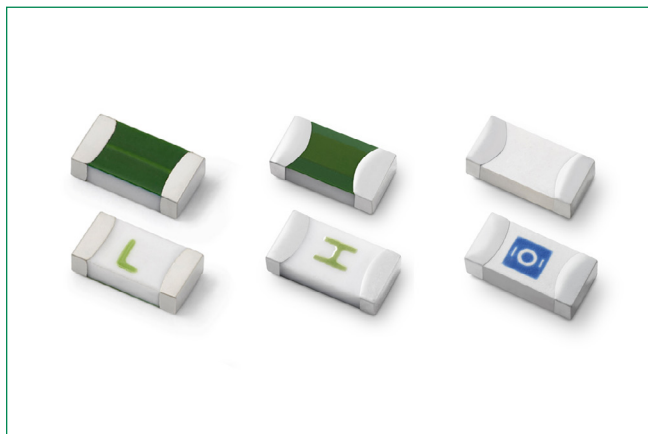


# 437A Series

## 1206 Fast-Acting Ceramic Fuse



### Additional Information



Resources



Accessories



Samples

### Electrical Characteristics for Series

| % of Ampere Rating | Ampere Rating   | Opening Time at 25°C |
|--------------------|-----------------|----------------------|
| 100%               | 0.250A – 8A     | 4 hours, Minimum     |
| 250%               | 0.750A – 8A     | 5 seconds, Maximum   |
| 350%               | 0.750A – 8A     | 1 second, Maximum    |
|                    | 0.250A - 0.500A | 5 seconds, Maximum   |

### Description

The 437A Series AECQ-Compliant fuses are specifically tested to cater to secondary circuit protection needs of compact auto-electronics applications.

The general design ensures excellent temperature stability and performance reliability. In addition to this, the high  $I^2t$  values typical of the Littelfuse Ceramic Fuse family ensure high inrush current withstand capability.

### Features

- Operating Temperature from -55°C to +150°C
- 100% Lead-free, Halogen-Free and RoHS compliant
- Meets Littelfuse's automotive qualifications\*
- Fast response to faulty current to ensure over-current protection for sensitive electronic components

\* - Largely based on Littelfuse internal AEC-Q200 test plan.

### Applications

- Li-ion Battery
- LED Lighting
- Automotive Navigation System
- TFT Display
- Battery Management System (BMS)
- Clusters

### Agency Approvals

| Agency | Agency File Number | Ampere Range |
|--------|--------------------|--------------|
| cULUS  | E10480             | 0.250A – 8A  |
| SPC    | 29862              | 0.250A – 8A  |

### Electrical Specifications by Item

| Ampere Rating (A) | Amp Code | Max. Voltage Rating (V) | Interrupting Rating <sup>1</sup>                 | Nominal Resistance (Ohms) <sup>2</sup> | Nominal Melting $I^2t$ (A <sup>2</sup> Sec.) <sup>3</sup> | Nominal Voltage Drop At Rated Current (V) <sup>4</sup> | Nominal Power Dissipation At Rated Current (W) | Agency Approvals |     |
|-------------------|----------|-------------------------|--------------------------------------------------|----------------------------------------|-----------------------------------------------------------|--------------------------------------------------------|------------------------------------------------|------------------|-----|
|                   |          |                         |                                                  |                                        |                                                           |                                                        |                                                | cULUS            | SPC |
| 0.250             | .250     | 125                     | 50A @ 125VAC/DC                                  | 2.290                                  | 0.003                                                     | 0.78                                                   | 0.195                                          | x                | x   |
| 0.375             | .375     | 125                     |                                                  | 1.330                                  | 0.010                                                     | 0.60                                                   | 0.225                                          | x                | x   |
| 0.500             | .500     | 63                      | 50A @ 63VAC/DC<br>50A @ 63VAC/DC<br>100A @ 63VDC | 0.908                                  | 0.018                                                     | 0.52                                                   | 0.260                                          | x                | x   |
| 0.750             | .750     | 63                      |                                                  | 0.600                                  | 0.064                                                     | 0.45                                                   | 0.338                                          | x                | x   |
| 1.00              | 001.     | 63                      | 50A @ 63VAC/DC                                   | 0.420                                  | 0.100                                                     | 0.41                                                   | 0.410                                          | x                | x   |
| 1.25              | 1.25     | 63                      |                                                  | 0.318                                  | 0.256                                                     | 0.40                                                   | 0.500                                          | x                | x   |
| 1.50              | 01.5     | 63                      |                                                  | 0.209                                  | 0.324                                                     | 0.39                                                   | 0.585                                          | x                | x   |
| 1.75              | 1.75     | 63                      |                                                  | 0.071                                  | 0.075                                                     | 0.27                                                   | 0.473                                          | x                | x   |
| 2.00              | 002.     | 63                      |                                                  | 0.062                                  | 0.144                                                     | 0.20                                                   | 0.400                                          | x                | x   |
| 2.50              | 02.5     | 63                      | 50A @ 45VAC/63VDC                                | 0.043                                  | 0.441                                                     | 0.15                                                   | 0.375                                          | x                | x   |
| 3.00              | 003.     | 63                      |                                                  | 0.035                                  | 0.506                                                     | 0.14                                                   | 0.420                                          | x                | x   |
| 3.50              | 03.5     | 63                      |                                                  | 0.027                                  | 0.777                                                     | 0.13                                                   | 0.455                                          | x                | x   |
| 4.00              | 004.     | 63                      |                                                  | 0.022                                  | 1.024                                                     | 0.13                                                   | 0.520                                          | x                | x   |
| 5.00              | 005.     | 63                      |                                                  | 0.0159                                 | 2.30                                                      | 0.13                                                   | 0.650                                          | x                | x   |
| 7.00              | 007.     | 35                      | 50A @ 32VAC/35VDC                                | 0.0100                                 | 5.02                                                      | 0.13                                                   | 0.910                                          | x                | x   |
| 8.00              | 008.     | 35                      |                                                  | 0.008                                  | 7.23                                                      | 0.13                                                   | 1.040                                          | x                | x   |

#### Notes:

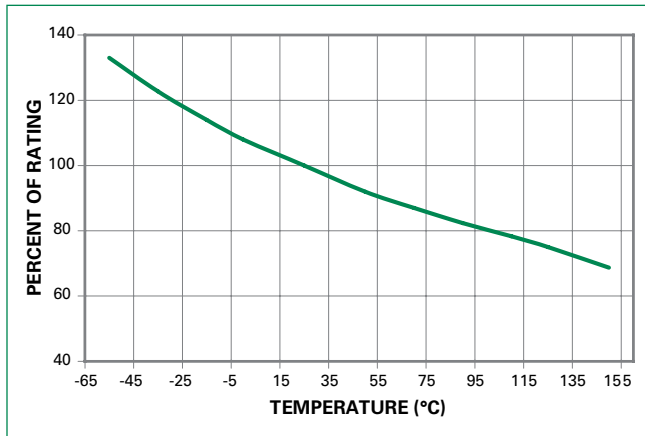
1. AC Interrupting Rating tested at rated voltage with unity power factor. DC Interrupting Rating tested at rated voltage with time constant < 0.8 msec.
2. Nominal Resistance measured with < 10% rated current.
3. Nominal Melting  $I^2t$  measured at 1 msec. opening time.
4. Nominal Voltage Drop measured 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 Re-rating Curve" for additional re-rating information. Devices designed to be mounted with marking code facing up.

# 437A Series

## 1206 Fast-Acting Ceramic Fuse

### Temperature Re-rating Curve



#### Note:

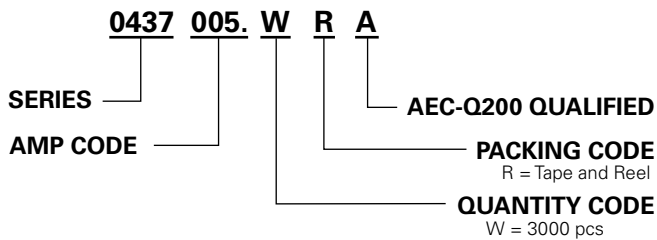
- Re-rating depicted in this curve is in addition to the standard re-rating of 20% for continuous operation.

#### Example:

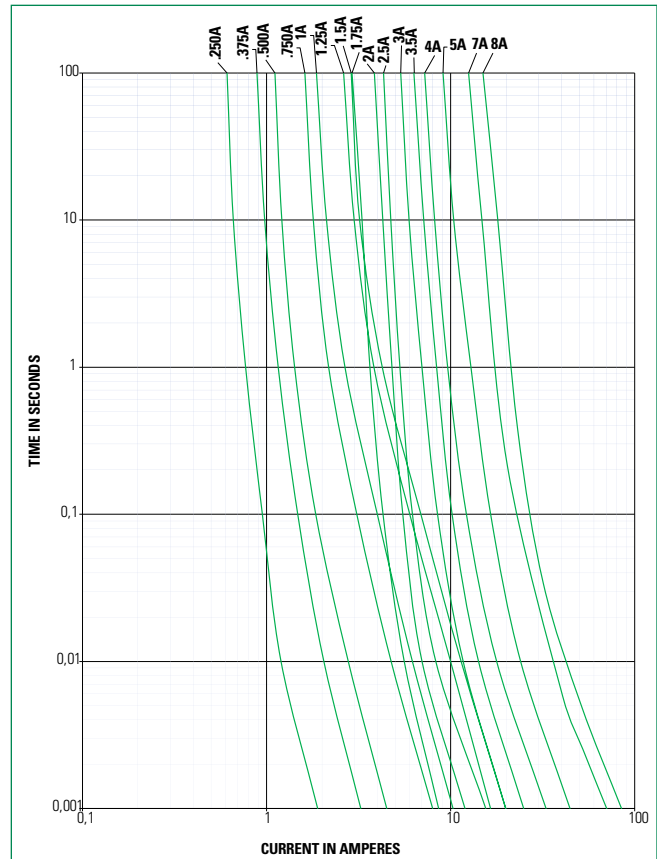
For continuous operation at 75 degrees celsius, the fuse should be rerated as follows:

$$I = (0.80)(0.85)_{\text{RAT}} = (0.68)_{\text{RAT}}$$

### Part Numbering System

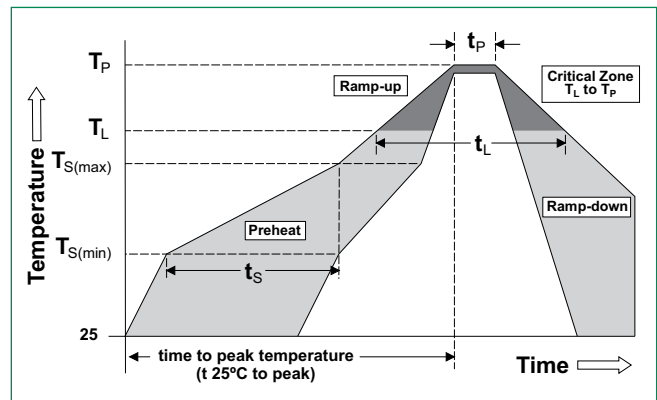


### Average Time Current Curves



### 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.        |
| <b><math>T_{s(\max)}</math> to <math>T_L</math> - Ramp-up Rate</b>     |                                     | 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 $\pm$ 0/5 °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                  |
| <b>Wave Soldering</b>                                                  |                                     | 260°C, 10 seconds max. |



# 437A Series

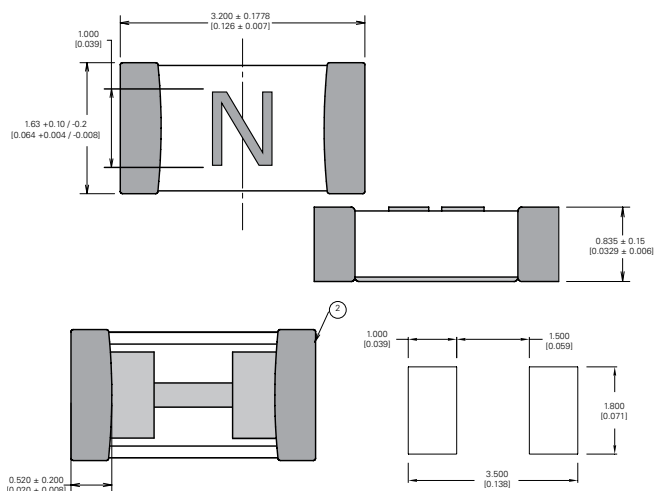
## 1206 Fast-Acting Ceramic Fuse

### Product Characteristics

|                                     |                                                                                                                                  |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| <b>Materials</b>                    | <b>Body:</b> Advanced Ceramic<br><b>Terminations:</b> Ag/Ni/Sn (100% Lead-free)<br><b>Element Cover Coating:</b> Lead-free Glass |
| <b>Moisture Sensitivity Level</b>   | IPC/JEDEC J-STD-020, Level 1                                                                                                     |
| <b>Solderability</b>                | IPC/EIC/JEDEC J-STD-002, Condition B                                                                                             |
| <b>Humidity Test</b>                | MIL-STD-202, Method 103, Conditions D                                                                                            |
| <b>Resistance to Solder Heat</b>    | MIL-STD-202, Method 210, Condition B                                                                                             |
| <b>Moisture Resistance</b>          | MIL-STD-202, Method 106                                                                                                          |
| <b>Thermal Shock</b>                | MIL-STD-202, Method 107, Condition B                                                                                             |
| <b>Mechanical Shock</b>             | MIL-STD-202, Method 213, Condition A                                                                                             |
| <b>Vibration</b>                    | MIL-STD-202, Method 201                                                                                                          |
| <b>Vibration, High Frequency</b>    | MIL-STD-202, Method 204, Condition D                                                                                             |
| <b>Dissolution of Metallization</b> | IPC/EIC/JEDEC J-STD-002, Condition D                                                                                             |
| <b>Terminal Strength</b>            | IEC 60127-4                                                                                                                      |

|                                     |                                                                           |
|-------------------------------------|---------------------------------------------------------------------------|
| <b>High Temperature Storage</b>     | MIL-STD-202 Method 108 with exemptions                                    |
| <b>Thermal Shock Test</b>           | JESD22 Method JA-104, Test Conditions B and N                             |
| <b>Biased Humidity</b>              | MIL-STD-202 Method 103, 85°C/85% RH with 10% operating power for 1000 hrs |
| <b>Operational Life</b>             | MIL-STD-202 Method 108, Test Condition D                                  |
| <b>Resistance To Solvents</b>       | MIL-STD-202 Method 215                                                    |
| <b>Mechanical Shock</b>             | MIL-STD-202 Method 213, Test Condition C                                  |
| <b>High Frequency Vibration</b>     | MIL-STD-202, Method 204                                                   |
| <b>Resistance To Soldering Heat</b> | MIL-STD-202 Method 210, Test Condition B                                  |
| <b>Solderability</b>                | JESD22-B102E Method 1                                                     |
| <b>Terminal Strength For SMD</b>    | AEC Q200-006                                                              |
| <b>Board Flex</b>                   | AEC Q200-005                                                              |
| <b>Electrical Characterization</b>  | 3 Temperature Electrical Characterization                                 |

### 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     | <u>Q</u>     |
| 003.     | P            |
| 3.500    | R            |
| 004.     | S            |
| 005.     | T            |
| 007.     | W            |
| 008.     | X            |

### Packaging

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

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[043701.5WRA](#) [04371.25WRA](#) [043703.5WRA](#) [0437.750WRA](#) [0437005.WRA](#) [0437007.WRA](#) [0437008.WRA](#)  
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