

# Type 5HF / 5HFP

## Quick - acting Fuse Series (High-Breaking Capacity)

HF  5HF/5HFP Series, 5x20mm Ceramic Tube Quick-acting Fuse

RoHS 6 Compliant

### Description

5x20mm quick-acting, high breaking capacity, ceramic body cartridge fuse designed, approved and complied with IEC 60127-2, standard sheet 1.

### Features

- High breaking capacity (250V ac @ 1500A)
- Meet IEC standard 60127-2, sheet 1
- 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 : Ceramic                                                                                                                                                                                                                                                                                                                    |
|           | Cap : Nickel Plated Brass Caps                                                                                                                                                                                                                                                                                                    |
|           | Leads : Matte Tin Plated Copper                                                                                                                                                                                                                                                                                                   |
| Marking   | On Fuse :                                                                                                                                                                                                                                                                                                                         |
|           | "bel", "F", "Current Rating", "H", "250V",                                                                                                                                                                                                                                                                                        |
|           | "Appropriate Safety Logos", "  "(RoHS 6 compliant)                                                                                                                                                                                           |
|           | On Label :                                                                                                                                                                                                                                                                                                                        |
|           | "bel", "5HF" or "5HFP", "Current Rating", "Voltage Rating", "Interrupting Rating",<br>" Appropriate Safety Logos" and "  ", "  "(China RoHS compliant). |



### Electrical Characteristics(IEC-127-2 STANDARD SHEET 1) Safety Agency Approvals

| Rated Current  | 1.5 In | 2.1 In | 2.75 In |     | 4 In |      | 10 In |
|----------------|--------|--------|---------|-----|------|------|-------|
|                | MIN    | MAX    | MIN     | MAX | MIN  | MAX  | MAX   |
| 100mA to 3.15A | 1      | 30     | 10      | 2   | 3    | 300  | 20    |
| 4A to 6.3A     | 1      | 30     | 10      | 3   | 3    | 300  | 20    |
| 8A to 12A      | 1      | 30     | 40      | 20  | 10   | 1000 | 30    |
|                | hr.    | min.   | ms      | sec | ms   | ms   | ms    |

In clause 9.2, the test voltage for 5HFP ratings from 1A to 6.3A is 63VDC.

| SAFETY AGENCY                                                                         | SAFETY AGENCY CERTIFICATE NUMBER         | VOLTAGE RATING (V) | AMPERE RANGE / VOLT @ I.R. ABILITY*                       |
|---------------------------------------------------------------------------------------|------------------------------------------|--------------------|-----------------------------------------------------------|
|  | 1410138<br>1400793                       | 100mA-10A/250V AC  | 1A - 6.3A / 250V AC @ 1500A<br>8A - 12A / 250V AC @ 1500A |
|  | 40000506                                 |                    | 1A - 6.3A / 250V AC @ 1500A                               |
|  | EM233                                    |                    | 100mA - 10A / 250V AC @ 1500A                             |
|  | E20624                                   |                    | 1A - 5A / 250V AC @ 1500A                                 |
|  | LR39772                                  |                    | 100mA - 10A / 250V AC @ 1500A                             |
|  | JET1037-31003-1008<br>JET1037-31003-1009 |                    | 100mA - 10A / 250V AC @ 1500A                             |
|  | 2002010207021529                         |                    |                                                           |

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

Specifications subject to change without notice



Bel Fuse Inc.  
206 Van Vorst Street  
Jersey City, NJ 07302 USA

+1 201.432.0463  
techhelp@belf.com  
[belfuse.com](http://belfuse.com)



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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 B (After Opening) 100, 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 |     |     |   |    |     |    |
|----------------|---------------|-------------------------------|--------------------------------|-----------------------------------------------------------------------------------------|--------------------------------------------------------|------------------------------------------------------|-------------------------------|------------------|-----|-----|---|----|-----|----|
|                |               |                               |                                |                                                                                         |                                                        |                                                      |                               | UL               | CSA | CCC | S | DE | IEC | PS |
| 5HF (P) 100-R  | 100mA         | 3.85                          | 0.55                           | See Table of Safety Approvals on Page 1 for Voltage and associated Interrupting Ratings | 0.003                                                  | 0.002                                                | 0.30                          | Y                | Y   | Y   |   |    |     |    |
| 5HF (P) 125-R  | 125mA         | 2.52                          | 0.51                           |                                                                                         | 0.005                                                  | 0.004                                                | 0.36                          | Y                | Y   | Y   |   |    |     |    |
| 5HF (P) 160-R  | 160mA         | 1.59                          | 0.44                           |                                                                                         | 0.009                                                  | 0.008                                                | 0.43                          | Y                | Y   | Y   |   |    |     |    |
| 5HF (P) 200-R  | 200mA         | 1.22                          | 0.40                           |                                                                                         | 0.016                                                  | 0.014                                                | 0.52                          | Y                | Y   | Y   |   |    |     |    |
| 5HF (P) 250-R  | 250mA         | 0.90                          | 0.38                           |                                                                                         | 0.028                                                  | 0.026                                                | 0.63                          | Y                | Y   | Y   |   |    |     |    |
| 5HF (P) 315-R  | 315mA         | 0.67                          | 0.37                           |                                                                                         | 0.05                                                   | 0.05                                                 | 0.76                          | Y                | Y   | Y   |   |    |     |    |
| 5HF (P) 400-R  | 400mA         | 0.46                          | 0.34                           |                                                                                         | 0.09                                                   | 0.08                                                 | 0.92                          | Y                | Y   | Y   |   |    |     |    |
| 5HF (P) 500-R  | 500mA         | 0.34                          | 0.32                           |                                                                                         | 0.16                                                   | 0.15                                                 | 1.11                          | Y                | Y   | Y   |   |    |     |    |
| 5HF (P) 630-R  | 630mA         | 0.225                         | 0.29                           |                                                                                         | 0.29                                                   | 0.27                                                 | 1.35                          | Y                | Y   | Y   |   |    |     |    |
| 5HF (P) 800-R  | 800mA         | 0.192                         | 0.23                           |                                                                                         | 0.36                                                   | 0.35                                                 | 0.58                          | Y                | Y   | Y   |   |    |     |    |
| 5HF (P) 1-R    | 1A            | 0.139                         | 0.19                           |                                                                                         | 0.65                                                   | 0.63                                                 | 0.69                          | Y                | Y   | Y   | Y | Y  | Y   | Y  |
| 5HF (P) 1.25-R | 1.25A         | 0.097                         | 0.17                           |                                                                                         | 1.2                                                    | 1.2                                                  | 0.81                          | Y                | Y   | Y   | Y | Y  | Y   | Y  |
| 5HF (P) 1.6-R  | 1.6A          | 0.072                         | 0.16                           |                                                                                         | 2.1                                                    | 2.1                                                  | 0.96                          | Y                | Y   | Y   | Y | Y  | Y   | Y  |
| 5HF (P) 2-R    | 2A            | 0.052                         | 0.14                           |                                                                                         | 3.8                                                    | 3.8                                                  | 1.1                           | Y                | Y   | Y   | Y | Y  | Y   | Y  |
| 5HF (P) 2.5-R  | 2.5A          | 0.039                         | 0.13                           |                                                                                         | 6.8                                                    | 6.8                                                  | 1.3                           | Y                | Y   | Y   | Y | Y  | Y   | Y  |
| 5HF (P) 3.15-R | 3.15A         | 0.029                         | 0.13                           |                                                                                         | 12                                                     | 12                                                   | 1.6                           | Y                | Y   | Y   | Y | Y  | Y   | Y  |
| 5HF (P) 4-R    | 4A            | 0.022                         | 0.13                           |                                                                                         | 22                                                     | 22                                                   | 1.9                           | Y                | Y   | Y   | Y | Y  | Y   | Y  |
| 5HF (P) 5-R    | 5A            | 0.016                         | 0.13                           |                                                                                         | 39                                                     | 40                                                   | 2.2                           | Y                | Y   | Y   | Y | Y  | Y   | Y  |
| 5HF (P) 6.3-R  | 6.3A          | 0.011                         | 0.10                           |                                                                                         | 70                                                     | 73                                                   | 2.7                           | Y                | Y   | Y   | Y | Y  | Y   |    |
| 5HF (P) 8-R    | 8A            | 0.010                         | 0.11                           |                                                                                         | 126                                                    | 131                                                  | 3.1                           | Y                | Y   | Y   | Y |    |     |    |
| 5HF (P) 10-R   | 10A           | 0.007                         | 0.10                           |                                                                                         | 227                                                    | 238                                                  | 3.7                           | Y                | Y   | Y   | Y |    |     |    |
| 5HF (P) 12-R   | 12A           | 0.005                         | 0.09                           |                                                                                         | 408                                                    | 430                                                  | 4.4                           |                  |     |     | Y |    |     |    |

Consult manufacturer for other ratings

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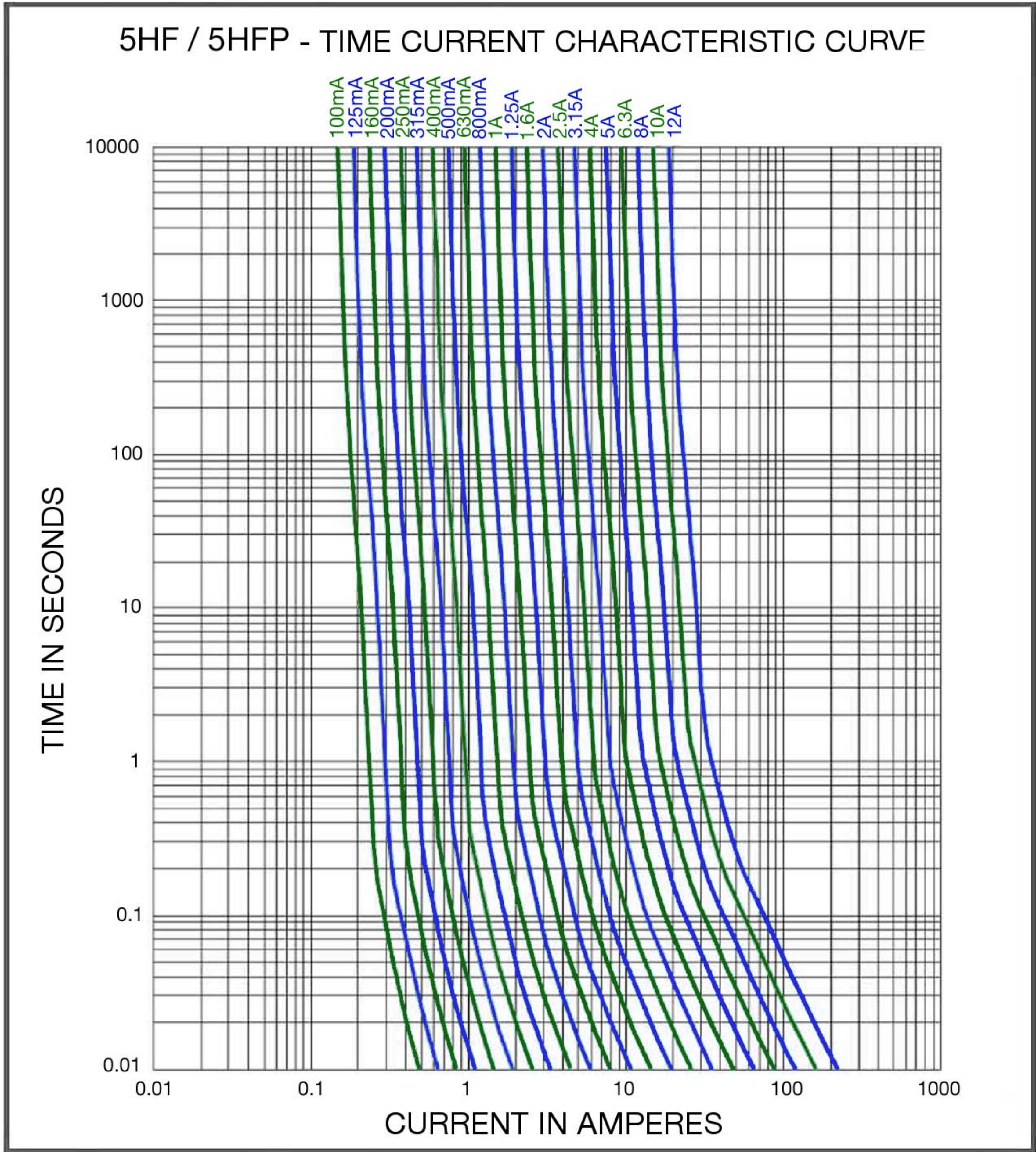
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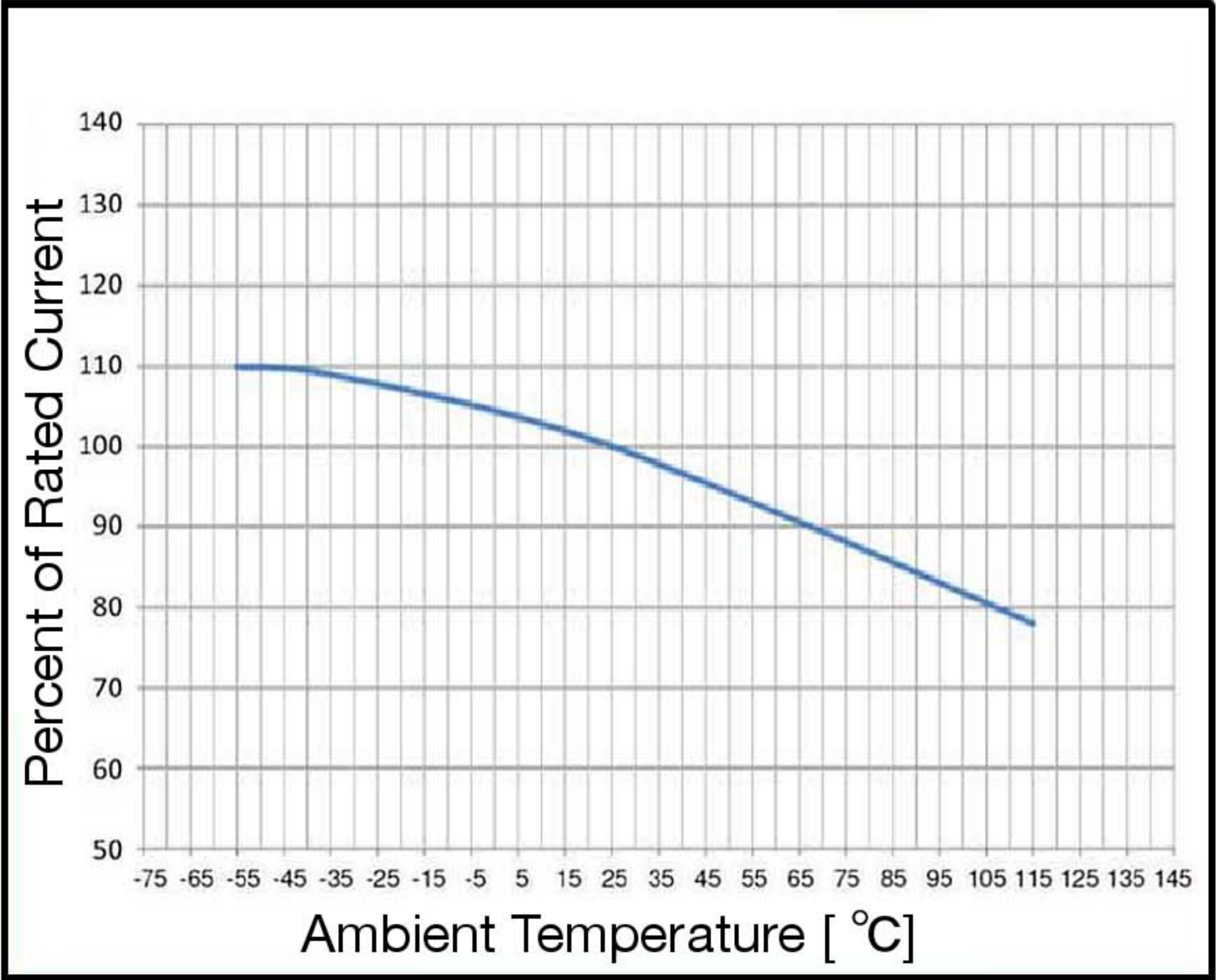
HF 5HF/5HFP Series, 5x20mm Ceramic Tube Quick-acting Fuse

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### Average Time Current Curve

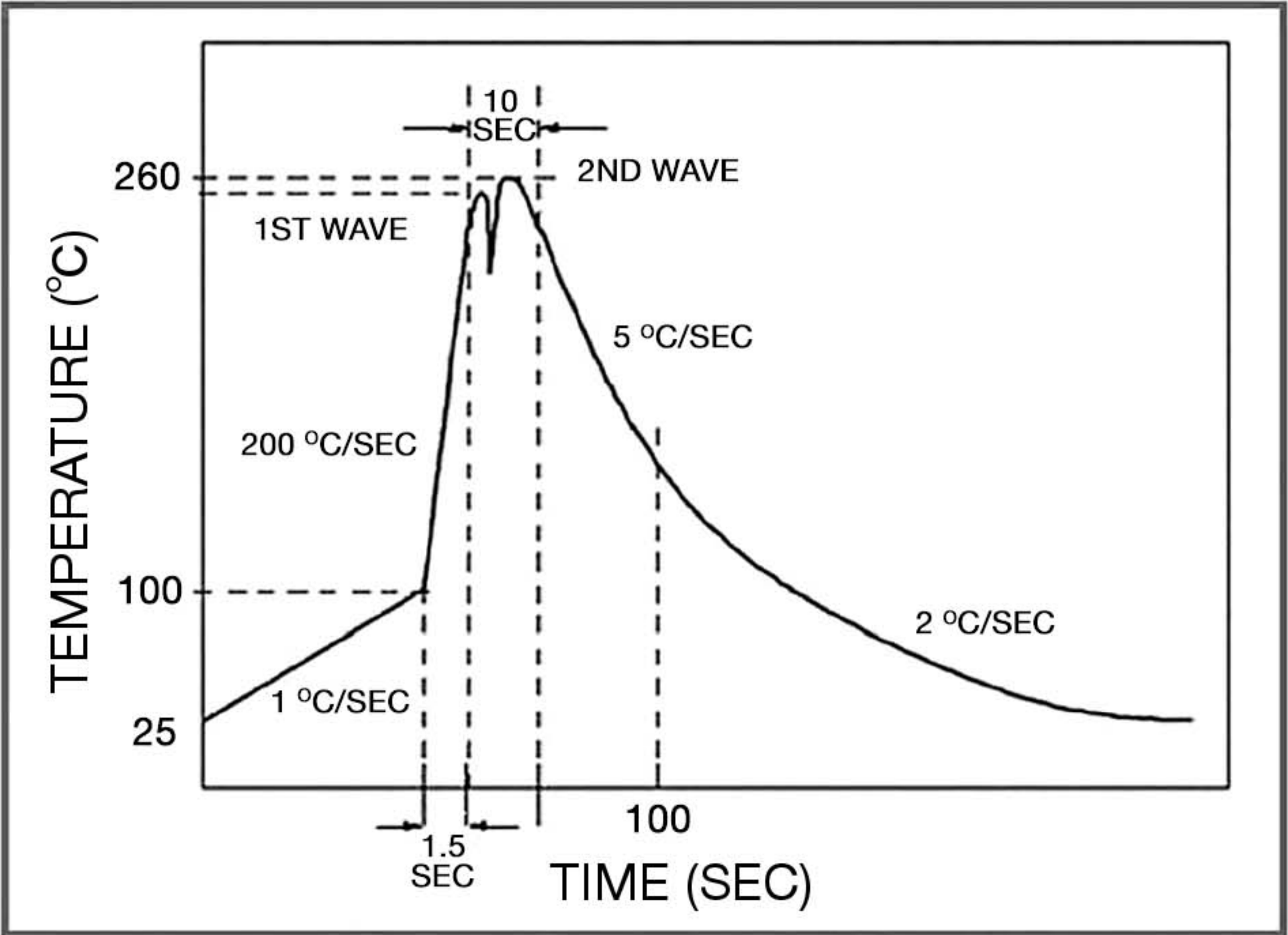


### Temperature Derating Curve



### 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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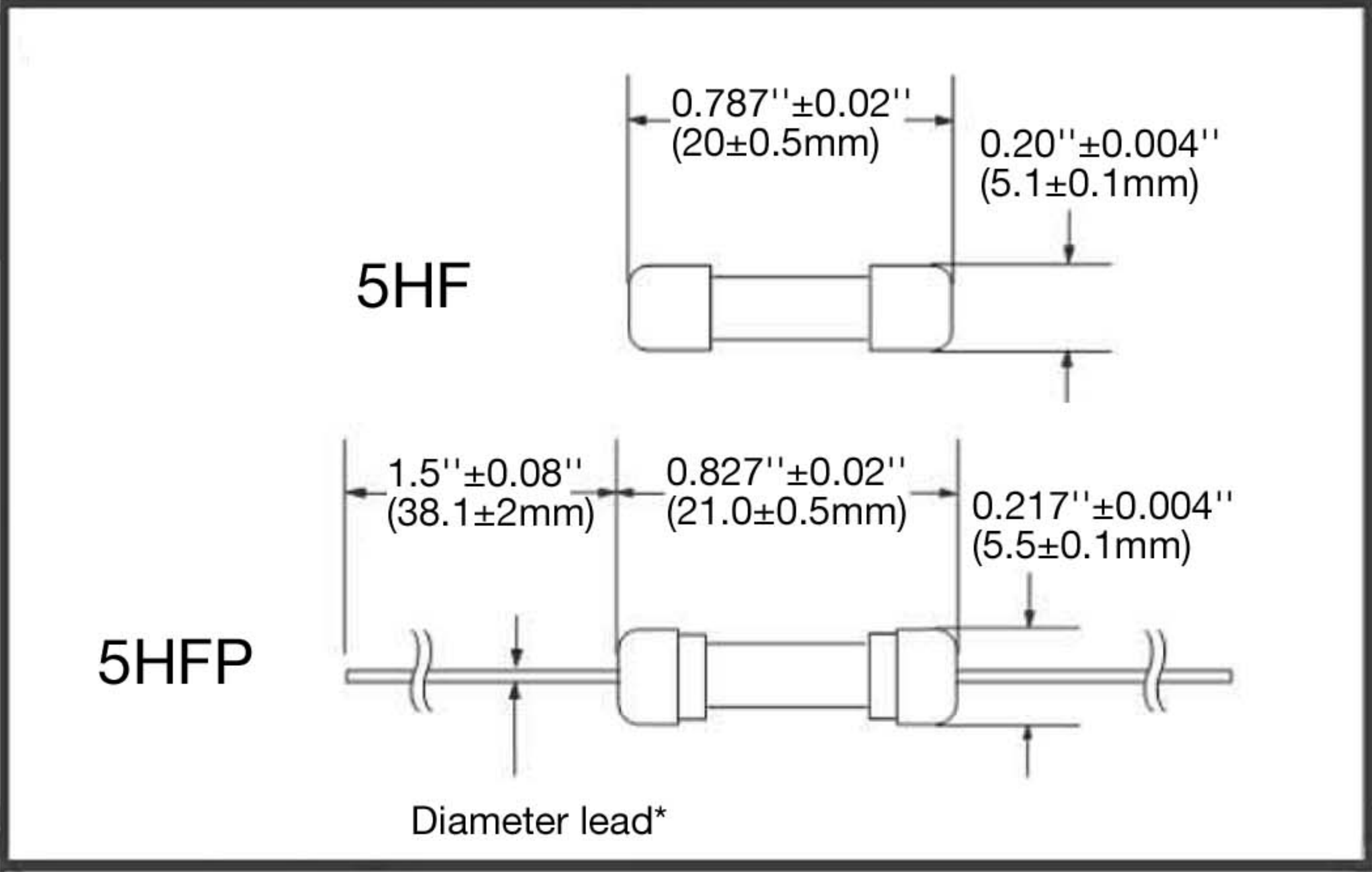
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### Fuse FGNO Explanation 06XX X [XXXX] X XX, [XXXX]=Ampere Rating

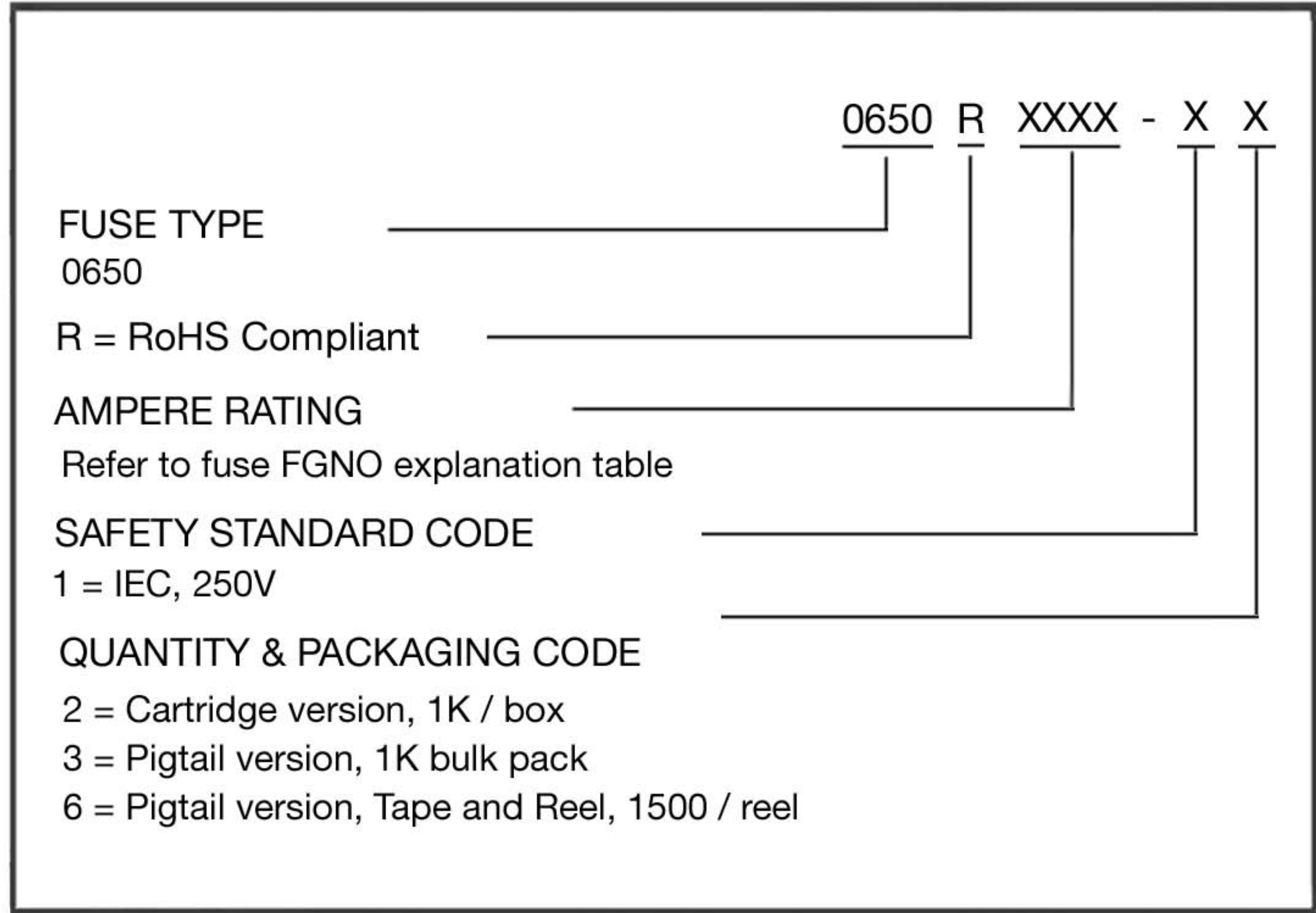
| Fraction | Decimal | Milliamps | Bel FGNO[XXXX] | Fraction | Decimal | Amps | Bel FGNO[XXXX] |
|----------|---------|-----------|----------------|----------|---------|------|----------------|
| 1/32     | 0.032   | 32        | 0032           | 1.0      | 1.0     | 1    | 1000           |
| 1/25     | .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 6.3A and less have 0.032" diameter lead  
\*Ratings 8A and above have 0.040" diameter lead

### Ordering Information



### Packaging

| Packaging Option         | Packaging Specification | Quantity | Packaging Code | Inside Tape Spacing |
|--------------------------|-------------------------|----------|----------------|---------------------|
| Bulk                     | N/A                     | 1000     | 12             | N/A                 |
| Bulk ( Pigtail Type )    | N/A                     | 1000     | 13             | N/A                 |
| Tape & Reel, 10 mm Pitch | EIA-296-F               | 1500     | 16             | 63                  |

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