

Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from Europe, America and south Asia, supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts, Customers Priority, Honest Operation, and Considerate Service", our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip, ALPS, ROHM, Xilinx, Pulse, ON, Everlight and Freescale. Main products comprise IC, Modules, Potentiometer, IC Socket, Relay, Connector. Our parts cover such applications as commercial, industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



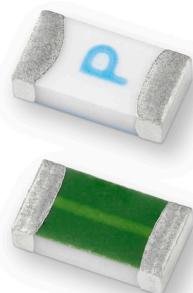
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### 440A Series, 1206 High $I^2t$ Fuse



#### Agency Approvals

AGENCY	AGENCY FILE NUMBER	AMPERE RANGE
	E10480	0.500A - 8A
	29862	0.500A - 8A

#### Electrical Characteristics for Series

% of Ampere Rating	Ampere Rating	Opening Time at 25°C
100%	.50A - .75A 1.75A - 8A	4 hours, Minimum
350%	.50A - .75A 1.75A - 8A	5 secs., Maximum

#### Electrical Specifications by Item

Ampere Rating (A)	Amp Code	Max. Voltage Rating (V)	Interrupting Rating (AC/DC) <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	
0.5	.500	63	50A @ 63VAC/DC	0.8140	0.02642	0.4831	0.242	x	x
0.75	.750	63	50A @ 63VAC/DC	0.4624	0.09312	0.3983	0.299	x	x
1.75	1.75	32	50A @ 32VAC/DC	0.0450	0.3312	0.0777	0.136	x	x
2	002.	32		0.0385	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		0.0120	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  $I^2t$  measured at 1msec. opening time.
4. Nominal Voltage Drop measured at rated current after temperature has stabilized.

#### Description

The 440A 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. This high  $I^2t$  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
- Meets Littelfuse's automotive qualifications\*
- Ultra high  $I^2t$  values
- Fast response to faulty current to ensure over-current protection to sensitive electronic component

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

#### Applications

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

#### Additional Information



Datasheet



Resources

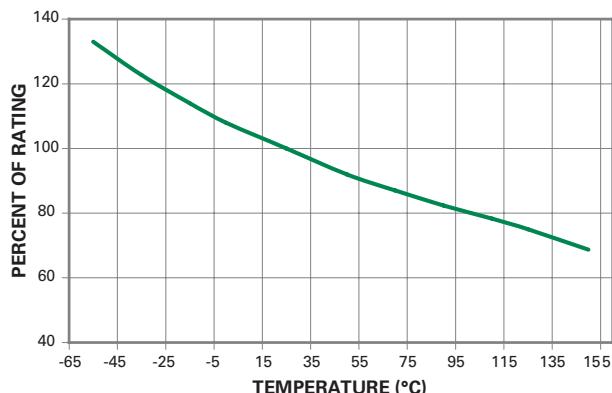


Samples

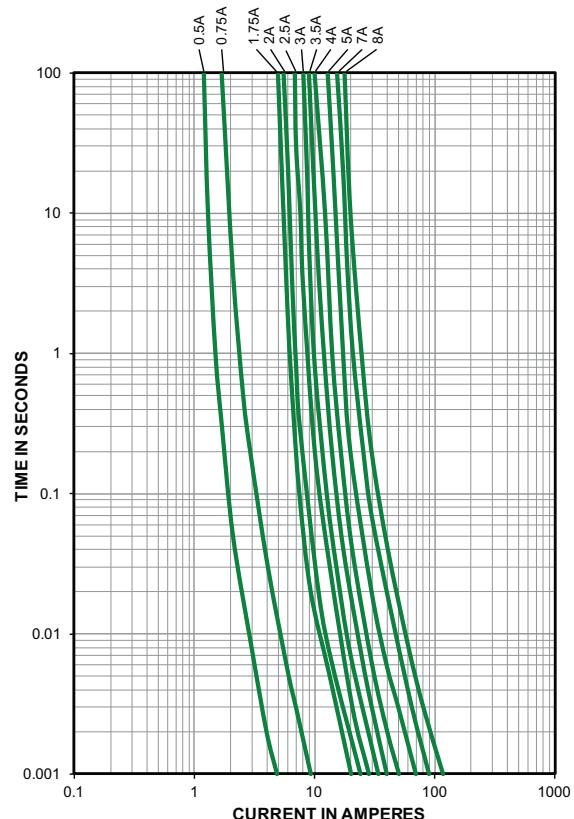
Devices designed to carry rated current for 4 hours minimum. It is recommended that devices be operated continuously at no more than 80% rated current. See "Temperature Derating Curve" for additional derating information.

Devices designed to be mounted with marking code facing up.

### Temperature Rerating Curve



### Average Time Current Curves



Note:

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

Example:

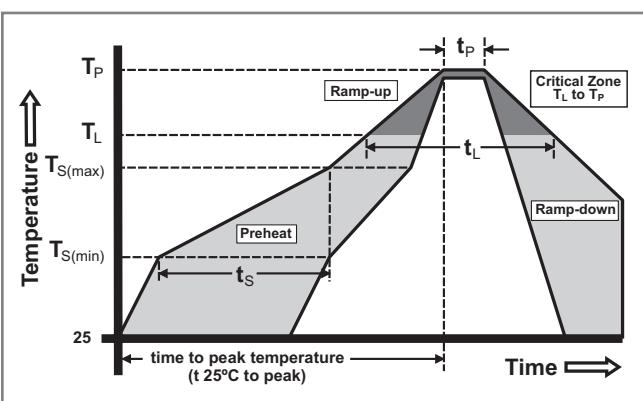
For continuous operation at 75 degrees celsius, the fuse should be derated as follows:

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

### 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 <sup>+0/-5</sup> °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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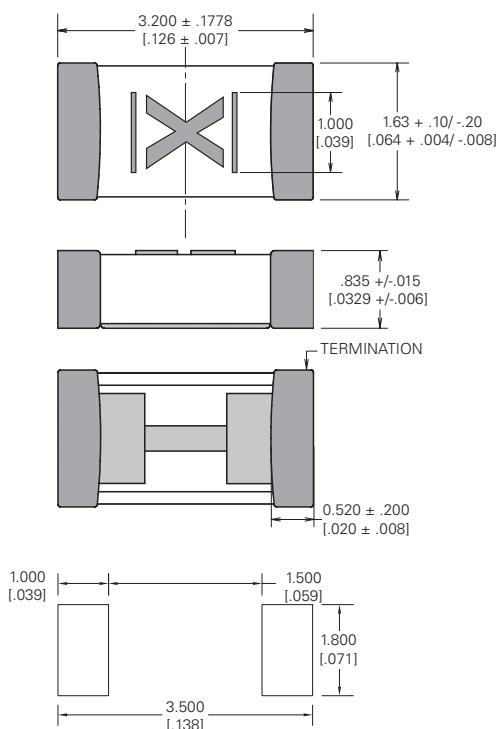


### Product Characteristics

<b>Materials</b>	<b>Body:</b> Advanced Ceramic <b>Terminations:</b> Ag / Ni / Sn (100% Lead-free) <b>Element Cover Coating:</b> Lead-free Glass
<b>Moisture Sensitivity Level</b>	IPC/JEDEC J-STD-020, Level 1
<b>Solderability</b>	IPC/ECA/JEDEC J-STD-002, Condition C
<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/ECA/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, 85C/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

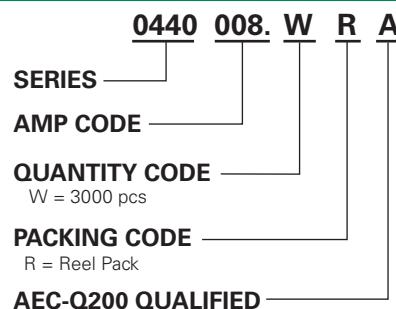
### Dimensions



### Part Marking System

Amp Code	Marking Code
.500	<b>F</b>
.750	<b>G</b>
1.75	<b>L</b>
002.	<b>N</b>
02.5	<b>O</b>
003.	<b>P</b>
03.5	<b>R</b>
004.	<b>S</b>
005.	<b>T</b>
007.	<b>W</b>
008.	<b>X</b>

### Part Numbering System



### Packaging

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