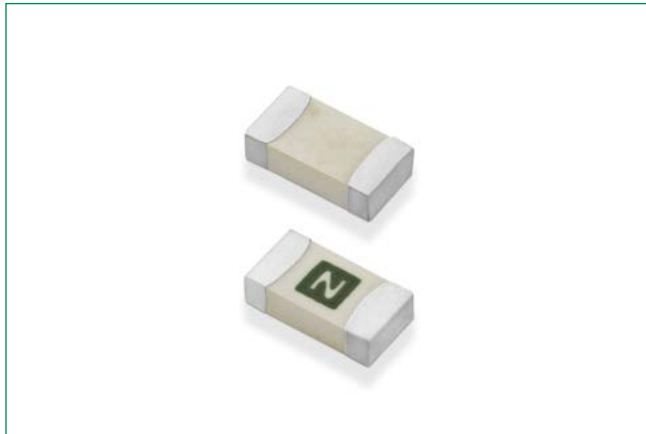


440 Series

1206 High I²t Fuse



Description

The 440 Series is a 100% RoHS Compliant, lead-free 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 and Benefits

- Operating Temperature from -55°C to +150°C
- Ultra high I²t values
- RoHS compliant, lead-free and halogen-free
- Recognized to UL/CSA/NMX 248-1 and UL/CSA/NMX 248-14
- Suitable for both leaded and lead-free reflow / wave soldering

Web Resources



Download ECAD models, order samples, and find technical resources at www.littelfuse.com

Applications

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

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 |

Agency Approvals

| Agency | Agency File Number | Ampere Range |
|--------|--------------------|--------------|
| cULUS | E10480 | 0.25A - 8A |
| SP | 29862 | 0.25A - 8A |

Electrical Specifications by Item

| Ampere Rating (A) | Amp Code | Max. Voltage Rating (V) | Interrupting Rating (AC/DC) | Nominal Resistance (Ohms) ¹ | Nominal Melting I ² t (A ² Sec.) ² | Nominal Voltage Drop At Rated Current (V) ³ | Nominal Power Dissipation At Rated Current (W) | Agency Approvals | |
|-------------------|----------|-------------------------|-----------------------------|--|---|--|--|------------------|----|
| | | | | | | | | cULUS | SP |
| 0.250 | .250 | 125 | 50 A @ 125 V AC/DC | 2.140 | 0.00649 | 0.5260 | 0.132 | X | X |
| 0.375 | .375 | 125 | | 0.1216 | 0.01455 | 0.4993 | 0.187 | X | X |
| 0.500 | .500 | 63 | 50 A @ 63 V AC/DC | 0.8384 | 0.0399 | 0.4831 | 0.242 | X | X |
| 0.750 | .750 | 63 | | 0.4624 | 0.1162 | 0.3983 | 0.299 | X | X |
| 1.00 | 001. | 50 | 50 A @ 50 VAC/DC | 0.3096 | 0.2200 | 0.3457 | 0.346 | X | X |
| 1.25 | 1.25 | 50 | | 0.2265 | 0.3900 | 0.3240 | 0.405 | X | X |
| 1.50 | 01.5 | 50 | | 0.1759 | 0.5080 | 0.3215 | 0.482 | X | X |
| 1.75 | 1.75 | 32 | | 0.0450 | 0.4000 | 0.0777 | 0.136 | X | X |
| 2.00 | 002. | 32 | | 0.0385 | 0.4700 | 0.0792 | 0.158 | X | X |
| 2.50 | 02.5 | 32 | | 0.02850 | 0.8200 | 0.0747 | 0.187 | X | X |
| 3.00 | 003. | 32 | 50 A @ 32 V AC/DC | 0.02252 | 1.2470 | 0.0742 | 0.223 | X | X |
| 3.50 | 03.5 | 32 | | 0.01845 | 2.3800 | 0.0757 | 0.265 | X | X |
| 4.00 | 004. | 32 | | 0.01553 | 3.136 | 0.0709 | 0.284 | X | X |
| 5.00 | 005. | 32 | | 0.0120 | 5.949 | 0.0654 | 0.327 | X | X |
| 7.00 | 007. | 32 | | 0.00753 | 10.38 | 0.0696 | 0.487 | X | X |
| 8.00 | 008. | 32 | | 0.00634 | 13.03 | 0.0655 | 0.524 | X | X |

Notes:

1. Nominal Resistance measured with < 10% rated current.
2. Contact Littelfuse if application transient surges are less than 1 ms.
3. Nominal Voltage Drop measured at rated current after temperature has stabilized.

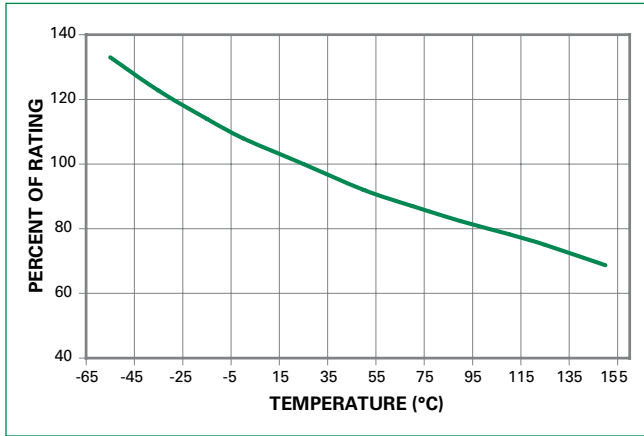
Devices designed to carry rated current for 4 hours minimum. It is recommended that devices be operated continuously at no more than 80% rated current. See "Temperature Derating Curve" for additional derating information.

Devices designed to be mounted with marking code facing up.

440 Series

1206 High I²t Fuse

Temperature Derating Curve



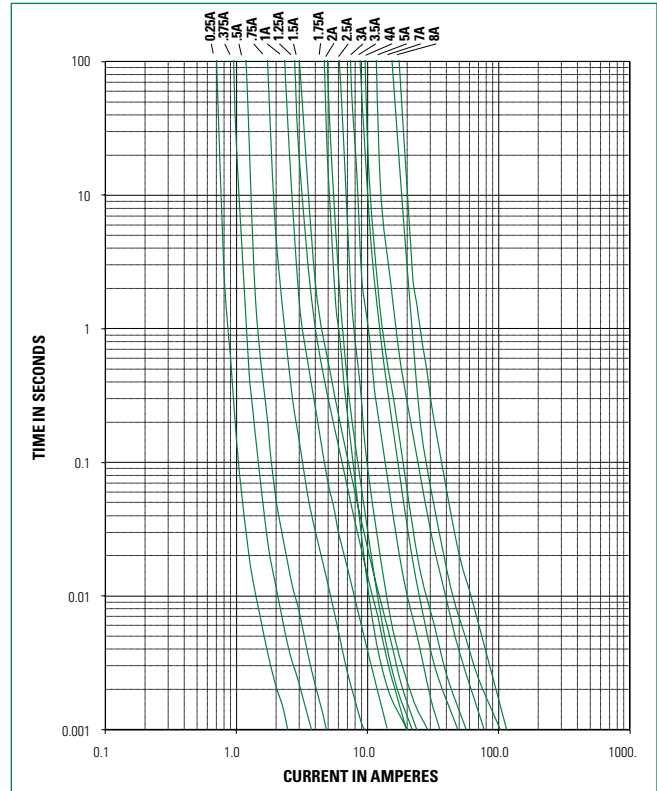
Note:

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:
 $I = (0.80)(0.85)_{75} = (0.68)_{75}$

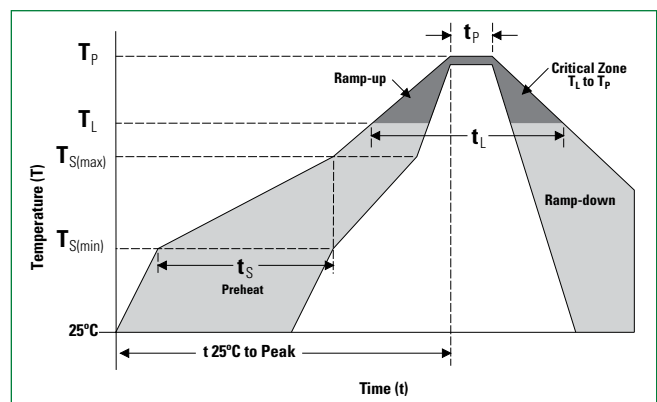
Average Time Current Curves



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. |
|-----------------------|------------------------|



440 Series

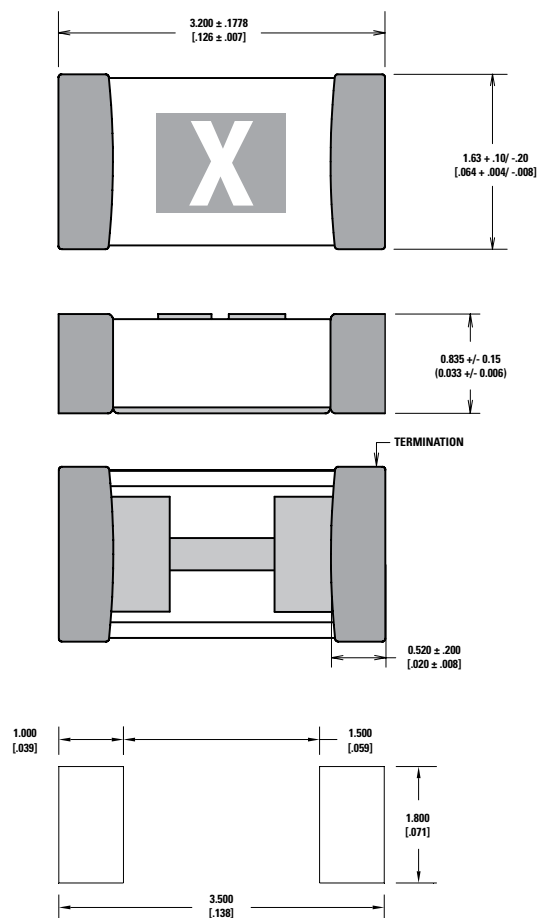
1206 High I²t Fuse

Product Characteristics

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

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

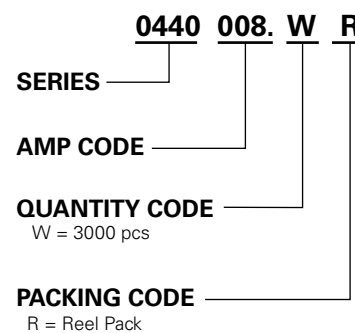
Dimensions mm (inches)



Part Marking System

| Amp Code | Marking Code | Amp Code | Marking Code |
|----------|--------------|----------|--------------|
| .250 | D | 002. | N |
| .375 | E | 02.5 | O |
| .500 | F | 003. | P |
| .750 | G | 03.5 | R |
| 001. | H | 004. | S |
| 1.25 | J | 005. | T |
| 01.5 | K | 007. | W |
| 1.75 | L | 008. | X |

Part Numbering System



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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