



RoHS Pb HF 467 Series Fuse

Agency Approvals

| AGENCY | AGENCY FILE NUMBER | AMPERE RANGE |
|---|--------------------|--------------|
|  | E10480 | 250MA - 5A |
|  | LR29862 | 250MA - 5A |

Electrical Characteristics for Series

| % of Ampere Rating | Opening Time at 25°C |
|--------------------|----------------------|
| 100% | 4 hours, Minimum |
| 200% | 5 sec., Maximum |
| 300% | 0.2 sec., Maximum |

Description

The 467 Series Fast-Acting SMF is an ultra small (0603 size) thin-film device designed for secondary protection of circuits used in space constrained applications such as hand-held portable electronic devices. This series is 100% lead-free and meets the requirements of the RoHS directive. New Halogen-Free 467 Series fuses are available—to order use the “HF” suffix. See Part Numbering section for additional information..

Features



- Compatible with lead-free solders and higher temperature profiles.
- High performance materials provide improved performance in elevated ambient temperature applications.
- Marked on top surface with code to allow amp rating identification without testing.
- Low profile for height sensitive applications.
- Flat top surface for pick-and-place operations.
- Element covering material is resistant to industry standard cleaning operations.
- Mounting pad and electrical performance is identical to Littelfuse 431 and 434 Series products.
- Alloy based element construction provides superior inrush withstand characteristics (I²t) over ceramic or glass based 0603 fuse products.

Applications

Secondary protection for space constrained applications:

- Cell phones
- Digital cameras
- Hard disk drives
- Battery packs
- DVD players

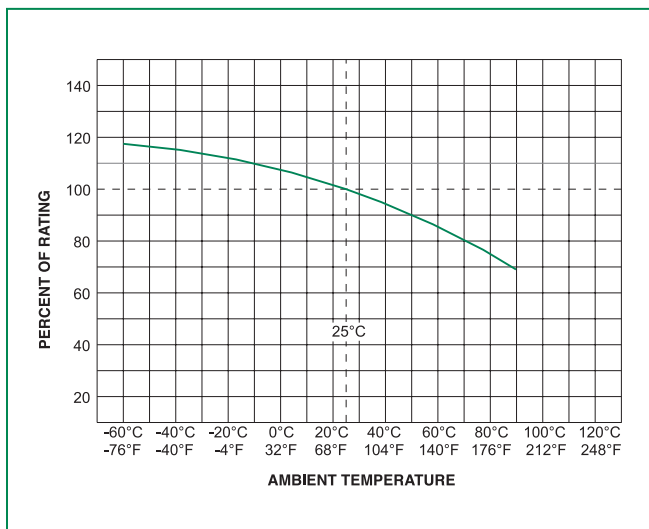
Electrical Specifications by Item

| Ampere Rating (A) | Amp Code | Max Voltage Rating (V) | Interrupting Rating | Nominal Cold Resistance (Ohms) | Nominal Melting I ² t (A ² sec) | Nom Voltage Drop (mV) | Nom Power Dissipation (W) | Agency Approvals | |
|-------------------|----------|------------------------|-------------------------------|--------------------------------|---|-----------------------|---------------------------|---|---|
| | | | | | | | |  |  |
| 0.250 | .250 | 32 | 50A @32V AC/DC | 0.5450 | 0.0030 | 158.56 | 0.0396 | x | x |
| 0.375 | .375 | 32 | | 0.2900 | 0.0053 | 128.03 | 0.0480 | x | x |
| 0.500 | .500 | 32 | | 0.1870 | 0.0087 | 115.71 | 0.0579 | x | x |
| 0.750 | .750 | 32 | | 0.1170 | 0.0171 | 107.33 | 0.0805 | x | x |
| 1.00 | 001. | 32 | | 0.0710 | 0.0212 | 89.10 | 0.0891 | x | x |
| 1.25 | 1.25 | 32 | 35A @32V AC/DC 13A @65V DC | 0.0530 | 0.0518 | 84.32 | 0.1054 | x | x |
| 1.50 | 01.5 | 32 | | 0.0410 | 0.0766 | 81.14 | 0.1217 | x | x |
| 1.75 | 1.75 | 32 | 35A @32V AC/DC | 0.0320 | 0.0903 | 78.75 | 0.1378 | x | x |
| 2.00 | 002. | 32 | | 0.0300 | 0.1103 | 78.22 | 0.1564 | x | x |
| 2.50 | 02.5 | 32 | | 0.0220 | 0.1440 | 76.10 | 0.1903 | x | x |
| 3.00 | 003. | 32 | | 0.0180 | 0.2403 | 75.04 | 0.2251 | x | x |
| 3.50 | 03.5 | 32 | | 0.0150 | 0.4306 | 74.25 | 0.2599 | x | x |
| 4.00 | 004. | 32 | | 0.0130 | 0.5760 | 73.72 | 0.2949 | x | x |
| 5.00 | 005. | 32 | | 0.0090 | 0.9000 | 72.71 | 0.3635 | x | x |

1. Measured at 10% of rated current, 25°C. 2. Measured at rated voltage.
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Specifications are subject to change without notice.
 Please refer to www.littelfuse.com/series/467.html for current information.

Temperature Derating Curve



Note:

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

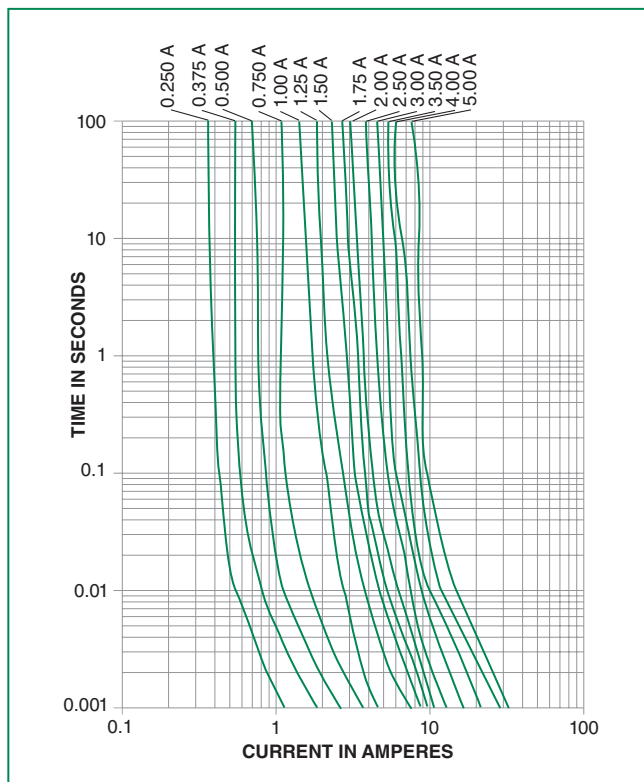
Example:

For continuous operation at 70 degrees celsius, the fuse should be derated as follows:

$$I = (0.75)(0.80)I_{RAT} = (0.60)I_{RAT}$$

- The temperature derating curve represents the nominal conditions. For questions about temperature derating curve, please consult Littelfuse technical support for assistance.

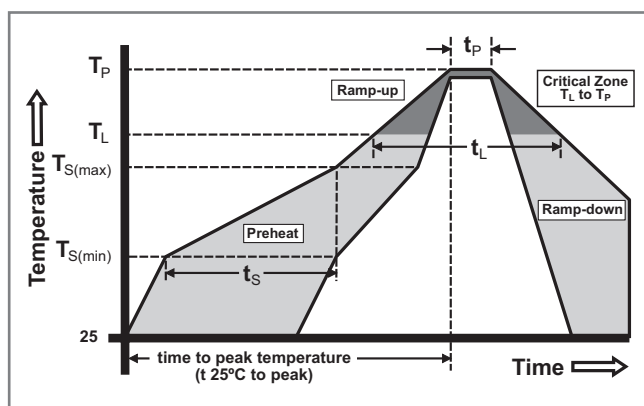
Average Time Current Curves



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 secs |
| 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) | | 250 ^{+0/-5} °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 seconds max. |
|----------------|------------------------|

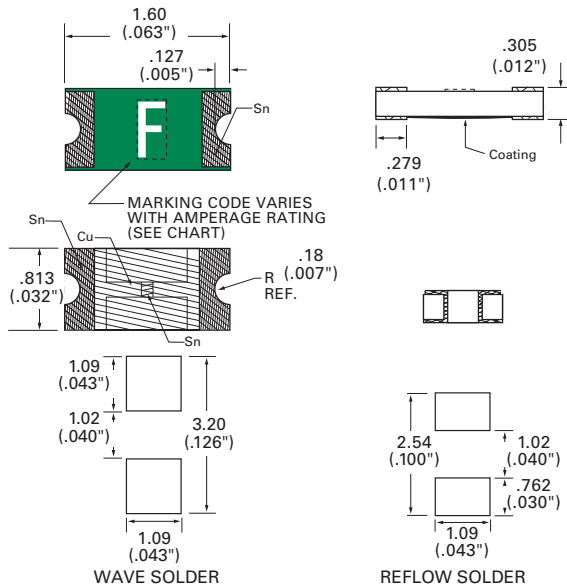


Product Characteristics

| | |
|------------------------------|---|
| Materials | Body: Advanced High Temperature Substrate Terminations: 100% Tin over Nickel over Copper Element Cover Coat: Conformal Coating |
| Operating Temperature | - 55°C to 90°C. Consult temperature derating curve chart. For operation above 90°C contact Littelfuse. |
| Humidity | MIL-STD-202F, Method 103B, Condition D |

| | |
|--|--|
| Thermal Shock | Withstands 5 cycles of - 55°C to 125°C |
| Vibration | Per MIL-STD-202F |
| Insulation Resistance (After Opening) | Greater than 10,000 ohms. |

Dimensions



Part Marking System

| Amp Code | Marking Code |
|----------|--------------|
| .250 | D |
| .375 | E |
| .500 | F |
| .750 | G |
| 001. | H |
| 1.25 | J |
| 01.5 | K |
| 1.75 | L |
| 002. | N |
| 02.5 | O |
| 003. | P |
| 03.5 | R |
| 004. | S |
| 005. | T |

Part Numbering System

0467002.NRHF

SERIES

AMP Code

The dot is positioned before the Packaging Suffix with whole ratings and within the numbering sequence for fractional ratings. Refer to Amp Code column in the Electrical Specifications table.

PACKAGING Code

NR = Tape and Reel, 5000 pcs

'HF' SUFFIX

HALOGEN FREE ITEM

Example:

1.5 amp product is 0467**01.5**NRHF (2 amp product shown above).

Packaging

| Packaging Option | Packaging Specification | Quantity | Quantity & Packaging Code |
|-------------------|------------------------------------|----------|---------------------------|
| 8mm Tape and Reel | EIA-481 Rev. D (IEC 60286, part 3) | 5000 | NR |