heat</b>              | MIL-STD-202, Method 210, Test Condition B (10 sec at 260°C)   |
| <b>PCB Recommendation for Thermal Management</b> | Min. copper layer thickness = 100µm<br>Minimum copper trace width = 10mm  |
|  | Alternate methods of thermal management may be used. In such cases, under normal operations, the maximum temperature of the fuse body should not exceed 80°C in a 25°C environment. |
| <b>Operating Temperature</b>                     | -55°C to 125°C with proper derating   |

|                            |  |
|----------------------------|--|
| <b>Thermal Shock</b>       | MIL-STD-202, Method 107, Test Condition B, 5 cycles, -65°C to 125°C, 15 minutes @ each extreme   |
| <b>Mechanical Shock</b>    | MIL-STD-202, Method 213, Test Condition I: De-energized. 100G's peak amplitude, sawtooth wave 6ms duration, 3 cycles XYZ+xyz = 18                      |
| <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-202F, Method 106, 10 cycles  |
| <b>Salt Spray</b>          | MIL-STD-202, Method 101, Test Condition B (48hrs)  |
| <b>Thermal Cycling</b>     | 500 cycles: 15 minutes at -30°C (+0/-5°C), 5°C / minute ramp rate up to 80°C, 15 minutes at 80°C (+3/-0°C), 5°C / minute ramp rate back down to -30°C. |

## Dimensions



## Part Numbering System

**0463 030. E R**

**Series** ————

**Amp Code\*** ————  
Refer to Amp Code column of Electrical Characteristics Table

**Quantity Code** ————  
E = 2,500 pieces

**Packaging Code** ————  
R = Tape and Reel

**\*Example:** 30 Amp is 0463030.ER

## Packaging

| Packaging Option   | Packaging Specification | Quantity | Quantity & Packaging Code |
|--------------------|-------------------------|----------|---------------------------|
| <b>463 Series</b>  |                         |          |                           |
| 24mm Tape and Reel | EIA-RS-481-2            | 2500     | ER                        |

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