

# Type 3AG/3AP

## Fast Blow Fuse Series

HF  3AG/3AP Series, 6x32mm Glass Tube Fast Blow Fuse

RoHS 6 Compliant

### Description

6x32mm Fast Blow, glass tube body cartridge fuse designed, approved and complied with UL and CSA standard 248-14.

### Features

- Meet UL and CSA standard 248-14
- Wide operating temperature range
- Bulk and Tape & Reel packing available
- RoHS 6 compliant
- Halogen Free
- Leadfree

### Applications

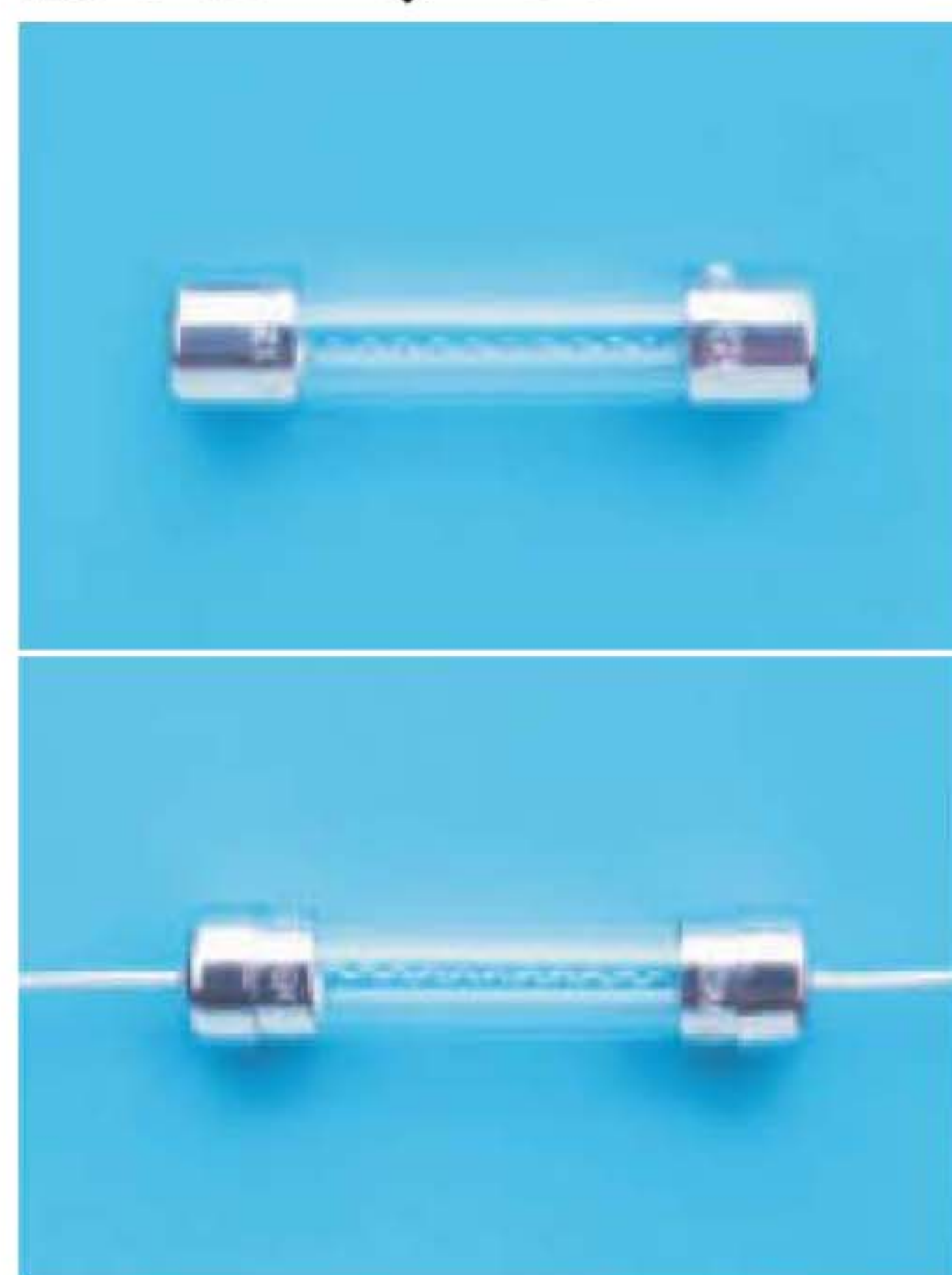
Provide individual protection for components or internal circuits.

- Power supplies
- Battery charger
- Monitor
- Adapter

LEAD FREE =   
HALOGEN FREE = 

### Physical Specifications

|           |                                                                                                                                                                                                                                                                                                                                   |
|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Materials | Body : Glass                                                                                                                                                                                                                                                                                                                      |
|           | Cap : Nickel Plated Brass Caps                                                                                                                                                                                                                                                                                                    |
|           | Leads : Matte Tin Plated Copper                                                                                                                                                                                                                                                                                                   |
| Marking   | On Fuse :                                                                                                                                                                                                                                                                                                                         |
|           | "bel", "3AG", "Current Rating", "Voltage Rating",                                                                                                                                                                                                                                                                                 |
|           | "Appropriate Safety Logos", "  "(RoHS 6 compliant)                                                                                                                                                                                           |
|           | On Label :                                                                                                                                                                                                                                                                                                                        |
|           | "bel", "3AG" or "3AP", "Current Rating", "Voltage Rating", "Interrupting Rating",<br>" Appropriate Safety Logos" and "  ", "  " (China RoHS compliant). |



### Electrical Characteristics (UL / CSA STD.248-14)

| Testing Current | Blow Time |         |
|-----------------|-----------|---------|
|                 | Minimum   | Maximum |
| 100%            | 4 hrs.    | N/A     |
| 135%            | N/A       | 1 Hr    |
| 200%            | N/A       | 5 sec   |

### Safety Agency Approvals

| SAFETY AGENCY                                                                        | SAFETY AGENCY CERTIFICATE NUMBER         | VOLTAGE RATING (V)                       | AMPERE RANGE / VOLT @ I.R. ABILITY* |
|--------------------------------------------------------------------------------------|------------------------------------------|------------------------------------------|-------------------------------------|
|  | E20624                                   | 100mA-10A / 250V AC<br>12A-15A / 125V AC | 100mA-10A / 250V AC@ 200A           |
|  | LR39772                                  |                                          | 100mA-15A / 125V AC@ 10,000A        |
|  | JET1037-31003-1010<br>JET1037-31003-1011 |                                          | 1A-5A / 125V AC @ 500A              |
|                                                                                      | JET1037-31003-1007                       |                                          | >5A-15A / 125V AC@ 300A             |

\* I.R. = INTERRUPTING RATING = SHORT CIRCUIT RATING (AMPS)

Specifications subject to change without notice



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### Environmental Specifications

|                           |                                                                                                  |
|---------------------------|--------------------------------------------------------------------------------------------------|
| Shock Resistance          | MIL-STD-202G, Method 213B, Test Condition 1 (100 G's peak for 6 milliseconds; Sawtooth waveform) |
| Vibration Resistance      | MIL-STD-202G, Method 201A(10-55 Hz, 0.06 inch, total excursion).                                 |
| Salt Spray Resistance     | MIL-STD-202G, Method 101E, Test Condition B(48 hrs).                                             |
| Insulation Resistance     | MIL-STD-202G, Method 302, Test Condition A (After Opening) 10, 000 ohms minimum.                 |
| Solderability             | MIL-STD-202G, Method 208H                                                                        |
| Resistance to solder Heat | MIL-STD-202G, Method 210F, Test Condition B.(260+/-5 °C,10+/-1 sec)                              |
| Thermal Shock             | MIL-STD-202G, Method 107G, Test Condition B (-65 °C to +125 °C).                                 |
| Operating Temperature     | -55 °C to +125 °C                                                                                |
| Terminal Strength         | IEC-68-2-21                                                                                      |

### Electrical Specifications

| Catalog Number   | Ampere Rating | Typical Cold Resistance (ohm) | Volt-drop @100% In (Volt) max. | Voltage and Interrupting Ratings                                                        | Melting I <sup>2</sup> T <10 mSec (A <sup>2</sup> Sec) | Melting I <sup>2</sup> T @10 In (A <sup>2</sup> Sec) | Maximum Power Dissipation (W) | Agency Approvals                                                                      |                                                                                       |                                                                                       |
|------------------|---------------|-------------------------------|--------------------------------|-----------------------------------------------------------------------------------------|--------------------------------------------------------|------------------------------------------------------|-------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|                  |               |                               |                                |                                                                                         |                                                        |                                                      |                               |  |  |  |
| 3AG (3AP) 100-R  | 100mA         | 11.3                          | 4.62                           | See Table of Safety Approvals on Page 1 for Voltage and associated Interrupting Ratings | 0.002                                                  | 0.002                                                | 0.59                          | Y                                                                                     | Y                                                                                     |                                                                                       |
| 3AG (3AP) 125-R  | 125mA         | 10.5                          | 5.18                           |                                                                                         | 0.004                                                  | 0.003                                                | 0.80                          | Y                                                                                     | Y                                                                                     |                                                                                       |
| 3AG (3AP) 160-R  | 160mA         | 7.3                           | 4.85                           |                                                                                         | 0.008                                                  | 0.006                                                | 0.94                          | Y                                                                                     | Y                                                                                     |                                                                                       |
| 3AG (3AP) 200-R  | 200mA         | 5.0                           | 4.38                           |                                                                                         | 0.014                                                  | 0.010                                                | 1.10                          | Y                                                                                     | Y                                                                                     |                                                                                       |
| 3AG (3AP) 250-R  | 250mA         | 3.4                           | 4.05                           |                                                                                         | 0.025                                                  | 0.019                                                | 1.29                          | Y                                                                                     | Y                                                                                     |                                                                                       |
| 3AG (3AP) 300-R  | 300mA         | 2.5                           | 3.54                           |                                                                                         | 0.044                                                  | 0.034                                                | 1.51                          | Y                                                                                     | Y                                                                                     |                                                                                       |
| 3AG (3AP) 375-R  | 375mA         | 1.86                          | 3.35                           |                                                                                         | 0.071                                                  | 0.055                                                | 1.64                          | Y                                                                                     | Y                                                                                     |                                                                                       |
| 3AG (3AP) 400-R  | 400mA         | 1.32                          | 3.22                           |                                                                                         | 0.08                                                   | 0.08                                                 | 1.71                          | Y                                                                                     | Y                                                                                     |                                                                                       |
| 3AG (3AP) 500-R  | 500mA         | 1.19                          | 3.17                           |                                                                                         | 0.14                                                   | 0.11                                                 | 1.88                          | Y                                                                                     | Y                                                                                     |                                                                                       |
| 3AG (3AP) 750-R  | 750mA         | 0.66                          | 2.54                           |                                                                                         | 0.19                                                   | 0.17                                                 | 2.15                          | Y                                                                                     | Y                                                                                     |                                                                                       |
| 3AG (3AP) 1-R    | 1A            | 0.155                         | 0.28                           |                                                                                         | 1.4                                                    | 1.4                                                  | 0.37                          | Y                                                                                     | Y                                                                                     | Y                                                                                     |
| 3AG (3AP) 1.25-R | 1.25A         | 0.114                         | 0.27                           |                                                                                         | 2.4                                                    | 2.5                                                  | 0.44                          | Y                                                                                     | Y                                                                                     | Y                                                                                     |
| 3AG (3AP) 1.6-R  | 1.6A          | 0.085                         | 0.27                           |                                                                                         | 4.2                                                    | 4.4                                                  | 0.51                          | Y                                                                                     | Y                                                                                     | Y                                                                                     |
| 3AG (3AP) 2-R    | 2A            | 0.057                         | 0.22                           |                                                                                         | 7.2                                                    | 7.6                                                  | 0.59                          | Y                                                                                     | Y                                                                                     | Y                                                                                     |
| 3AG (3AP) 2.5-R  | 2.5A          | 0.043                         | 0.21                           |                                                                                         | 12                                                     | 13                                                   | 0.70                          | Y                                                                                     | Y                                                                                     | Y                                                                                     |
| 3AG (3AP) 3-R    | 3A            | 0.033                         | 0.17                           |                                                                                         | 21                                                     | 23                                                   | 0.83                          | Y                                                                                     | Y                                                                                     | Y                                                                                     |
| 3AG (3AP) 3.5-R  | 3.5A          | 0.027                         | 0.18                           |                                                                                         | 28                                                     | 31                                                   | 0.91                          | Y                                                                                     | Y                                                                                     | Y                                                                                     |
| 3AG (3AP) 4-R    | 4A            | 0.024                         | 0.17                           |                                                                                         | 36                                                     | 40                                                   | 1.00                          | Y                                                                                     | Y                                                                                     | Y                                                                                     |
| 3AG (3AP) 5-R    | 5A            | 0.018                         | 0.16                           |                                                                                         | 63                                                     | 70                                                   | 1.20                          | Y                                                                                     | Y                                                                                     | Y                                                                                     |
| 3AG (3AP) 6-R    | 6A            | 0.014                         | 0.15                           |                                                                                         | 107                                                    | 123                                                  | 1.40                          | Y                                                                                     | Y                                                                                     | Y                                                                                     |
| 3AG (3AP) 7-R    | 7A            | 0.012                         | 0.16                           |                                                                                         | 141                                                    | 162                                                  | 1.60                          | Y                                                                                     | Y                                                                                     | Y                                                                                     |
| 3AG (3AP) 8-R    | 8A            | 0.010                         | 0.15                           |                                                                                         | 184                                                    | 214                                                  | 1.70                          | Y                                                                                     | Y                                                                                     | Y                                                                                     |
| 3AG (3AP) 10-R   | 10A           | 0.008                         | 0.13                           |                                                                                         | 316                                                    | 372                                                  | 2.00                          | Y                                                                                     | Y                                                                                     | Y                                                                                     |
| 3AG (3AP) 12-R   | 12A           | 0.006                         | 0.13                           |                                                                                         | 501                                                    | 597                                                  | 2.40                          | Y                                                                                     | Y                                                                                     | Y                                                                                     |
| 3AG (3AP) 15-R   | 15A           | 0.006                         | 0.15                           |                                                                                         | 845                                                    | 1023                                                 | 2.80                          | Y                                                                                     | Y                                                                                     | Y                                                                                     |

Consult manufacturer for other ratings

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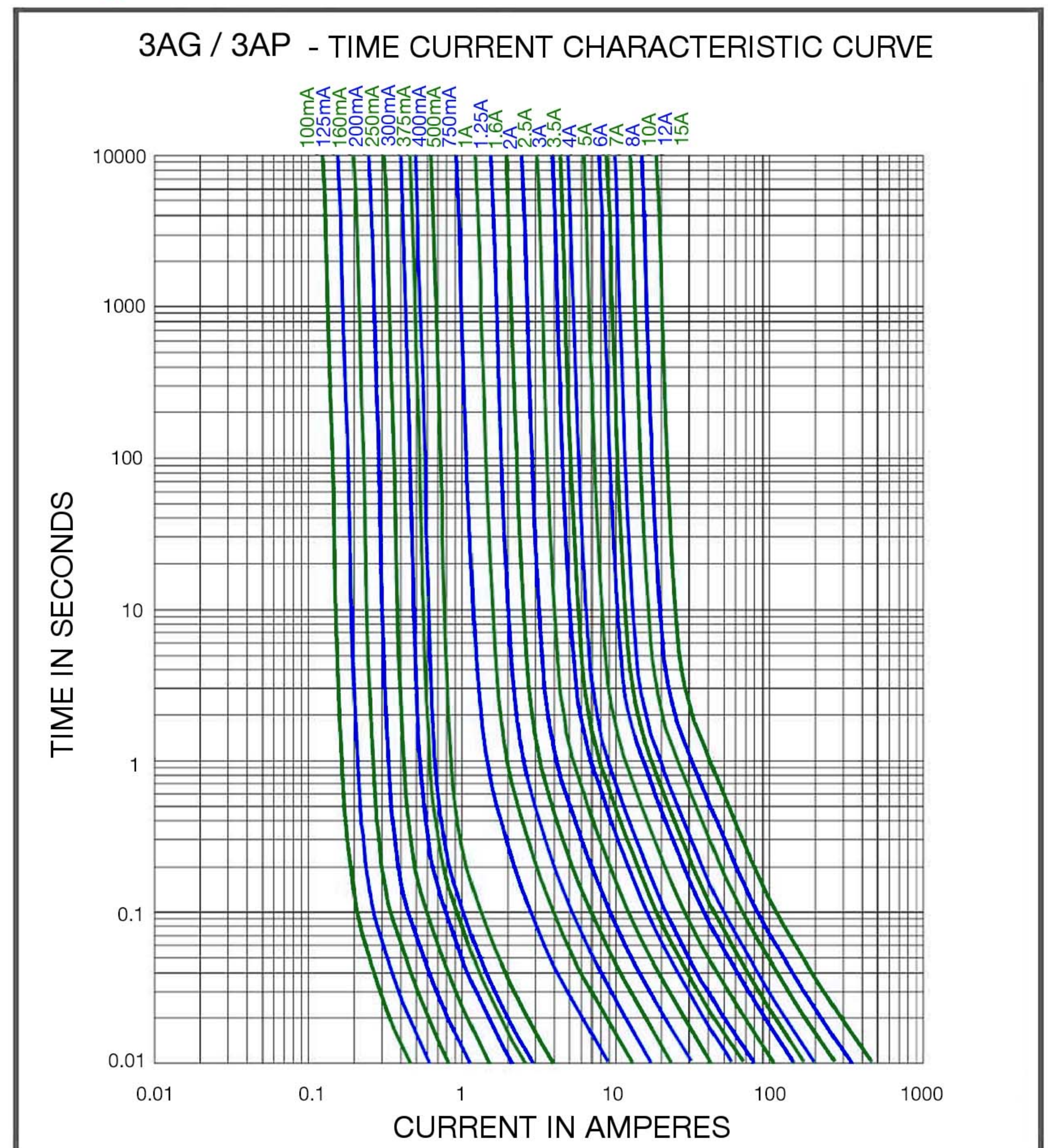
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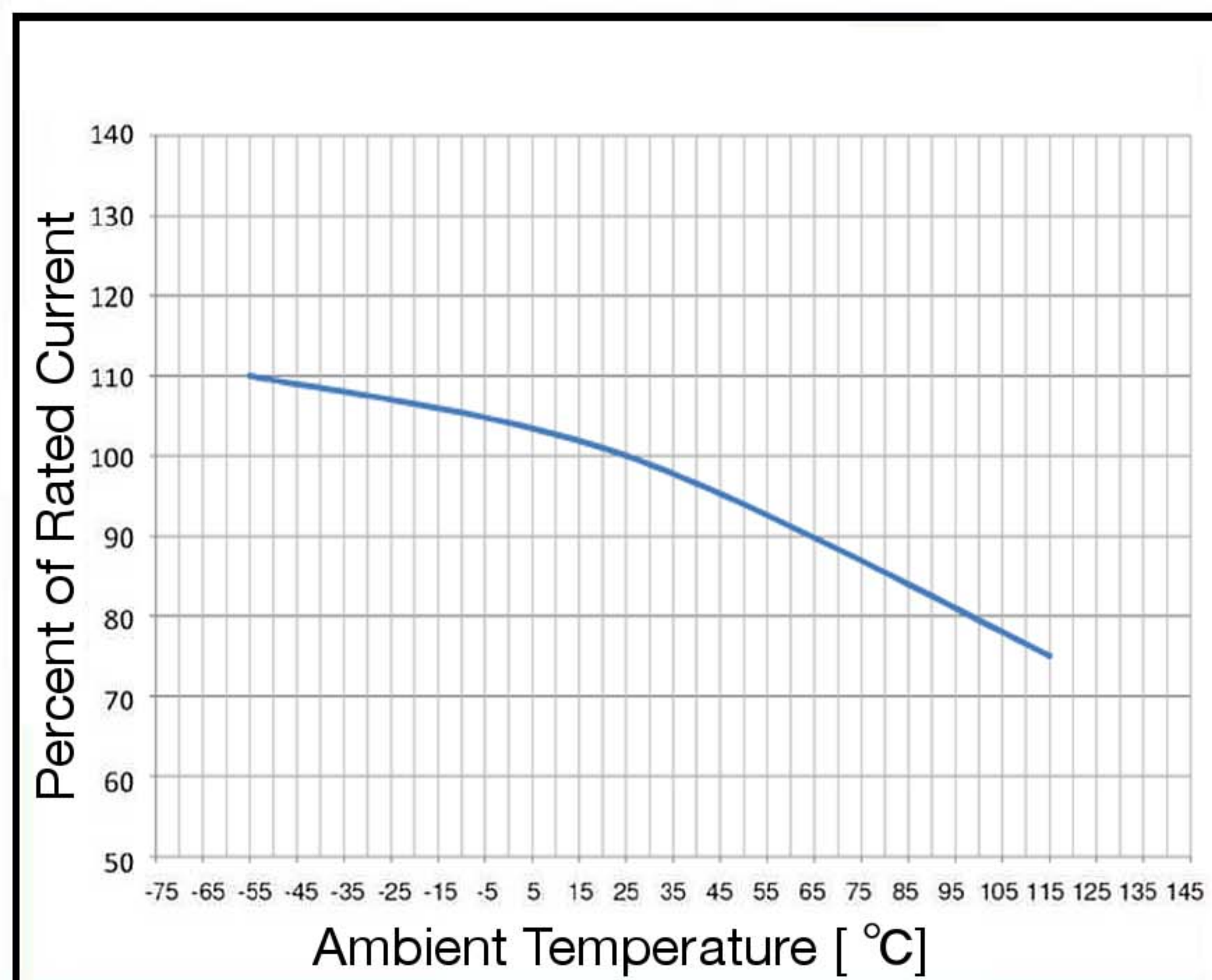
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### Average Time Current Curve

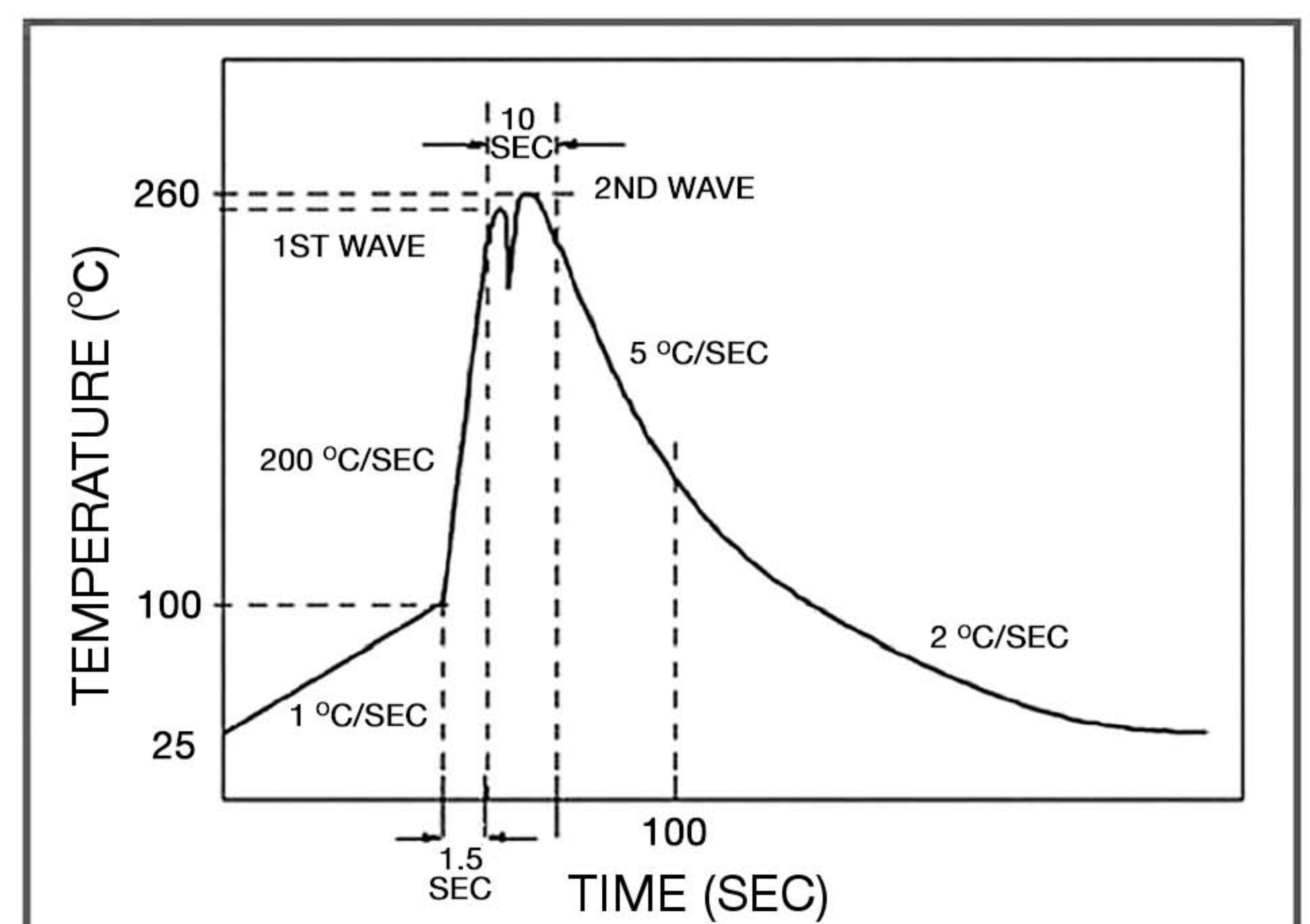


### Temperature Derating Curve



### Soldering Parameters

| Lead-free Wave Soldering Profile                     |                                                |
|------------------------------------------------------|------------------------------------------------|
| Wave Soldering Parameter                             |                                                |
| Average ramp-up rate                                 | 200 °C / second                                |
| Heating rate during preheat                          | typical 1 - 2 °C / second<br>Max 4 °C / second |
| Final preheat temperature                            | within 125 °C of soldering temperature         |
| Peak temperature Tp                                  | 260 °C                                         |
| Time within +0 °C / -5 °C of actual peak temperature | 10 seconds                                     |
| Ramp-down rate                                       | 5 °C / second max.                             |



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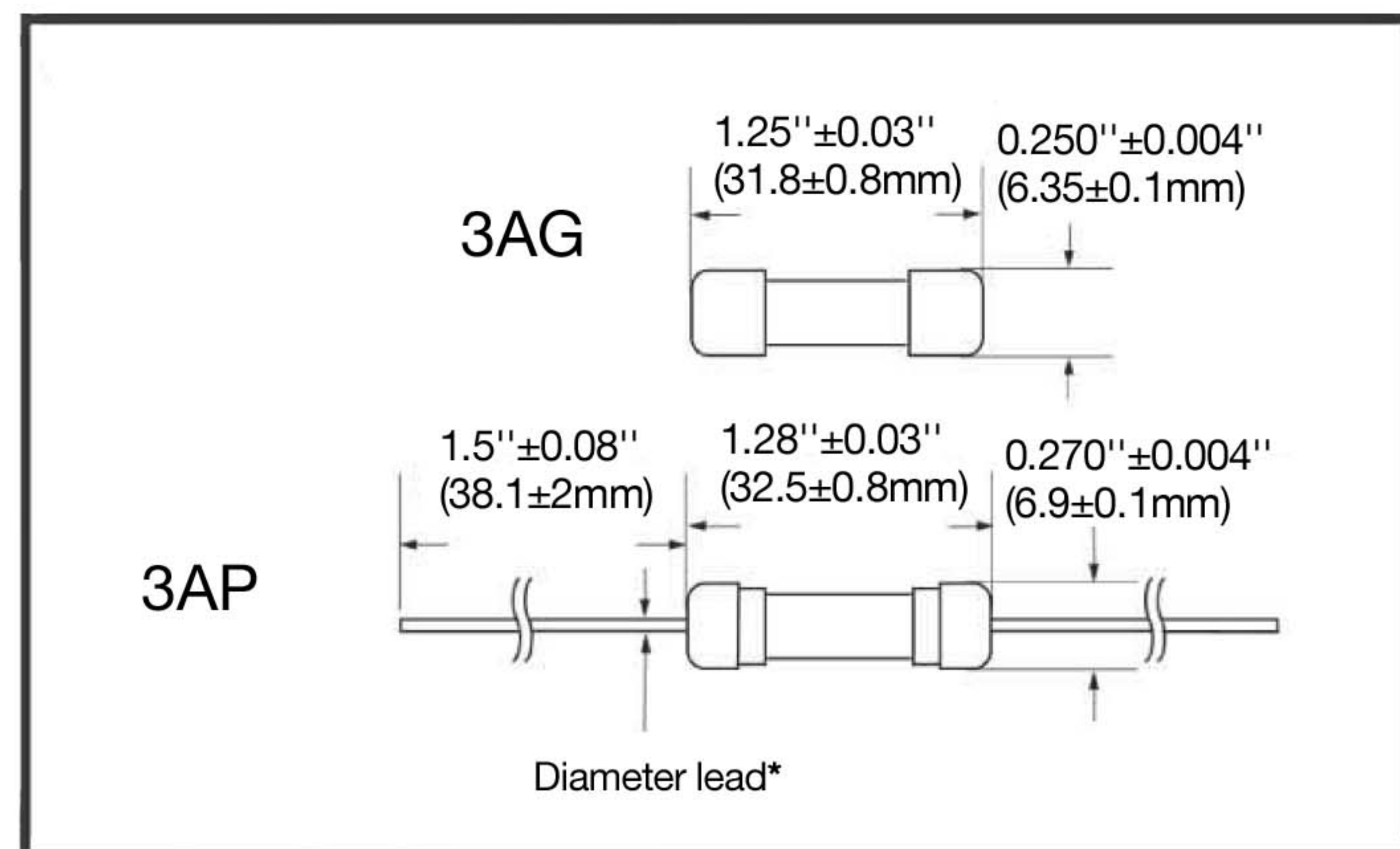
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### Fuse FGNO Explanation

06XX X [XXXX] X XX, [XXXX]=Ampere Rating

| Fraction | Decimal | Milliamps | Bel FGNO[XXXX] | Fraction | Decimal | Amps | Bel FGNO[XXXX] |
|----------|---------|-----------|----------------|----------|---------|------|----------------|
| 1/32     | 0.032   | 32        | 0032           |          | 1.0     | 1    | 1000           |
| 1/25     | .040    | 40        | 0040           | 1-1/4    | 1.25    | 1.25 | 1250           |
| 1/20     | .050    | 50        | 0050           | 1-1/2    | 1.50    | 1.5  | 1500           |
| 1/16     | .063    | 63        | 0063           |          | 1.60    | 1.6  | 1600           |
| 8/100    | .080    | 80        | 0080           |          | 2.0     | 2    | 2000           |
| 1/10     | .100    | 100       | 0100           | 2-1/4    | 2.25    | 2.25 | 2250           |
| 1/8      | .125    | 125       | 0125           | 2-1/2    | 2.5     | 2.5  | 2500           |
| 15/100   | .150    | 150       | 0150           |          | 3.0     | 3    | 3000           |
|          | .160    | 160       | 0160           |          | 3.15    | 3.15 | 3150           |
| 2/10     | .200    | 200       | 0200           | 3-1/2    | 3.5     | 3.5  | 3500           |
| 1/4      | .250    | 250       | 0250           |          | 4.0     | 4    | 4000           |
| 3/10     | .300    | 300       | 0300           |          | 5.0     | 5    | 5000           |
|          | .315    | 315       | 0315           |          | 6.0     | 6    | 6000           |
| 3/8      | .375    | 375       | 0375           |          | 6.3     | 6.3  | 6300           |
| 4/10     | .400    | 400       | 0400           |          | 7.0     | 7    | 7000           |
| 1/2      | .500    | 500       | 0500           | 7-1/2    | 7.5     | 7.5  | 7500           |
| 6/10     | .600    | 600       | 0600           |          | 8.0     | 8    | 8000           |
|          | .630    | 630       | 0630           |          |         | 10   | 9100           |
| 7/10     | .700    | 700       | 0700           |          |         | 12   | 9120           |
| 3/4      | .750    | 750       | 0750           |          |         | 15   | 9150           |
| 8/10     | .800    | 800       | 0800           |          |         | 20   | 9200           |
|          |         |           |                |          |         | 25   | 9250           |
|          |         |           |                |          |         | 30   | 9300           |

### Mechanical Dimensions



\*Ratings 7A and less have 0.032" diameter lead;  
Ratings 8A and above have 0.040" diameter lead.

### Ordering Information

06XX R XXXX - X X

FUSE TYPE \_\_\_\_\_

0601 = 3AG

0611 = 3AP

R = RoHS Compliant \_\_\_\_\_

AMPERE RATING \_\_\_\_\_

Refer to fuse FGNO explanation table

PACKAGING CODE \_\_\_\_\_

3 = 3AG, Cartridge, 1K / Box

3 = 3AP, Pigtail, Bulk, 1K / Box

7 = 3AP, Pigtail, T&R. 1K/Reel

VOLTAGE CODE \_\_\_\_\_

2 = 125V, for 12A-15A

3 = 250V, for 100mA-10A

### Packaging

| Packaging Option        | Packaging Specification | Quantity | Packaging Code | Inside Tape Spacing |
|-------------------------|-------------------------|----------|----------------|---------------------|
| Bulk                    | N/A                     | 1000     | 33 / 32        | N/A                 |
| Bulk (Pigtail Type)     | N/A                     | 1000     | 33 / 32        | N/A                 |
| Tape & Reel, 10mm Pitch | EIA-296-F               | 1000     | 73 / 72        | 73                  |

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