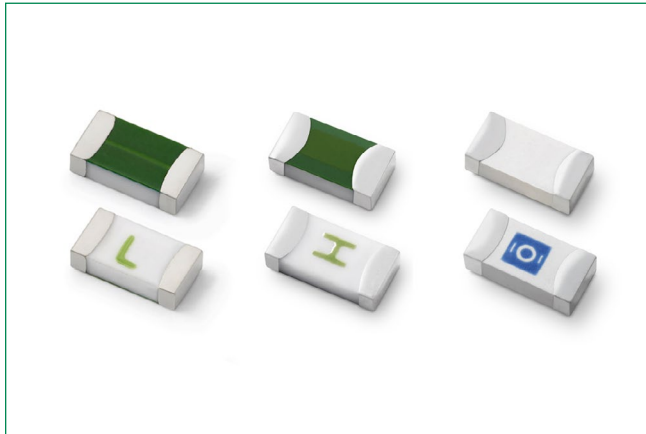


# 437A Series

## AEC-Q200 Qualified > 1206 Fast-Acting Ceramic Fuse



### Additional Information



Resources



Accessories



Samples

### Agency Approvals

Agency	Agency File Number	Ampere Range
	E10480	0.250A – 8.0A
	29862	0.250A – 8.0A
	N/A	0.250A – 1.75A
	J50519871	0.500A – 8.0A
	N/A	0.250A – 1.75A

### Description

The 437A Series AECO-Qualified 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 & Benefits

- Operating Temperature from -55°C to +150°C
- 100% Lead-free, Halogen-Free and RoHS compliant
- Fast response to faulty current to ensure over-current protection for sensitive electronic components
- AEC-Q200 Qualified
- Recognized to UL/CSA/NMX 248-1 and UL/CSA/NMX 248-14
- Conforms to EN/IEC 60127-1 and EN/IEC 60127-7
- Conforms to the Low Voltage Directive (LVD)

### Applications

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

### 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

### 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				
0.250	.250	125	50A @ 125VAC/DC	2.290	0.003	0.78	0.195	x	x	x	-	x
0.375	.375	125		1.330	0.010	0.60	0.225	x	x	x	-	x
0.500	.500	63	50A @ 63VAC/DC	0.908	0.018	0.52	0.260	x	x	x	x	x
0.750	.750	63	50A @ 63VAC/DC 100A @ 63VDC	0.600	0.064	0.45	0.338	x	x	x	x	x
1.00	001.	63	50A @ 63VAC/DC	0.420	0.100	0.41	0.410	x	x	x	x	x
1.25	1.25	63		0.318	0.256	0.40	0.500	x	x	x	x	x
1.50	01.5	63		0.209	0.324	0.39	0.585	x	x	x	x	x
1.75	1.75	63		0.071	0.075	0.27	0.473	x	x	x	x	x
2.00	002.	63	50A @ 45VAC/63VDC 50A @ 32VAC/35VDC	0.062	0.144	0.20	0.400	x	x	x	x	x
2.50	02.5	63		0.043	0.441	0.15	0.375	x	x	x	x	x
3.00	003.	63		0.035	0.506	0.14	0.420	x	x	x	x	x
3.50	03.5	63		0.027	0.777	0.13	0.455	x	x	x	x	x
4.00	004.	63		0.022	1.024	0.13	0.520	x	x	x	x	x
5.00	005.	63		0.0159	2.30	0.13	0.650	x	x	x	x	x
7.00	007.	35		0.0100	5.02	0.13	0.910	x	x	x	x	x
8.00	008.	35		50A @ 32VAC/35VDC	0.008	7.23	0.13	1.040	x	x	x	x

#### Notes:

- 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  $I^2t$  measured at 1 msec. opening time.
- Nominal Voltage Drop measured at rated current after temperature has stabilized.

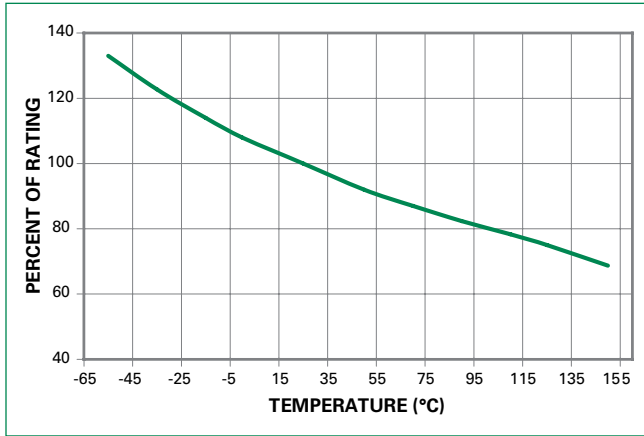
- 50A @ 32VAC/35VDC is AECO Tested

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

## AEC-Q200 Qualified > 1206 Fast-Acting Ceramic Fuse

Temperature Re-rating Curve



**Note:**

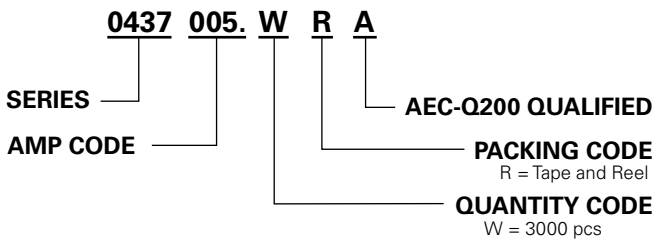
1. Re-rating depicted in this curve is in addition to the standard re-rating of 20% for continuous operation.

**Example:**

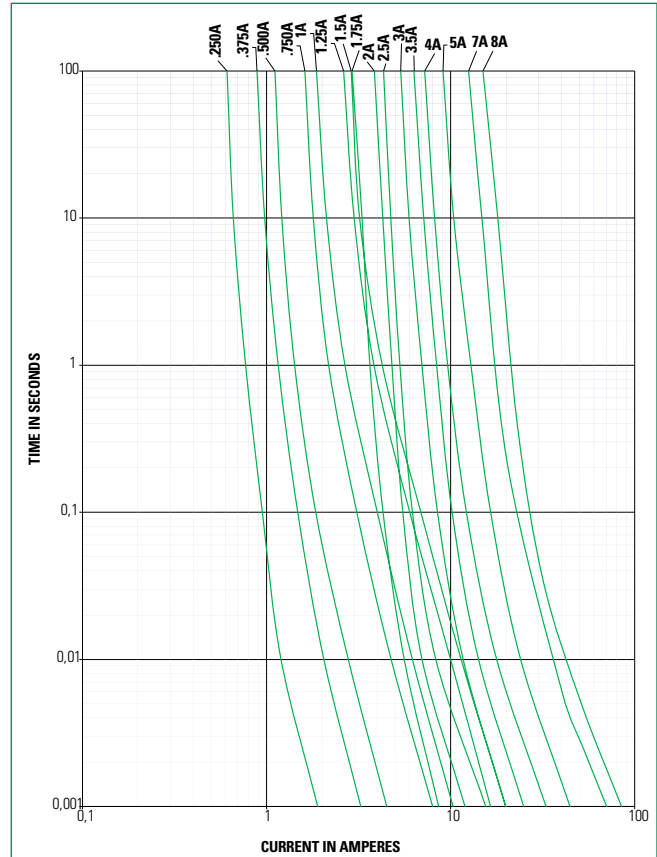
For continuous operation at 75 degrees celsius, the fuse should be rerated as follows:

$$I = (0.80)(0.85)_{75} = (0.68)_{75}$$

Part Numbering System

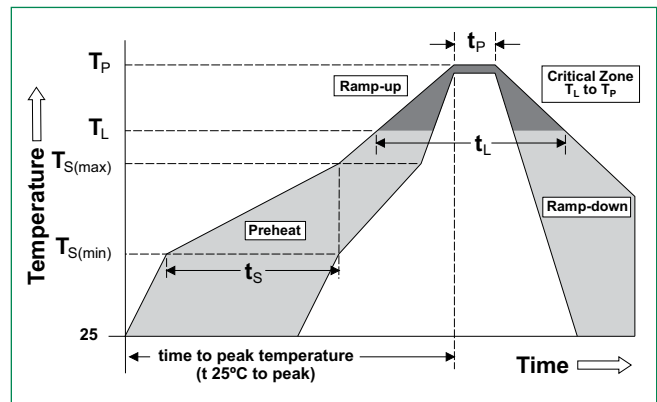


Average Time Current Curves



Soldering Parameters

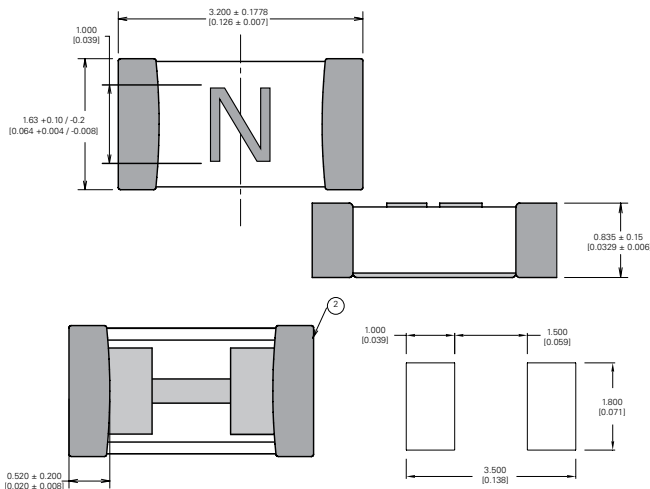
<b>Reflow Condition</b>		Pb-free assembly
<b>Pre Heat</b>	- Temperature Min ( $T_{s(min)}$ )	150°C
	- Temperature Max ( $T_{s(max)}$ )	200°C
	- Time (Min to Max) ( $t_s$ )	60 – 180 seconds
<b>Average Ramp-up Rate (Liquidus Temp (<math>T_L</math>) to peak)</b>		5°C/second max.
<b><math>T_{s(max)}</math> to <math>T_L</math> - Ramp-up Rate</b>		5°C/second max.
<b>Reflow</b>	- Temperature ( $T_L$ ) (Liquidus)	217°C
	- Temperature ( $t_r$ )	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>		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****AEC-Q200 Qualified > 1206 Fast-Acting 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/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>	Conducted at minimum, ambient and maximum temperatures.

**Dimensions mm(inches)****Part Marking System**

Amp Code	Marking Code
.250	<b>D</b>
.375	<b>E</b>
.500	<b>F</b>
.750	<b>G</b>
001.	<b>H</b>
1.25	<b>J</b>
01.5	<b>K</b>
1.75	<b>L</b>
002.	<b>N</b>
02.5	<b>Q</b>
003.	<b>P</b>
3.500	<b>R</b>
004.	<b>S</b>
005.	<b>T</b>
007.	<b>W</b>
008.	<b> X </b>

**Packaging**

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

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