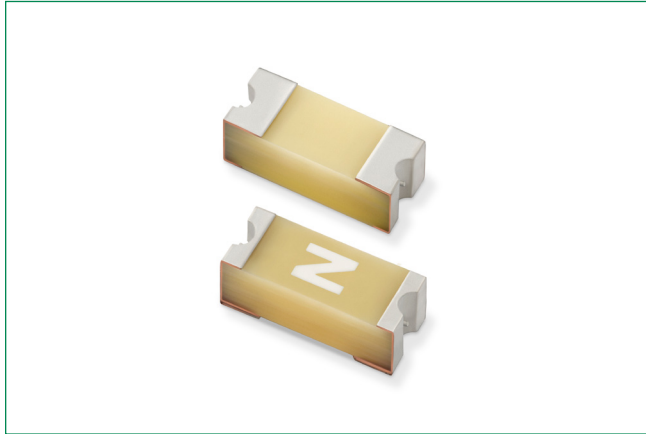


# 422A Series

## 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<sup>2</sup>t 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 <sup>2</sup> t (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                    | 100 A @ 125 VDC                            | 0.0213                                 | 2.40   | x                | x | x | x | x |
| 3.50              | 03.5     | 125                    |  | 0.0192                                 | 2.82   | x                | x | x | - | x |
| 4.00              | 004.     | 125                    | 50 A @ 125 VAC                             | 0.0168                                 | 3.60   | x                | x | x | x | x |
| 5.00              | 005.     | 125                    |  | 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.

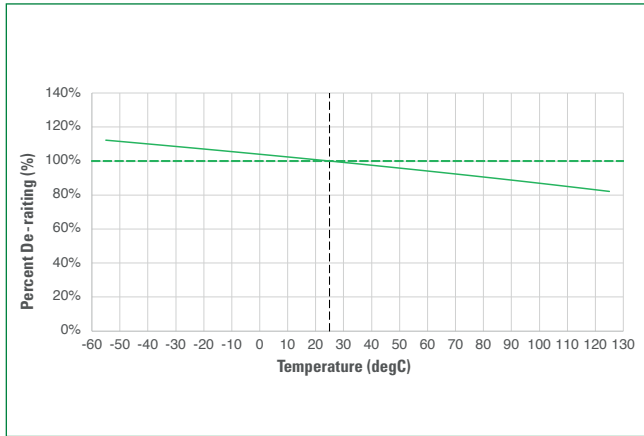
3. Nominal Melting I<sup>2</sup>t measured at 1 msec. opening time.

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

# 422A Series

## AEC-Q200 Qualified > Ceramic Fuse

### 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 rerated as follows:

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

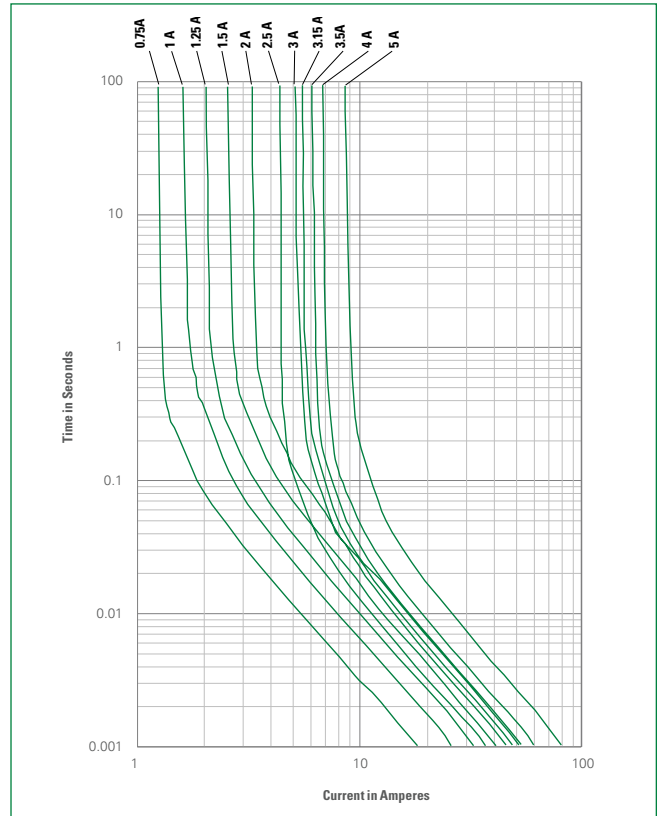
### Pulse Cycle Withstand Capability

| No. of Pulses to withstand | Ratio of Pulse I <sup>2</sup> t to Nominal I <sup>2</sup> t      |
|----------------------------|--|
| 100,000                    | Pulse I <sup>2</sup> t = 18% of Nominal Melting I <sup>2</sup> t |
| 10,000                     | Pulse I <sup>2</sup> t = 29% of Nominal Melting I <sup>2</sup> t |
| 1,000                      | Pulse I <sup>2</sup> t = 38% of Nominal Melting I <sup>2</sup> t |
| 100                        | Pulse I <sup>2</sup> t = 48% of Nominal Melting I <sup>2</sup> t |

**Note**

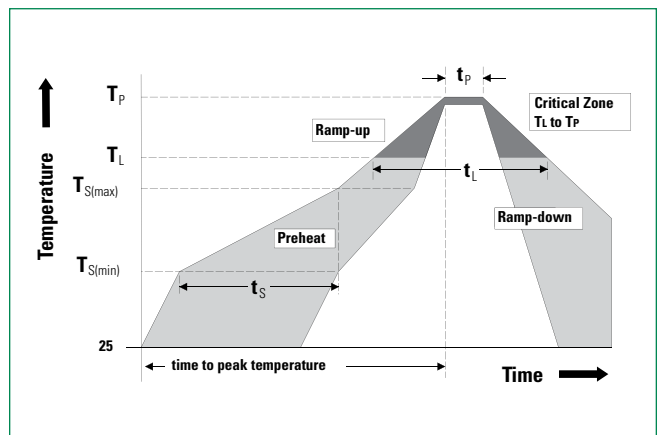
\* Being tested

### Average Time Current Curves



### Soldering Parameters

|   |  |   |
|---|--|---|
| <b>Reflow Condition</b>   |  | Pb – Free assembly                      |
| <b>Pre Heat</b>   | - Temperature Min (T <sub>s(min)</sub> )   | 150 °C                                  |
|   | - Temperature Max (T <sub>s(max)</sub> )   | 200 °C                                  |
|   | - Time (Min to Max) (t <sub>s</sub> )      | 60–180 secs                             |
| <b>Average ramp up rate (Liquidus Temp (T<sub>L</sub>) to peak)</b> |  | 5 °C/second max.                        |
| <b>T<sub>S(max)</sub> to T<sub>L</sub> - Ramp-up Rate</b>           |  | 5 °C/second max.                        |
| <b>Reflow</b>   | - Temperature (T <sub>L</sub> ) (Liquidus) | 217 °C                                  |
|   | - Temperature (t <sub>L</sub> )            | 60–150 secs                             |
| <b>Peak Temperature (T<sub>p</sub>)</b>                             |  | 260+0/-5 °C                             |
| <b>Time within 5 °C of actual peak Temperature (t<sub>p</sub>)</b>  |  | 10–30 seconds                           |
| <b>Ramp-down Rate</b>   |  | 6°C/second max.                         |
| <b>Time 25 °C to peak Temperature (T<sub>p</sub>)</b>               |  | 8 minutes max.                          |
| <b>Do not exceed</b>  |  | 260 °C                                  |
| <b>Wave Soldering Parameters</b>                                    |  | 260°C Peak Temperature, 10 seconds max. |



# 422A Series

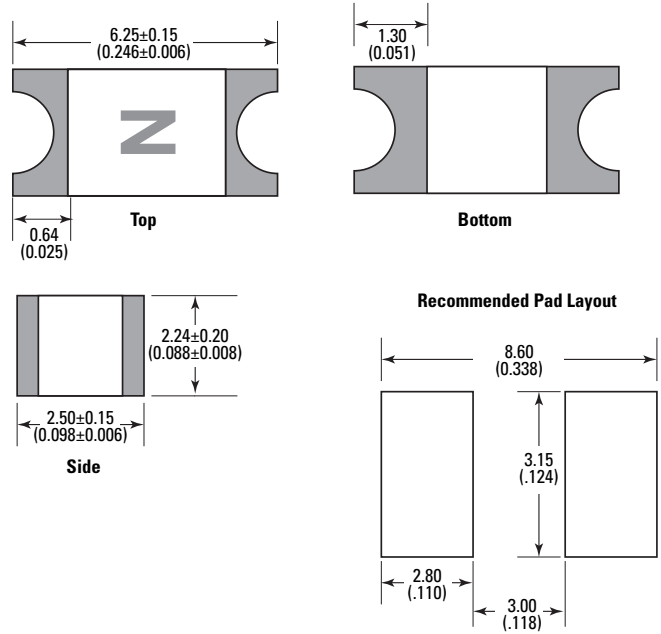
## AEC-Q200 Qualified > Ceramic Fuse

### Product Characteristics

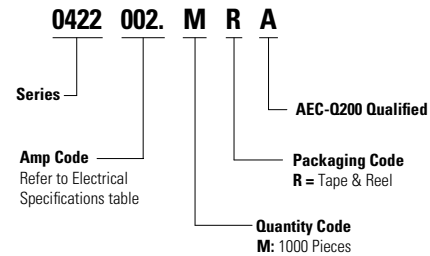
|                                     |   |
|-------------------------------------|---|
| <b>Materials</b>                    | <b>Body:</b> Epoxy Resin<br><b>Terminations:</b> Cu/Ni/Sn (100% Pb-free)    |
| <b>Product Marking</b>              | <b>Body:</b> Ampere Marking Code. See Part Marking.                         |
| <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)



### 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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