

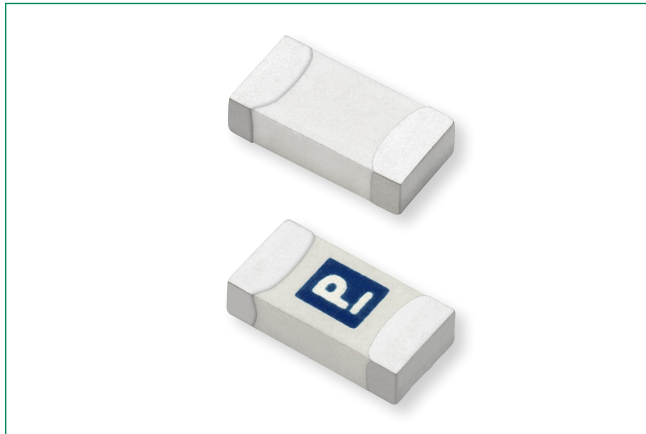


**THE DATASHEET OF**  
**0407008.WRA**



# 407A Series

## AEC-Q200 Qualified > Ceramic Fuse



### Additional Information



Resources



Accessories



Samples

### Electrical Characteristics

% of Ampere Rating	Opening Time
100%	4 Hours, Min.
200%	1 Sec. Min.; 120 Secs. Max.
300%	0.1 Sec. Min.; 3 Secs. Max.
800%	0.002 Sec. Min.; 0.05 Sec. Max.

### Description

The 407A Series AEC-Qualified fuse is 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 & 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
- UL Recognized to UL/CSA/NMX 248-1 and UL/CSA/NMX 248-14
- Ultra-high I<sup>2</sup>t values
- Avoids nuisance opening due to high inrush and surge current inherent in the system
- High current ratings in small size
- AEC-Q200 Qualified

### Applications

- Li-ion battery
- LED lighting
- Automotive navigation system
- TFT display
- Battery Management System (BMS)
- Infotainment

### Agency Approvals

Agency	Agency File/Certificate Number	Ampere Range
	E10480	1 A–8 A

### Electrical Specifications

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	50A@24VDC	0.016	7.800	0.133	0.650	x
5.50	05.5	24		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

#### Notes

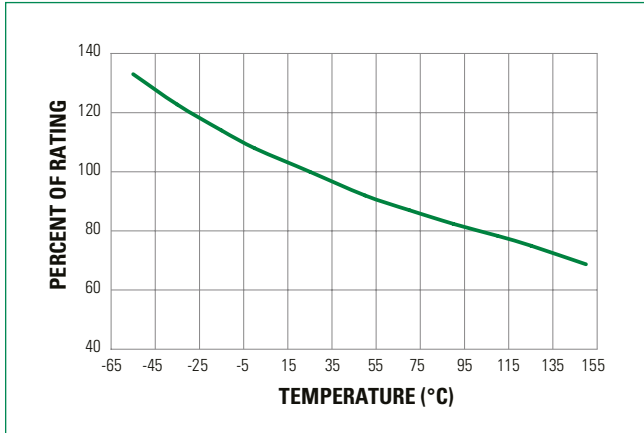
1. AC Interrupting Rating tested at rated voltage with unity power factor. DC Interrupting Rating tested at rated voltage with time constant < 0.8 msec.
2. Nominal Resistance measured with < 10% rated current.
3. Nominal Melting I<sup>2</sup>t measured at 1msec. opening time.
4. Nominal Voltage Drop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

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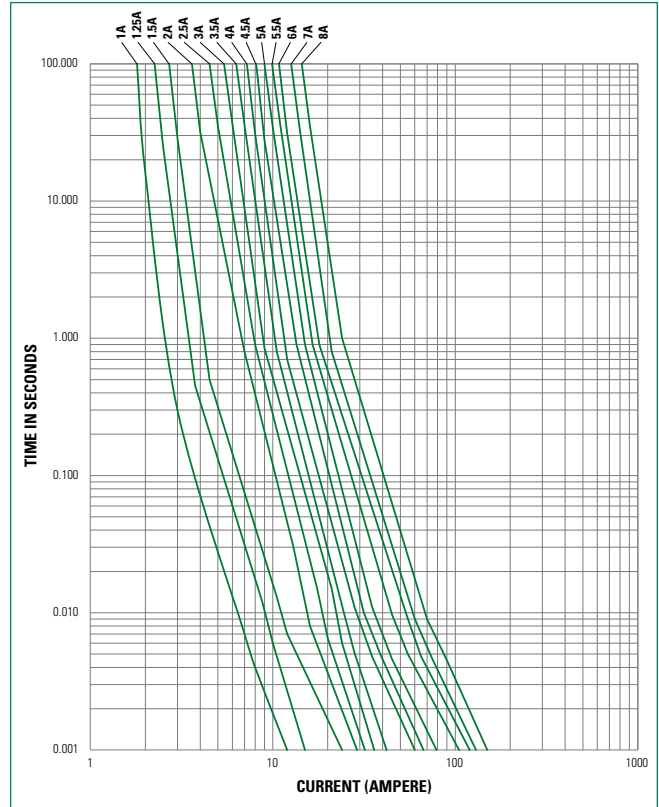
## AEC-Q200 Qualified > Ceramic Fuse

Temperature Re-rating Curve



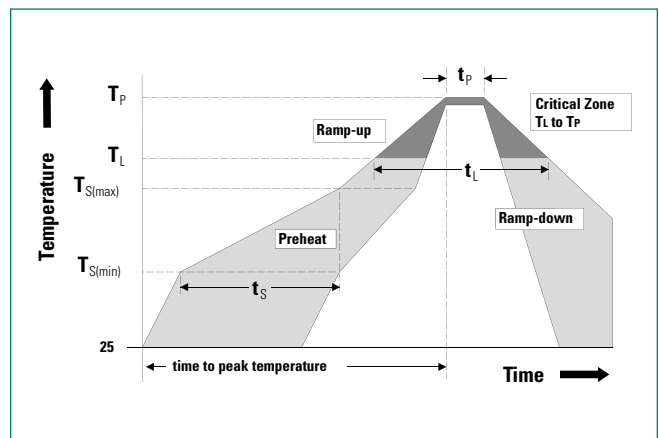
**Note**  
Re-rating depicted in this curve is in addition to the standard re-rating of 20% for continuous operation.  
**Example**  
For continuous operation at 75 °C, the fuse should be rerated as follows:  $I = (0.80)(0.85)_n = (0.68)_n$ .

Average Time Current Curves



Soldering Parameters

<b>Reflow Condition</b>		Pb-free assembly
<b>Pre Heat</b>	- Temperature Min (Ts(min))	150 °C
	- Temperature Max (Ts(max))	200 °C
	- Time (Min to Max) (ts)	60–180 seconds
<b>Average Ramp-up Rate (Liquidus Temp (TL) to peak)</b>		3 °C/second max.
<b>TS(max) to TL - Ramp-up Rate</b>		5 °C/second max.
<b>Reflow</b>	- Temperature (TL) (Liquidus)	217 °C
	- Temperature (tL)	60–150 seconds
<b>Peak Temperature (TP)</b>		260+0/-5 °C
<b>Time within 5°C of actual peak Temperature (tp)</b>		10–30 seconds
<b>Ramp-down Rate</b>		6 °C/second max.
<b>Time 25°C to peak Temperature (TP)</b>		8 minutes max.
<b>Do not exceed</b>		260 °C
<b>Wave soldering</b>		260 °C, 10 seconds max.



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## AEC-Q200 Qualified > Ceramic Fuse

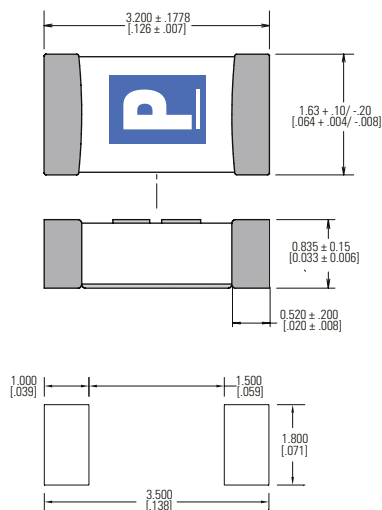
### Product Characteristics

<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

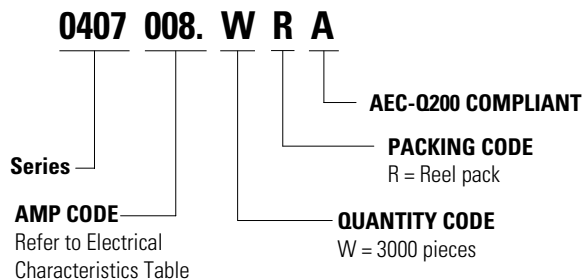
<b>High Temperature Storage</b>	MIL-STD-202, Method 108 with exemptions
<b>Thermal Shock Test</b>	JESD22 Method JA-104, Test Conditions B and N
<b>Biased Humidity</b>	MIL-STD-202, Method 103, 85 °C/85% RH with 10% operating power for 1,000 hrs
<b>Operational Life</b>	MIL-STD-202, Method 108, Test Condition 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>	Conducted at minimum, ambient and maximum temperatures

### Dimensions

All dimensions in mm (in)



### Part Numbering System



### Part Marking System

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

### Packaging

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

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