

# 422A Series

## AEC-Q200 Qualified > Ceramic Fuse



### Description

The 422A is a 250V rated Wire-in-Air Surface Mount, AEC-Qualified fuse. They are specifically tested to cater to secondary circuit protection needs of compact auto electronics applications. The wire-in-air design of the 422A Series results in a relatively high  $I^2t$  in a 2410 size.

The general design ensures excellent temperature stability and performance reliability.

### Features & Benefits

- Operating Temperature from -55 °C to 125 °C
- 100% Lead-free, Halogen-free and RoHS compliant
- Fast acting
- 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 J60127-1 and J60127-7
- Avoids nuisance opening due to high inrush and surge current inherent in the system
- Suitable for harsh automotive environments
- Qualified to AEC-Q200

### Additional Information



Resources



Accessories



Samples

### Agency Approvals

Agency	Agency File/Certificate Number	Ampere Range
	E10480	0.75 A to 5 A
	J50501694	0.75 A to 5 A
	JD60156347	0.75 A to 5 A
	NA	0.75 A to 5 A
	NA	0.75 A to 5 A

### Applications

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

### Electrical Characteristics

% of Ampere Rating	Ampere Rating	Opening Time
100%	0.75 A to 5 A	4 Hours, Minimum
200%	0.75 A to 5 A	5 Seconds, Maximum

### Electrical Specifications

Ampere Rating (A)	Amp Code	Max Voltage Rating (V)	Interrupting Rating (AC/DC) <sup>1,4</sup>	Nominal Resistance (Ohms) <sup>2</sup>	Nominal Melting $I^2t$ (A <sup>2</sup> sec) <sup>3</sup>	Agency Approvals				
0.750	.750	250	300 A @ 32 VDC	0.137	0.282	x	x	x	x	x
1.00	001.	250	100 A @ 125 VDC	0.0994	0.611	x	x	x	x	x
1.25	1.25	250	50 A @ 250 VAC	0.0734	1.09	x	x	x	x	x
1.50	01.5	250	50 A @ 250 VDC	0.0589	1.62	x	x	x	x	x
2.00	002.	250	10,000 A @ 86 VDC	0.0453	2.85	x	x	x	x	x
2.50	02.5	125		0.0278	1.29	x	x	x	x	x
3.00	003.	125	300 A @ 32 VDC	0.0223	2.09	x	x	x	x	x
3.15	3.15	125		0.0213	2.40	x	x	x	x	x
3.50	03.5	125	100 A @ 125 VDC	0.0192	2.82	x	x	x	—	x
4.00	004.	125		0.0168	3.60	x	x	x	x	x
5.00	005.	125	50 A @ 125 VAC	0.0137	5.90	x	x	x	x	x

#### Notes

1. AC Interrupting Rating tested at rated voltage with unity power factor. DC Interrupting Rating tested with time constant <0.8 ms for 32 VDC, <2.2 ms for 86 VDC, <0.22 ms for 125 VDC, and <0.1 ms for 250 VDC.

2. Nominal Resistance measured with <10% rated current.

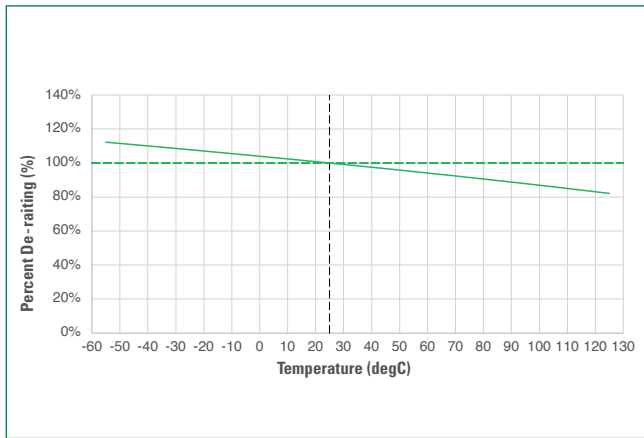
3. Nominal Melting  $I^2t$  measured at 1 msec. opening time.

4. Interrupting Rating may differ based on Agency Approval. See Agency Approval certificate for more details.

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### Temperature Re-rating Curve



#### Notes

1. Re-rating depicted in this curve is in addition to the standard re-rating of 25% for continuous operation.

#### Example:

For continuous operation at 85°C, the fuse should be rated as follows:

$$I = (0.75)(0.90)I_N = (0.675)I_N$$

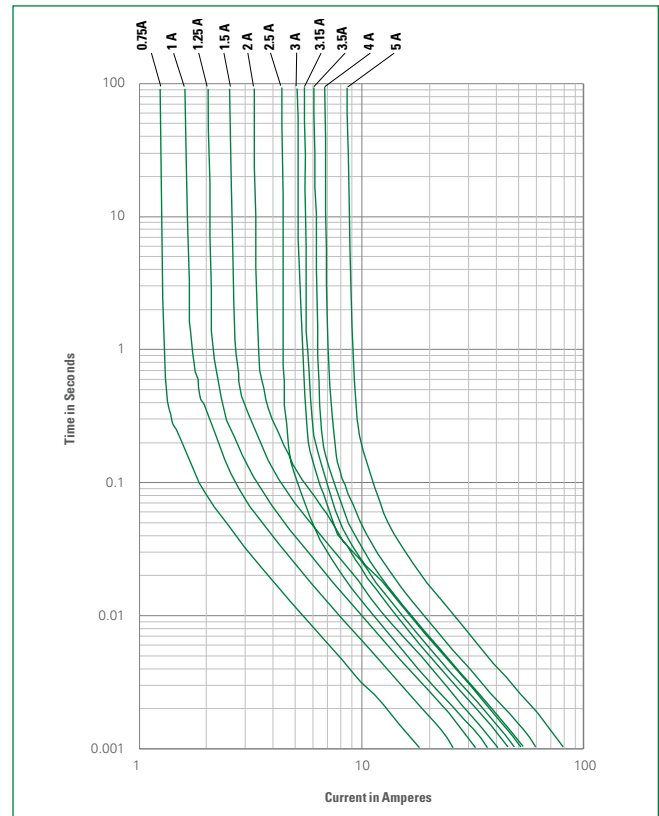
### Pulse Cycle Withstand Capability

No. of Pulses to withstand	Ratio of Pulse $I^2t$ to Nominal $I^2t$
100,000	Pulse $I^2t$ = 18% of Nominal Melting $I^2t$
10,000	Pulse $I^2t$ = 29% of Nominal Melting $I^2t$
1,000	Pulse $I^2t$ = 38% of Nominal Melting $I^2t$
100	Pulse $I^2t$ = 48% of Nominal Melting $I^2t$

#### Note

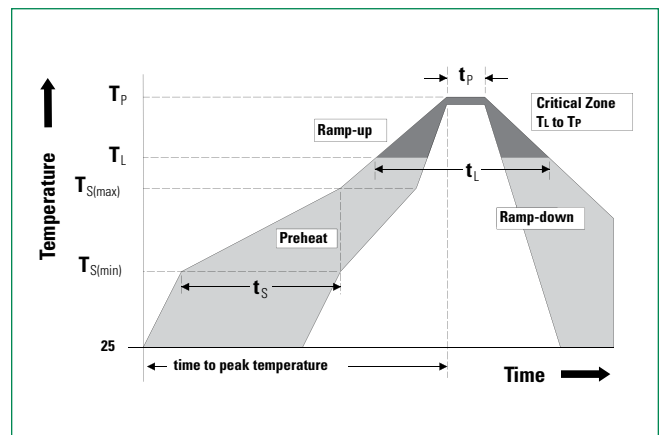
\* Being tested

### 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 secs
<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 ( $t_L$ )	60–150 secs
<b>Peak Temperature (<math>T_p</math>)</b>		260±0/-5 °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 Parameters</b>		260°C Peak Temperature, 10 seconds max.



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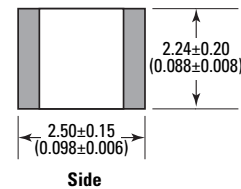
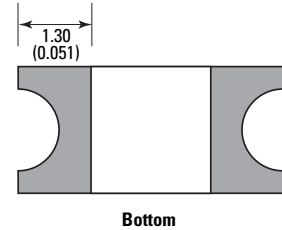
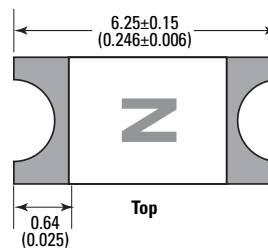
## AEC-Q200 Qualified > Ceramic Fuse

### Product Characteristics

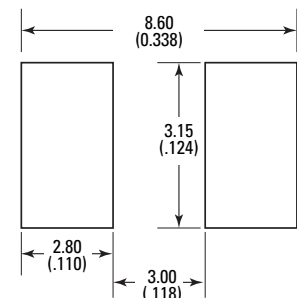
<b>Materials</b>	<b>Body:</b> Epoxy Resin <b>Terminations:</b> Cu/Ni/Sn (100% Pb-free)
<b>Product Marking</b>	<b>Body:</b> Ampere Marking Code. See Part Marking.
<b>Operating Temperature</b>	-55 °C to +125 °C
<b>Insulation Resistance</b>	IEC 60127-4 (0.1 MΩ Min.)
<b>High Temperature Storage</b>	MIL-STD-202, Method 108
<b>Thermal Shock Test</b>	JESD22 Method A104C
<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 K modified)
<b>Solderability</b>	JESD22-B102E Method 1
<b>Moisture Resistance</b>	MIL-STD-202 Method 106
<b>Moisture Sensitivity Level 1</b>	IPC/JEDEC J-STD-020D Level 1
<b>Terminal Strength</b>	AEC-Q200-006
<b>Board Bend/Flex</b>	AEC-Q200-005
<b>Electrical Characterization</b>	Conducted at minimum, ambient, and maximum temperatures

### Dimensions

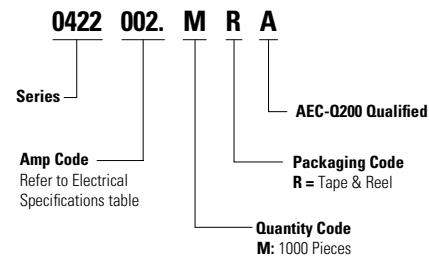
All dimensions in mm (in)



#### Recommended Pad Layout



### Part Numbering System



### Packaging

Packaging Option	Packaging Specification	Quantity	Quantity & Packaging Code
Tape and Reel	EIA-481, IEC 60286-3	1000	MR

### Part Marking System

Amp Code	Marking Code
.750	G
001.	H
1.25	J
01.5	K
002.	N
02.5	O
003.	P
3.15	B
03.5	C
004.	S
005.	T

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