

# 304 Series

## PICO® 277V Intrinsically Safe Fuse



### Agency Approvals

| Agency | Agency File Number                         | Ampere Rating |
|--------|--------------------------------------------|---------------|
|        | DEMKO 13 ATEX 1200U<br>Ex II 1 G Ex ia IIC | 50 - 750mA    |
|        | E358130                                    | 50 - 750mA    |
|        | IECEx UL 13.0077U Ex ia IIC                | 50 - 750mA    |
|        | NA                                         | 50 - 750mA    |

### Reference Standards

| Agency        | Standards                                                                                           |
|---------------|-----------------------------------------------------------------------------------------------------|
| ATEX          | EN 60079-0, EN 60079-11, EN 60079-26                                                                |
| IECEx         | IEC 60079-0, IEC 60079-11, IEC 60079-26                                                             |
| United States | UL 913, UL 60079-0, UL 60079-11, UL 248-1, UL 248-14                                                |
| Canada        | CAN/CSA C22.2 No. 157, CAN/CSA C22.2 No. 60079-0, CAN/CSA C22.2 No. 60079-11, CSA 248-1, CSA 248-14 |

### Description

The PICO® 304 Series offers a range of surface mountable encapsulated fuses certified as intrinsically safe components that can be used in hazardous locations. Ideal for use in oil, gas, mine, chemical, pharmaceutical and process industries, the PICO® 304 Series surface mountable fuse was designed to limit the energy and temperature generated during its operation. The fuse design and its encapsulant are suitable for use in intrinsically safe apparatus and associated apparatus for peak voltage not exceeding 375V.

### Features

- Surface Mountable
- Encapsulated and sealed (1mm minimum)
- High breaking capacity of 1500A at 277V AC/DC
- Current rating options from 0.050 to 0.750A
- Global hazardous location certifications
- Suitable for Class I, Class II, Class III, and Zone 0 Hazardous Location.
- RoHS-compliant

### Applications

- Testing, measuring or processing electronic and electrical equipment
- Motor controllers
- Communication handsets/two-way radios
- Process control and automation
- Sensors
- Lighting
- Flow/gas meters

### Electrical Characteristics for Series

| % of Ampere Rating | Opening Time        |
|--------------------|---------------------|
| 110%               | 4 Hours, Minimum    |
| 300%               | 10 Seconds, Maximum |

### Electrical Specifications by Items

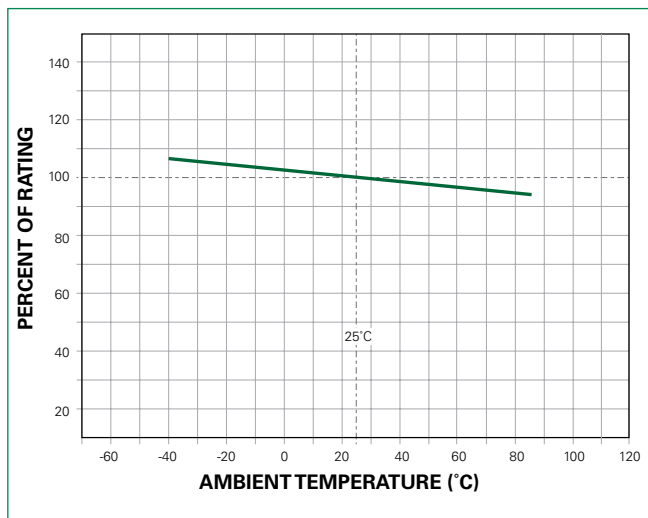
| Catalog Number | Ampere Rating (A) | Amp Code | Interrupting Rating | Nominal Melting I <sub>t</sub> (A <sup>2</sup> Sec.) | Minimum Cold Resistance at -20°C (Ohms) | Minimum Cold Resistance at -40°C (Ohms) | Nominal Cold Resistance at 25°C (Ohms) | Agency Approvals |   |   |   |   |
|----------------|-------------------|----------|---------------------|------------------------------------------------------|-----------------------------------------|-----------------------------------------|----------------------------------------|------------------|---|---|---|---|
|                |                   |          |                     |                                                      |                                         |                                         |                                        |                  |   |   |   |   |
| 0304.050       | 0.050             | .050     | 1500A @ 277VAC/DC   | 0.00019                                              | 9.202                                   | 9.010                                   | 12.00                                  | X                | X | X | X | X |
| 0304.080       | 0.080             | .080     |                     | 0.00035                                              | 6.031                                   | 5.963                                   | 8.19                                   | X                | X | X | X | X |
| 0304.100       | 0.100             | .100     |                     | 0.00070                                              | 2.709                                   | 2.668                                   | 5.00                                   | X                | X | X | X | X |
| 0304.160       | 0.160             | .160     |                     | 0.00202                                              | 2.297                                   | 2.292                                   | 3.00                                   | X                | X | X | X | X |
| 0304.200       | 0.200             | .200     |                     | 0.00288                                              | 1.935                                   | 1.839                                   | 2.68                                   | X                | X | X | X | X |
| 0304.250       | 0.250             | .250     |                     | 0.00662                                              | 1.268                                   | 1.105                                   | 1.60                                   | X                | X | X | X | X |
| 0304.500       | 0.500             | .500     |                     | 0.04462                                              | 0.392                                   | 0.368                                   | 0.46                                   | X                | X | X | X | X |
| 0304.750       | 0.750             | .750     |                     | 0.13448                                              | 0.219                                   | 0.196                                   | 0.27                                   | X                | X | X | X | X |

- Notes:** 1. The fuse must be mounted so that creepage and clearance distances are not impaired in any way.  
 2. The fuse is suitable for use in intrinsically safe equipment and associated apparatus for voltage not exceeding 375V peak.  
 3. Maximum surface temperature rise at 170% rated current: ≤200mA = 88°C, 250mA = 52°C, 500mA = 52°C, and 750mA = 45°C.

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### Temperature Derating Curve



#### Notes:

1. Derating depicted in this curve is in addition to the standard derating of 25% for continuous operation.
2. The temperature derating curve represents the nominal conditions. For questions about temperature derating curve, please consult Littelfuse technical support for assistance.

### Product Characteristics

| Operating Temperature |                     |
|-----------------------|---------------------|
| Current Rating        | Ambient Temperature |
| ≤0.200A               | -40°C to +60°C      |
| 0.250A                | -40°C to +56°C      |
| 0.500A                | -40°C to +84°C      |
| 0.750A                | -40°C to +56°C      |

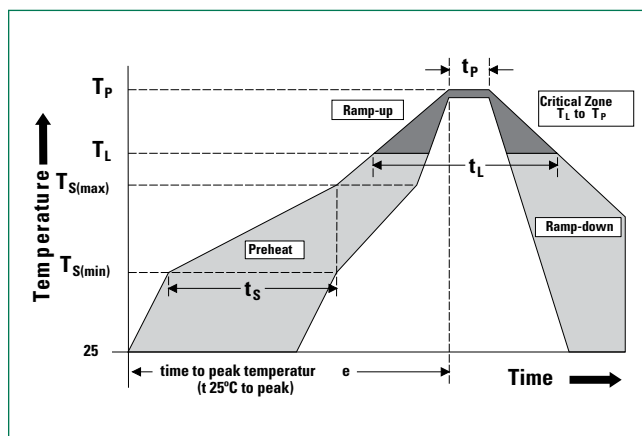
#### Notes:

1. Any use of the 304 Series fuse outside of the ambient temperature ranges specified in the table is subject to additional investigation.
2. Specified ambient temperature range is for intrinsic safety certification.

|                                              |                                                                                     |
|----------------------------------------------|-------------------------------------------------------------------------------------|
| <b>Molding Material</b>                      | Polyamide 6T/66<br>CTI 175 volts minimum<br>Continuous Operating Temperature: 140°C |
| <b>Thermal Shock</b>                         | Withstands 5 cycles of -55°C to 125°C                                               |
| <b>Mechanical Shock</b>                      | MIL-STD-202, Method 213                                                             |
| <b>Insulation Resistance (After Opening)</b> | Greater than 10,000 ohms (at twice rated DC voltage)                                |
| <b>Resistance to Soldering Heat</b>          | MIL-STD-202, Method 210                                                             |
| <b>Moisture Resistance</b>                   | MIL-STD-202, Method 106                                                             |
| <b>Salt Fog Test</b>                         | MIL-STD-202, Method 101                                                             |

### Soldering Parameters

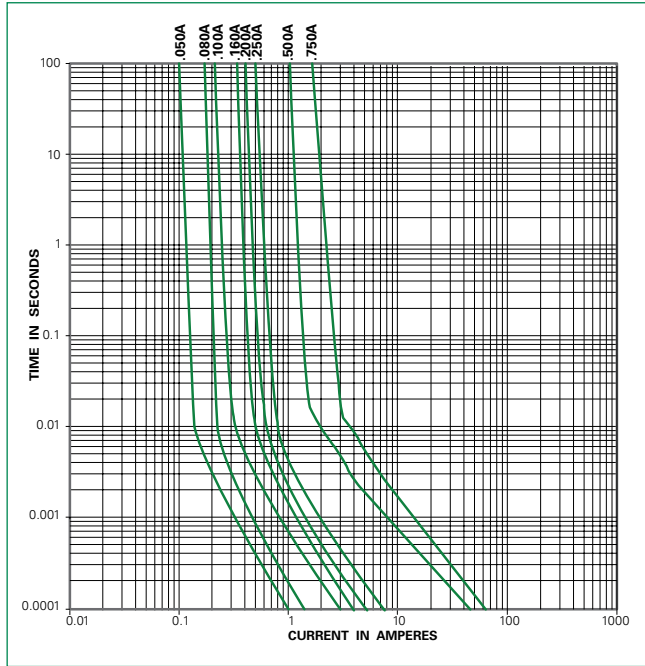
|                                                        |                                    |                         |
|--------------------------------------------------------|------------------------------------|-------------------------|
| Reflow Condition                                       |                                    | 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 – 120 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                   |
| Wave Soldering                                         |                                    | 260°C, 10 sec. max      |



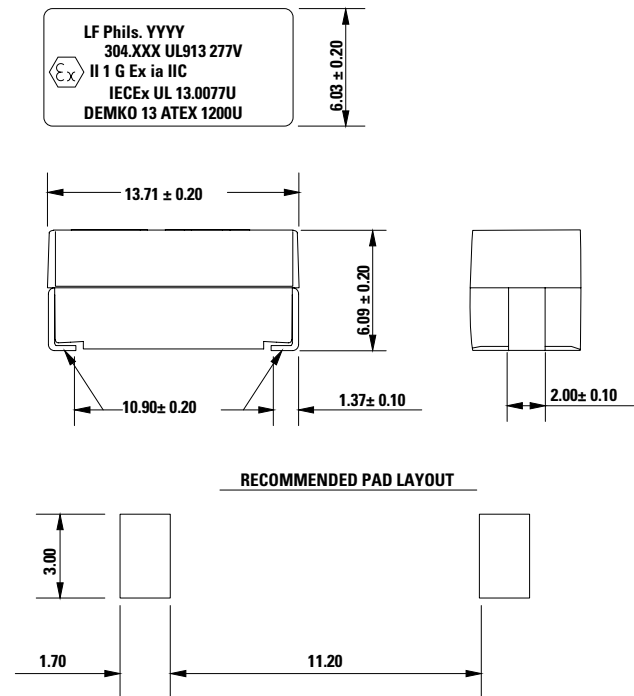
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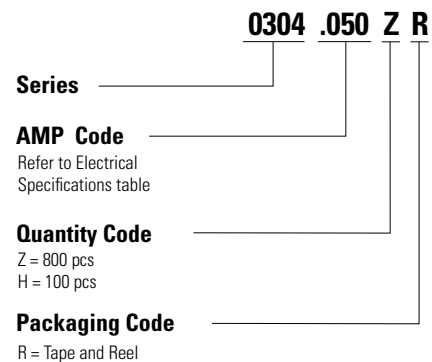
Average Time Current Curves



Dimensions (mm)



Part Numbering System



Packaging

| Packaging Option   | Packaging Specification | Quantity | Quantity & Packaging Code |
|--------------------|-------------------------|----------|---------------------------|
| 24mm Tape and Reel | EIA 481-1               | 800      | ZR                        |
|                    |                         | 100      | HR                        |

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