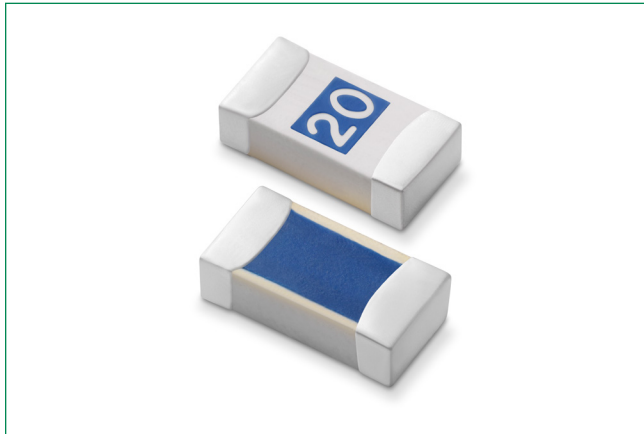


# 501A Series

## AEC-Q200 Qualified > High Current 1206 Fast-Acting Fuse



### Description

The 501A series AEC-Qualified fuses and Halogen free fuse series are specifically tested to cater to secondary circuit protection needs of compact auto electronics application.

The general design ensures excellent temperature stability and performance reliability. The high I<sup>2</sup>t values which are typical in the Littelfuse Ceramic Fuse family, ensure high inrush current withstanding capability.

### Features & Benefits

- 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
- Recognized to UL/CSA/NMX 248-1 and UL/CSA/NMX 248-14
- AEC-Q200 Qualified

### Additional Information



Resources



Accessories



Samples

### Agency Approvals

Agency	Agency File Number	Ampere Range
	E10480	10A - 20A
	29862	10A - 20A

### Applications

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

### Electrical Characteristics for Series

% of Ampere Rating	Ampere Rating	Opening Time at 25°C
100%	10A – 20A	4 Hours, Minimum
350%	10A – 20A	5 Seconds, Maximum

### Electrical Specifications by Item

Ampere Rating (A)	Amp Code	Max. Voltage Rating (V)	Interrupting Rating (DC) <sup>1</sup>	Nominal Resistance (Ohms) <sup>2</sup>	Nominal Melting I <sup>2</sup> t (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	
10	010.	32	150A @ 32VDC	0.00362	10.385	0.04407	0.4407	x	x
12	012.	32		0.00311	20.341	0.04927	0.5912	x	x
15	015.	32		0.00250	39.700	0.04843	0.7265	x	x
20	020.	32		0.00194	86.360	0.05888	1.1776	x	x

#### Notes:

- DC Interrupting Rating tested at rated voltage with time constant <0.5msec.
- Nominal Resistance measured with <10% rated current.
- Nominal Melting I<sup>2</sup>t measured at 1 msec. opening time. For other I<sup>2</sup>t data refer to chart.
- Nominal Voltage Drop measured at rated current after temperature has stabilized and with fuse mounted on board with 3oz Cu trace.

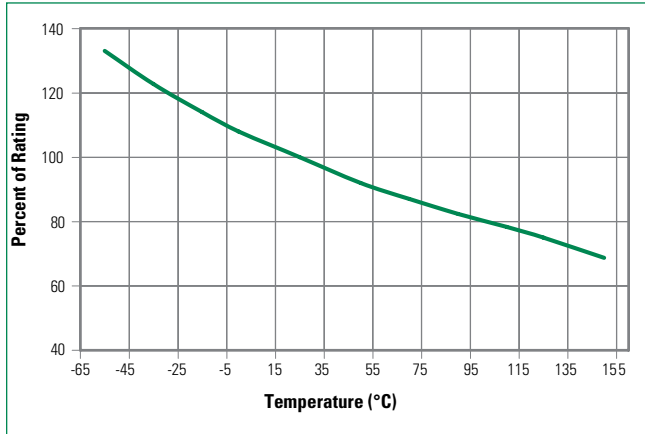
Devices designed to carry rated current for four hours minimum. It is recommended that devices be operated continuously at no more than 80% rated current. See "Temperature Re-rating Curve" for additional re-rating information.

Devices designed to be mounted with marking code facing up.

# 501A Series

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Temperature Re-rating Curve



**Note:**

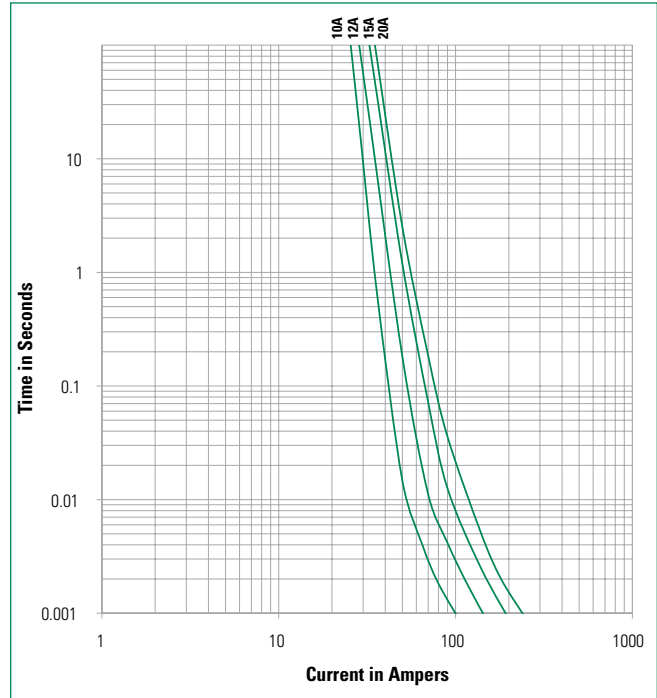
1. Re-rating depicted in this curve is in addition to the standard re-rating of 20% for continuous operation.

**Example:**

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

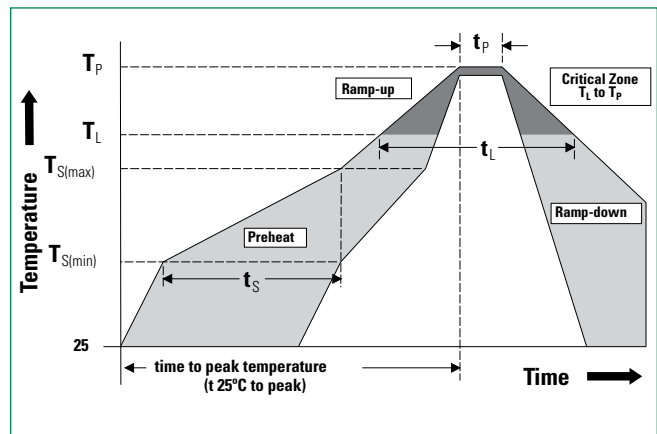
$$I = (0.80)(0.85)I_N = (0.68)I_N$$

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>		3°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 <sup>+0/-5</sup> °C
<b>Time within 5°C of actual peak Temperature (<math>t_p</math>)</b>		10 – 30 seconds
<b>Ramp-down Rate</b>		6°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.	



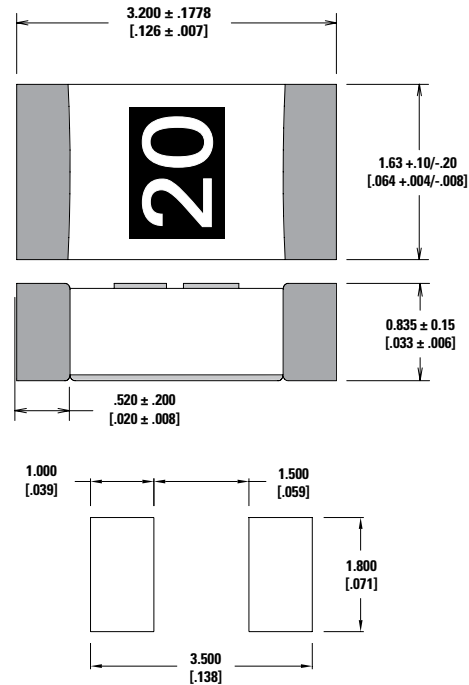
# 501A Series

## AEC-Q200 Qualified > High Current 1206 Fast-Acting Fuse

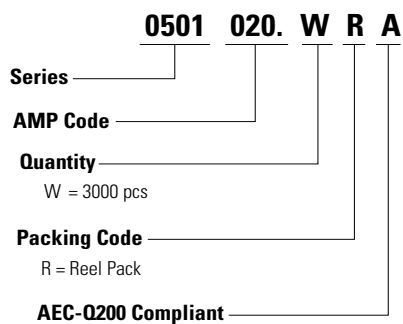
### Product Characteristics

<b>Materials</b>	Body: Advanced Ceramic Terminations: Ag / Ni / Sn (100% Lead-free) Element Cover Coating: 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>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 1000hrs
<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>	Conducted at minimum, ambient and maximum temperatures

### Dimensions mm (in.)



### Part Numbering System



### Part Marking System

Amp Code	Marking Code
010.	<b>10</b>
012.	<b>12</b>
015.	<b>15</b>
020.	<b>20</b>

### Packaging

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

**Disclaimer Notice** - Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at [www.littelfuse.com/disclaimer-electronics](http://www.littelfuse.com/disclaimer-electronics).