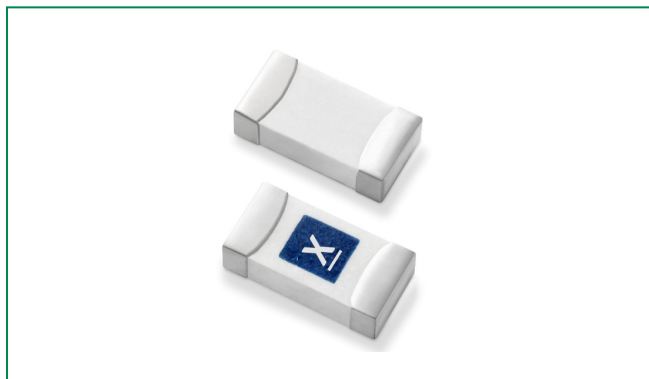


## 407A Series – 1206 Time-Lag Fuse



### Agency Approvals

AGENCY	AGENCY FILE NUMBER	AMPERE RANGE
US	E10480	1A – 8A

### Electrical Characteristics

% of Ampere Rating	Ampere Rating	Opening Time at 25°C
100%	1A – 8A	4 hours Minimum
200%	1A – 8A	1 sec Min; 120 secs Max
300%	1A – 8A	0.1 sec Min; 3 secs Max
800%	1A – 8A	0.002 sec Min; 0.05 secs Max

### Additional Information



Datasheet



Resources



Samples

### Description

The 407A 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<sup>2</sup>t 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 I<sup>2</sup>t values
- Meets Littelfuse's automotive qualifications\*

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

### Benefits

- Avoids nuisance opening due to high inrush and surge current inherent in the system
- High current ratings in small size

### Applications

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

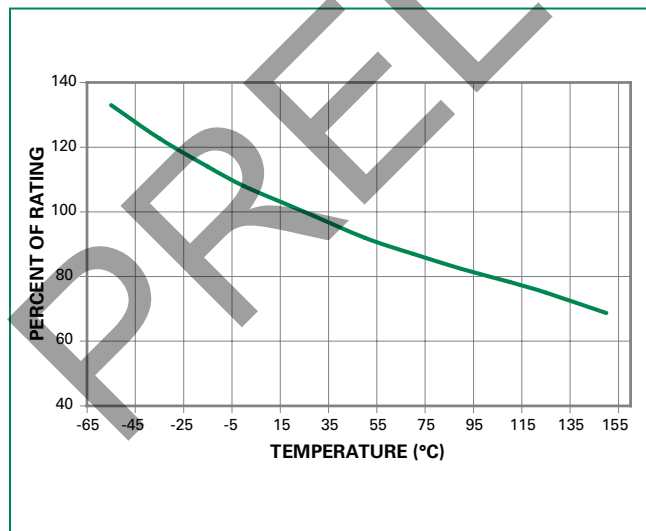
### Electrical Specifications by Item

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 <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 Approval
1.00	001.	63	50A@63VDC	0.360	0.142	0.456	0.456	x
1.25	1.25	63		0.200	0.329	0.404	0.500	x
1.50	01.5	63		0.180	0.567	0.347	0.525	x
2.00	002.	63		0.100	0.870	0.323	0.640	x
2.50	02.5	32	50A@32VDC	0.055	1.000	0.252	0.625	x
3.00	003.	32		0.040	1.300	0.187	0.570	x
3.50	03.5	32		0.030	2.260	0.153	0.525	x
4.00	004.	32		0.025	4.180	0.142	0.560	x
4.50	04.5	32		0.020	5.200	0.134	0.585	x
5.00	005.	32		0.016	7.800	0.133	0.650	x
5.50	05.5	24	50A@24VDC	0.014	8.550	0.130	0.715	x
6.00	006.	24	60A@24VDC	0.012	15.560	0.128	0.780	x
7.00	007.	24		0.010	16.230	0.110	0.770	x
8.00	008.	24		0.009	24.120	0.097	0.800	x

#### Note:

- AC Interrupting Rating tested at rated voltage with unity power factor. DC Interrupting Rating tested at rated voltage with time constant < 0.8 msec.
  - Nominal Resistance measured with < 10% rated current.
  - Nominal Melting I<sup>2</sup>t measured at 1msec. opening time.
  - 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.

### Temperature Re-rating Curve



#### Note:

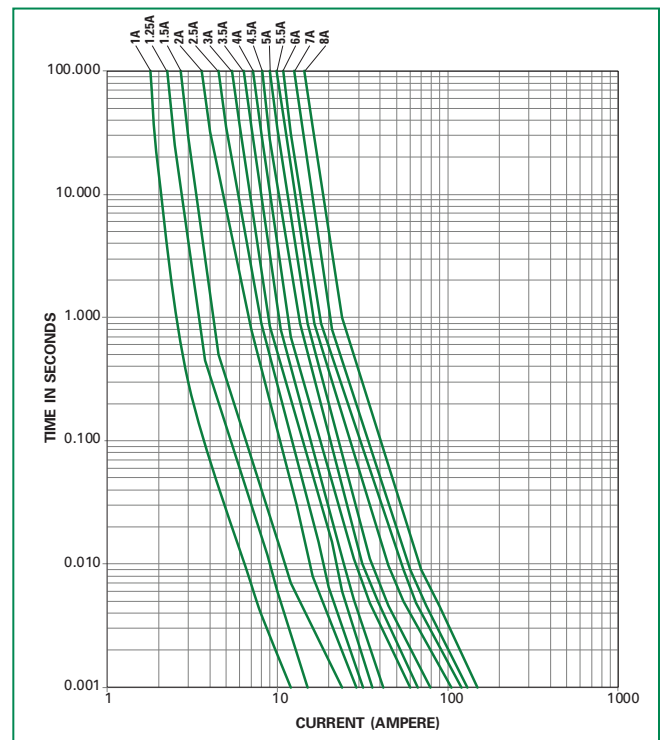
Re-rating depicted in this curve is in addition to the standard re-rating of 20% for continuous operation.

#### Example:

For continuous operation at 75° C, the fuse should be rerated as follows:

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

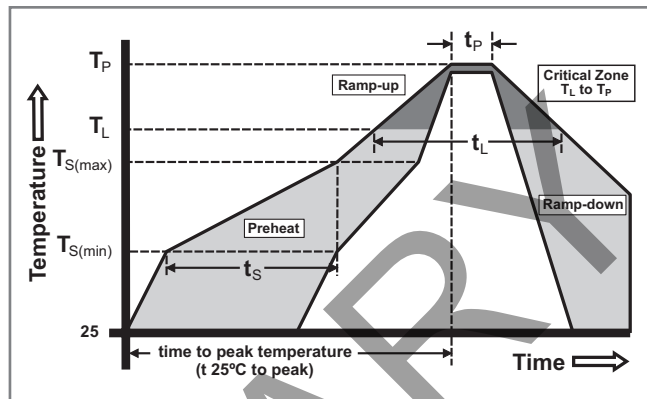
### Average Time Current Curves



## 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 <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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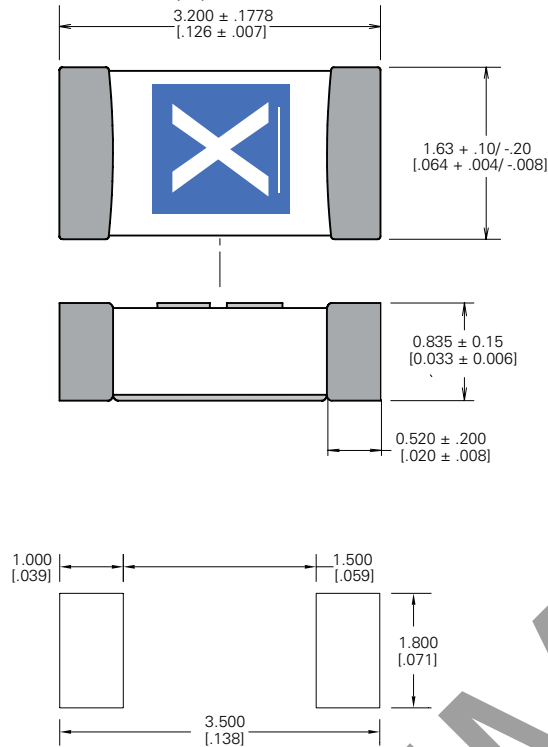
## Product Characteristics

<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

All dimensions in mm (in)



### Part Marking System

Amp Code	Marking Code	Amp Code	Marking Code
001.	<b>H</b>	004.	<b>S</b>
1.25	<b>J</b>	04.5	<b>S.</b>
01.5	<b>K</b>	005.	<b>T</b>
002.	<b>N</b>	05.5	<b>U</b>
02.5	<b>Q</b>	006.	<b>V</b>
003.	<b>P</b>	007.	<b>W</b>
03.5	<b>R</b>	008.	<b>X</b>

### Part Numbering System

<b>0407</b>	<b>008.</b>	<b>W</b>	<b>R</b>	<b>A</b>	<b>AEC-Q200 COMPLIANT</b>
<b>SERIES</b>					
<b>AMP CODE</b> Refer to Electrical Characteristics Table					
		<b>PACKING CODE</b> R = Reel pack			
		<b>QUANTITY CODE</b> W = 3000 pieces			

### Packaging

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

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