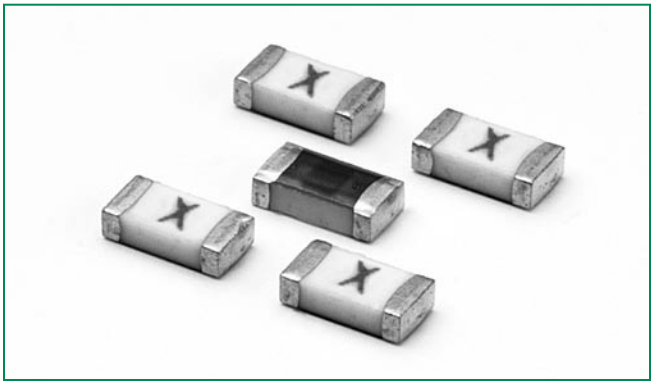
# RoHS Pb HF 440 Series, 1206 High I²t Fuse



## Agency Approvals

| AGENCY | AGENCY FILE NUMBER | AMPERE RANGE |
|---|---|---|
| | E10480 | .25A - 8A |
| | LR 29862 | .25A - 8A |

## Electrical Characteristics for Series

| % of Ampere Rating | Ampere Rating | Opening Time at 25°C |
|---|---|---|
| 100% | 0.25A - 8A | 4 hours, Minimum |
| 350% | 0.25A - 8A | 5 secs., Maximum |

## Description

The 440 Series is a 100% Lead-free, RoHS compliant and Halogen-free fuse series designed specifically to provide over-current protection to circuits that operate under high working ambient temperatures up to 150°C and high inrush currents.

The general design ensures excellent temperature stability and performance reliability.

This high I²t fuse series is designed to have ultra high inrush current withstand capability to avoid nuisance fuse open.

## Features

- Operating Temperature from -55°C to +150°C
- 100% Lead-free, RoHS compliant and Halogen-free
- Suitable for both leaded and lead-free reflow / wave soldering
- Ultra high I²t values

## Applications

- Automotive Electronics
- LCD Displays
- Servers
- Notebook Computers
- Printers
- Scanners
- Data Modems
- Hard Disk Drives

## Electrical Specifications by Item

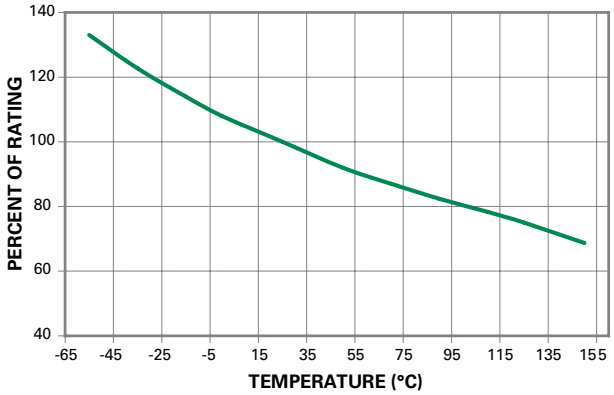
| Ampere Rating (A) | Amp Code | Max. Voltage Rating (V) | Interrupting Rating (AC/DC)[1] | Nominal Resistance (Ohms)[2] | Nominal Melting I²t (A²Sec.)[3] | Nominal Voltage Drop At Rated Current (V)[4] | Nominal Power Dissipation At Rated Current (W) | Agency Approvals | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | |
| 0.25 | .250 | 125 | 50 A @ 125 V AC/DC | 2.140 | 0.00649 | 0.5260 | 0.132 | x | X |
| 0.375 | .375 | 125 | | 1.216 | 0.01455 | 0.4993 | 0.187 | x | X |
| 0.5 | .500 | 63 | 50 A @ 63 V AC/DC | 0.8140 | 0.02642 | 0.4831 | 0.242 | x | X |
| 0.75 | .750 | 63 | 50 A @ 63 V AC/DC | 0.4624 | 0.09312 | 0.3983 | 0.299 | x | X |
| 1 | 001. | 50 | 50 A @ 50 V DC 50 A @ 50 V AC | 0.3096 | 0.21054 | 0.3457 | 0.346 | x | X |
| 1.25 | 1.25 | 50 | | 0.2268 | 0.40200 | 0.3240 | 0.405 | x | X |
| 1.5 | 01.5 | 50 | | 0.1759 | 0.50652 | 0.3215 | 0.482 | x | X |
| 1.75 | 1.75 | 32 | 50 A @ 32 V AC/DC | 0.04518 | 0.3312 | 0.0777 | 0.136 | x | X |
| 2 | 002. | 32 | | 0.03802 | 0.4326 | 0.0792 | 0.158 | x | X |
| 2.5 | 02.5 | 32 | | 0.02850 | 0.8191 | 0.0747 | 0.187 | x | X |
| 3 | 003. | 32 | | 0.02252 | 1.232 | 0.0742 | 0.223 | x | X |
| 3.5 | 03.5 | 32 | | 0.01845 | 1.789 | 0.0757 | 0.265 | x | X |
| 4 | 004. | 32 | | 0.01553 | 2.601 | 0.0709 | 0.284 | x | X |
| 5 | 005. | 32 | | 0.01164 | 4.761 | 0.0654 | 0.327 | x | X |
| 7 | 007. | 32 | | 0.00753 | 8.464 | 0.0696 | 0.487 | x | X |
| 8 | 008. | 32 | | 0.00634 | 12.95 | 0.0655 | 0.524 | x | X |

Notes:
1. AC Interrupting Rating tested at rated voltage with unity power factor. DC Interrupting Rating tested at rated voltage with time constant < 0.8 msec.
2. Nominal Resistance measured with < 10% rated current.
3. Nominal Melting I²t measured at 1 msec. opening time.
4. Nominal Voltage Drop measured at rated current after temperature has stabilized.

Devices designed to carry rated current for 4 hours minimum. It is recommended that devices be operated continuously at no more than 80% rated current. See "Temperature Derating Curve" for additional derating information.
Devices designed to be mounted with marking code facing up.

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## Temperature Derating Curve




Note:

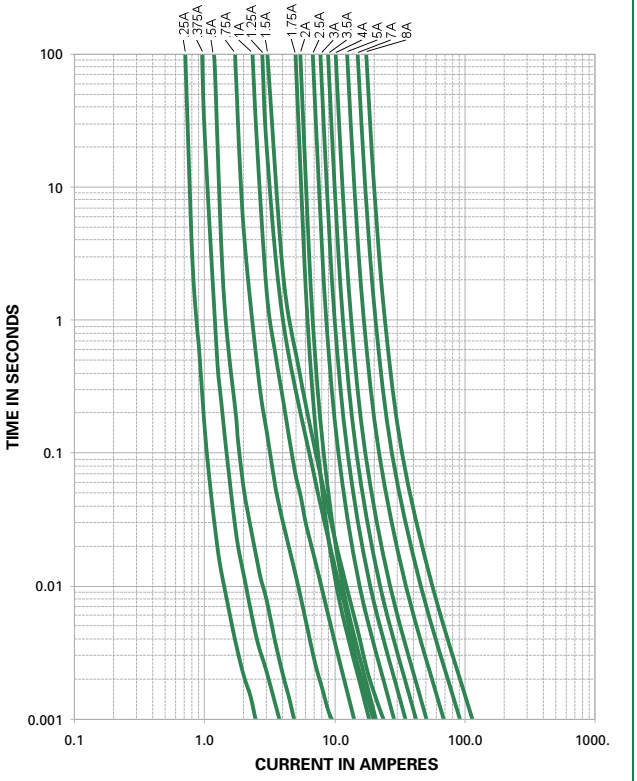
1. Derating depicted in this curve is in addition to the standard derating of 20% for continuous operation.

Example:

For continuous operation at 75 degrees celsius, the fuse should be derated as follows:

$I = (0.80)(0.85)I_{RAT} = (0.68)I_{RAT}$

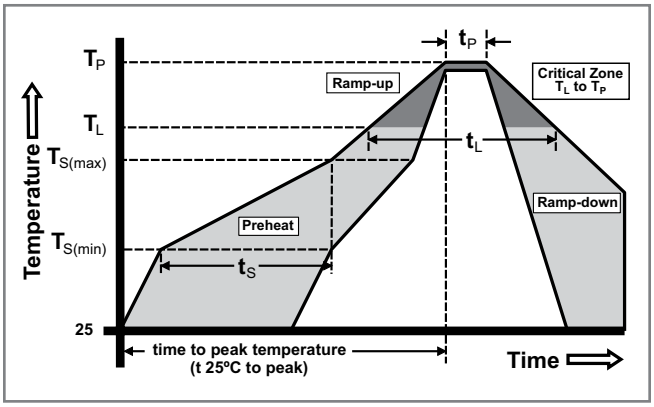
## Average Time Current Curves




## 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) | | 3°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 ($T_P$) | | $260^{+0/-5}$ °C |
| Time within 5°C of actual peak Temperature ($t_p$) | | 10 – 30 seconds |
| Ramp-down Rate | | 6°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. |
|---|---|





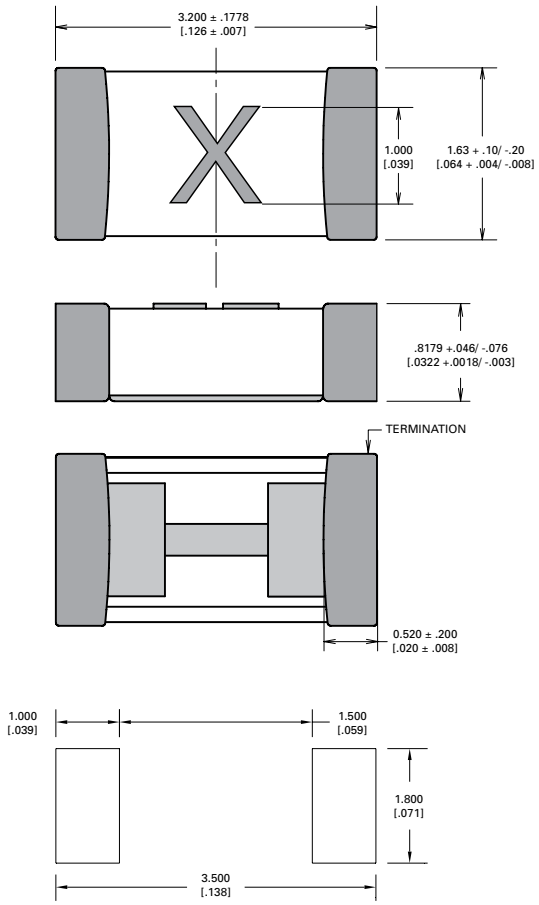
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## Product Characteristics

| | |
|---|---|
| **Materials** | **Body:** Advanced Ceramic<br>**Terminations:** Ag / Ni / Sn (100% Lead-free)<br>**Element Cover Coating:** Lead-free Glass |
| **Moisture Sensitivity Level** | IPC/JEDEC J-STD-020C, Level 1 |
| **Solderability** | IPC/ECA/JEDEC J-STD-002B, Condition C |
| **Humidity Test** | MIL-STD-202, Method 103B, Conditions D |
| **Resistance to Solder Heat** | MIL-STD-202, Method 210F, Condition B |

| | |
|---|---|
| **Moisture Resistance** | MIL-STD-202, Method 106G |
| **Thermal Shock** | MIL-STD-202, Method 107G, Condition B |
| **Mechanical Shock** | MIL-STD-202, Method 213B, Condition A |
| **Vibration** | MIL-STD-202, Method 201A |
| **Vibration, High Frequency** | MIL-STD-202, Method 204D, Condition D |
| **Dissolution of Metallization** | IPC/ECA/JEDEC J-STD-002C, Condition D |
| **Terminal Strength** | IEC 60127-4 |

## 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** |
| 007. | **W** |
| 008. | **X** |

## Part Numbering System

**0440 008. W R**

**SERIES**

**AMP CODE**

**QUANTITY CODE**
W = 3000 pcs

**PACKING CODE**
R = Reel Pack

## Packaging

| Packaging Option | Packaging Specification | Quantity | Quantity & Packaging Code |
|---|---|---|---|
| 8mm Tape and Reel | EIA-481, IEC 60286, Part 3 | 3000 | WR |



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