

# Type MRF

## Fast Acting Radial Lead Micro Fuse Series

HF (Pb) MRF Series

RoHS 6 Compliant

### Description

Sub-miniature, fast-acting type, 250V rated fuses designed, approved and complied with IEC 60127-3, standard sheet 3.

### Features



- Fast Acting (250V AC@50A)
- Meet IEC standard 60127-3, sheet 3
- Wide operating temperature range
- Bulk and Tape & Reel packing available
- RoHS 6 compliant
- Halogen Free
- Leadfree

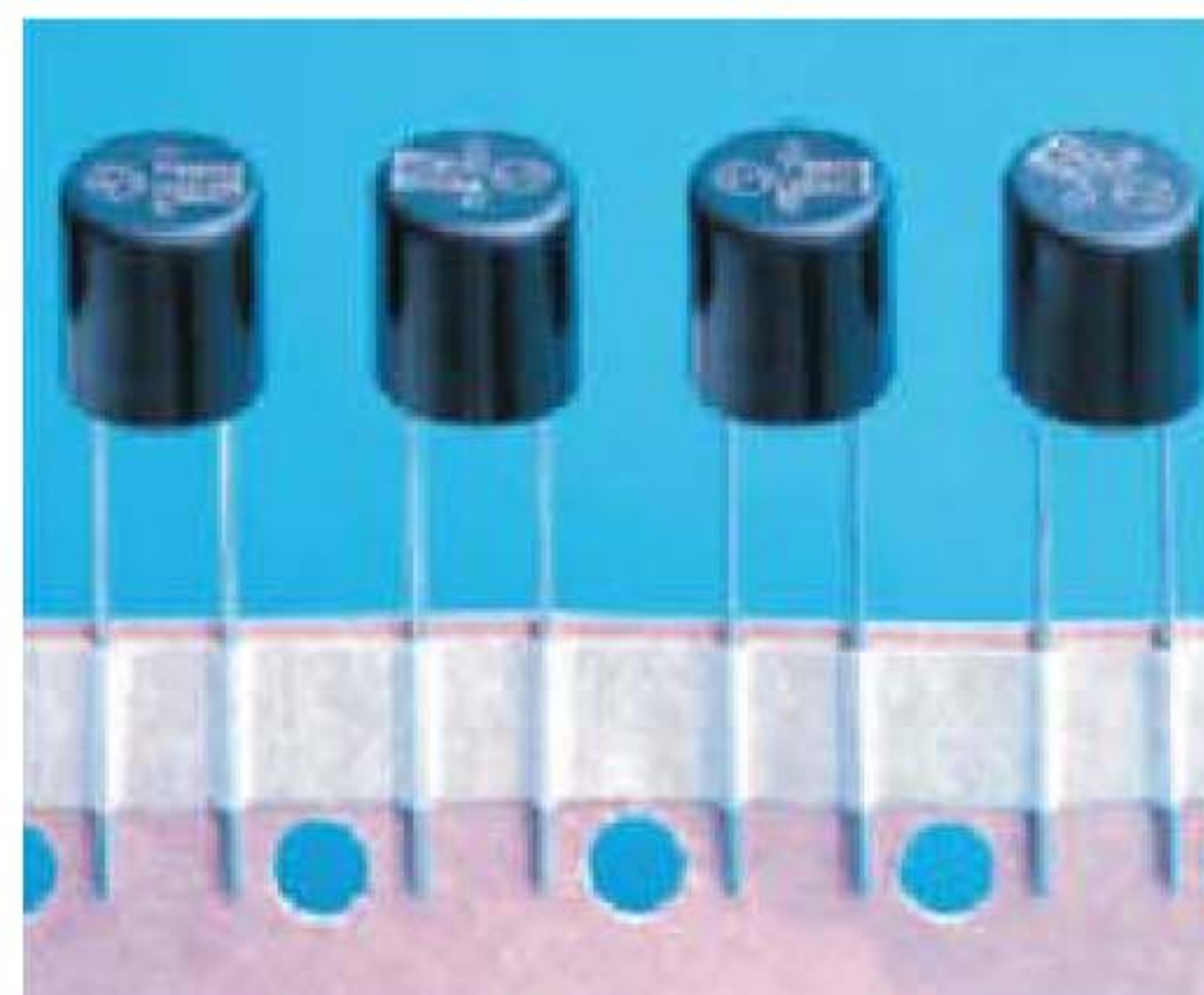
### Applications

- Provide individual protection for components or internal circuits.
- Power supplies
  - Battery chargers
  - Consumer Electronics
  - Adapter
  - Industrial Controllers

LEAD FREE = (Pb)  
HALOGEN FREE = HF

### Physical Specifications

|           |  |
|-----------|--|
| Materials | Base and Cover : Black thermoplastic, UL 94-V0   |
|           | Pins : 100% Matte Tin Plated Copper  |
| Marking   | On Fuse :  |
|           | "bel", "F", "Current Rating", "250V" & " Appropriate Safety Logos"   |
|           | On Label :   |
|           | "bel", "MRF", "Current Rating", "Voltage Rating", "Interrupting Rating", " Appropriate Safety Logos" and "  ", "  "(China RoHS compliant). |









### Electrical Characteristics (IEC-127-3 STANDARD SHEET 3)

| Rated Current          | 1.5 In |         | 2.1 In |       | 2.75 In |        | 4 In |     | 10 IN |
|------------------------|--------|---------|--------|-------|---------|--------|------|-----|-------|
|                        | MIN    | MAX     | MIN    | MAX   | MIN     | MAX    | MIN  | MAX | MAX   |
| 50mA to 6.3A inclusive | 1 hr.  | 30 min. | 10 ms  | 3 sec | 3 ms    | 300 ms |      |     | 20 ms |

In clause 9.2, the test voltage for MRF ratings from 80mA to 6.3A is 64VDC.

### Safety Agency Approvals

| SAFETY AGENCY  | SAFETY AGENCY CERTIFICATE NUMBER   | VOLTAGE RATING (V)    | AMPERE RANGE / VOLT @ I.R. ABILITY*                     |
|--|------------------------------------|-----------------------|---|
|  | 1026142;1026141<br>1026139;1111865 | 50mA - 6.3A / 250V AC | 50mA - 5A / 250V AC @ 35A or 10 In whichever is greater |
|  | 40017420                           |                       | 6.3A / 250V ac @ 63A                                    |
|  | 40028500                           |                       | 50mA - 6.3A / 250V AC @ 50A                             |
|  | LR39772                            |                       | 50mA - 6.3A / 350V AC @ 100A                            |
|  | E20624                             |                       | 1A - 5A / 250V AC @ 100A                                |
|  | JET 1037-31007-1001                |                       |   |

\* 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 X 3 axis / no load).  |
| Salt Spray Resistance     | MIL-STD-202G, Method 101E, Test Condition B(48 hrs).   |
| Solderability             | MIL-STD-202G, Method 208H  |
| Resistance to solder Heat | MIL-STD-202G, Method 210F, Test Condition C. Top Side.(260 °C,20 sec)                            |
| Moisture Resistance       | MIL-STD-202G, Method 202G, Method 106G   |
| Operating Temperature     | -55 °C to +125 °C  |

### 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 US            | CSA | S | DVE | VDE | PS E |
| MRF 50         | 50mA          | 11.9                          | 0.73                           | See Table of Safety Approvals on Page 1 for Voltage and associated Interrupting Ratings | 0.001  | 0.001  | 0.09                          | Y                | Y   | Y | Y   |     |      |
| MRF 63         | 63mA          | 8.5                           | 0.66                           |   | 0.001  | 0.001  | 0.10                          | Y                | Y   | Y | Y   |     |      |
| MRF 80         | 80mA          | 6.3                           | 0.64                           |   | 0.002  | 0.002  | 0.11                          | Y                | Y   | Y | Y   |     |      |
| MRF 100        | 100mA         | 4.0                           | 0.49                           |   | 0.003  | 0.003  | 0.11                          | Y                | Y   | Y | Y   |     |      |
| MRF 125        | 125mA         | 3.1                           | 0.50                           |   | 0.007  | 0.007  | 0.13                          | Y                | Y   | Y | Y   |     |      |
| MRF 160        | 160mA         | 2.3                           | 0.46                           |   | 0.016  | 0.016  | 0.21                          | Y                | Y   | Y | Y   |     |      |
| MRF 200        | 200mA         | 1.7                           | 0.41                           |   | 0.027  | 0.027  | 0.19                          | Y                | Y   | Y | Y   |     |      |
| MRF 250        | 250mA         | 0.42                          | 0.17                           |   | 0.023  | 0.023  | 0.23                          | Y                | Y   | Y | Y   |     |      |
| MRF 315        | 315mA         | 0.29                          | 0.15                           |   | 0.044  | 0.044  | 0.22                          | Y                | Y   | Y | Y   |     |      |
| MRF 400        | 400mA         | 0.21                          | 0.14                           |   | 0.073  | 0.072  | 0.28                          | Y                | Y   | Y | Y   |     |      |
| MRF 500        | 500mA         | 0.17                          | 0.15                           |   | 0.20   | 0.18   | 0.42                          | Y                | Y   | Y | Y   |     |      |
| MRF 630        | 630mA         | 0.10                          | 0.08                           |   | 0.15   | 0.14   | 0.16                          | Y                | Y   | Y | Y   |     |      |
| MRF 800        | 800mA         | 0.071                         | 0.08                           |   | 0.4  | 0.4  | 0.20                          | Y                | Y   | Y | Y   |     |      |
| MRF 1          | 1A            | 0.057                         | 0.08                           |   | 0.7  | 0.6  | 0.38                          | Y                | Y   | Y | Y   |     | Y    |
| MRF 1.25       | 1.25A         | 0.047                         | 0.081                          |   | 1.3  | 1.2  | 0.69                          | Y                | Y   | Y | Y   |     | Y    |
| MRF 1.6        | 1.6A          | 0.035                         | 0.077                          |   | 1.4  | 1.3  | 0.62                          | Y                | Y   | Y | Y   |     | Y    |
| MRF 2          | 2A            | 0.028                         | 0.075                          |   | 2.1  | 2.0  | 0.72                          | Y                | Y   | Y | Y   |     | Y    |
| MRF 2.5        | 2.5A          | 0.022                         | 0.071                          |   | 4  | 3  | 0.92                          | Y                | Y   | Y | Y   |     | Y    |
| MRF 3.15       | 3.15A         | 0.016                         | 0.064                          |   | 6  | 4  | 0.82                          | Y                | Y   | Y | Y   |     | Y    |
| MRF 4          | 4A            | 0.011                         | 0.059                          |   | 8  | 6  | 0.65                          | Y                | Y   | Y | Y   |     | Y    |
| MRF 5          | 5A            | 0.010                         | 0.056                          |   | 15   | 11.8   | 0.91                          | Y                | Y   | Y | Y   |     | Y    |
| MRF 6.3        | 6.3A          | 0.008                         | 0.054                          |   | 25   | 19.8   | 1.05                          | Y                | Y   |   |     | Y   |      |

Consult manufacturer for other ratings

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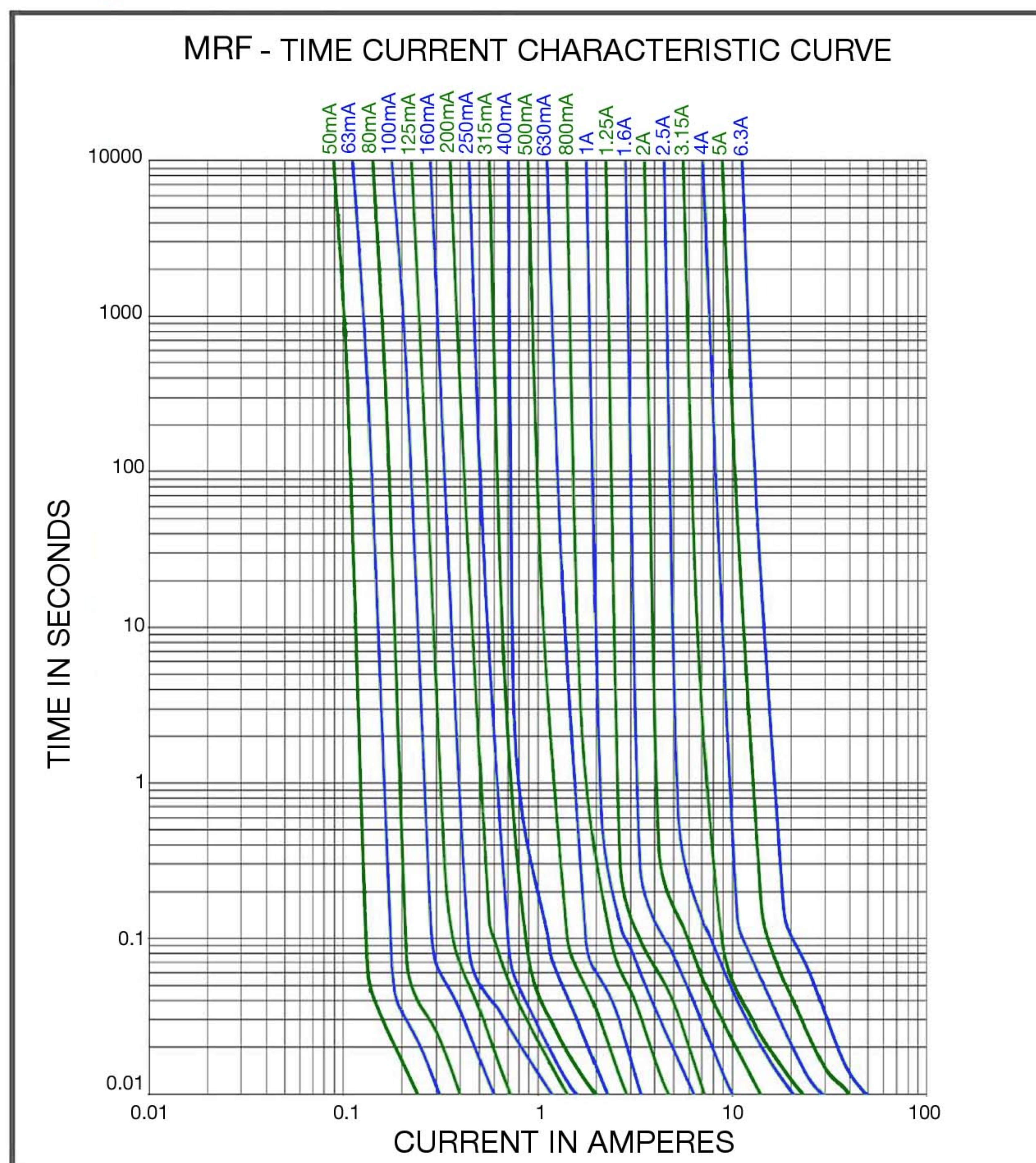
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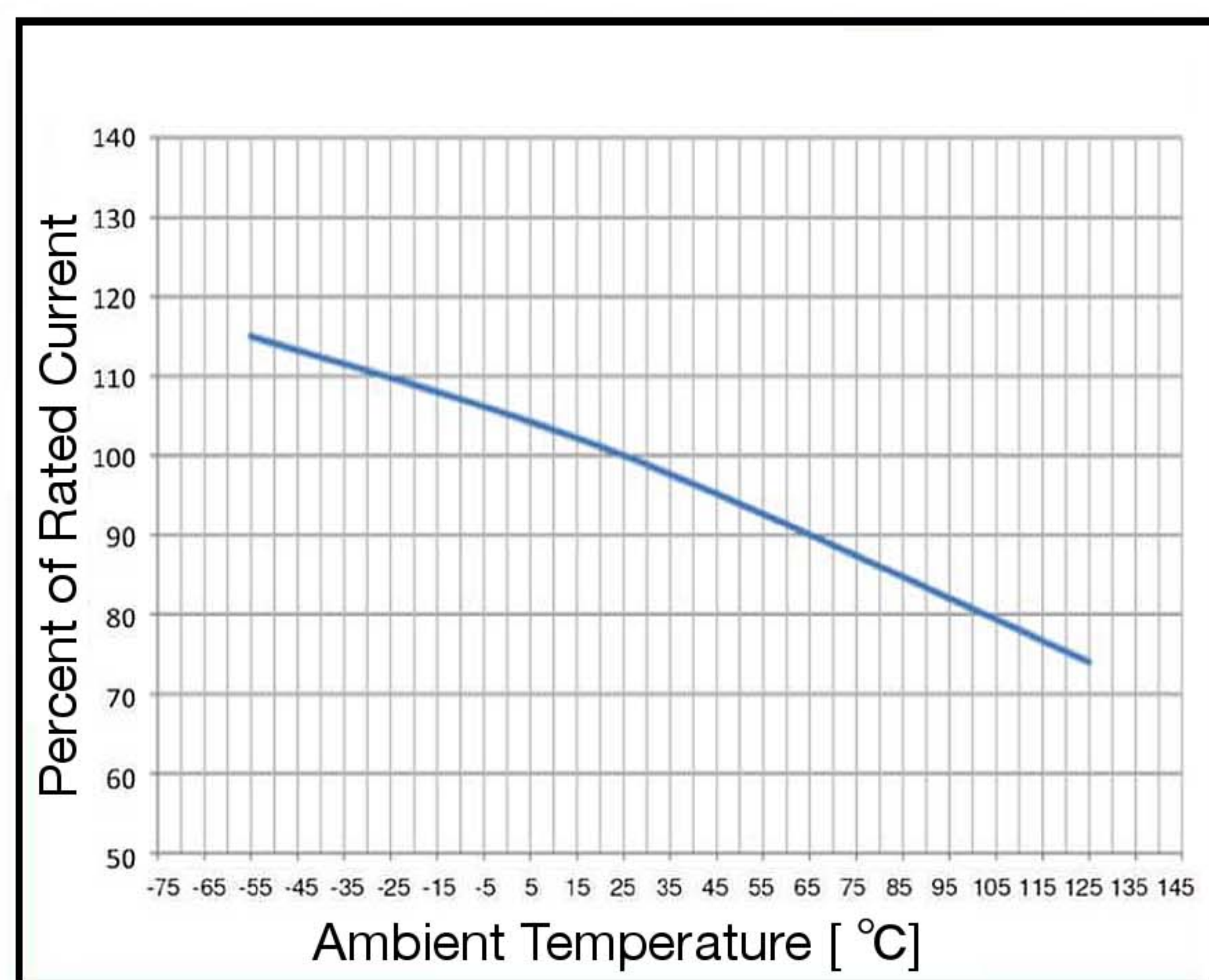
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### Average Time Current Curve

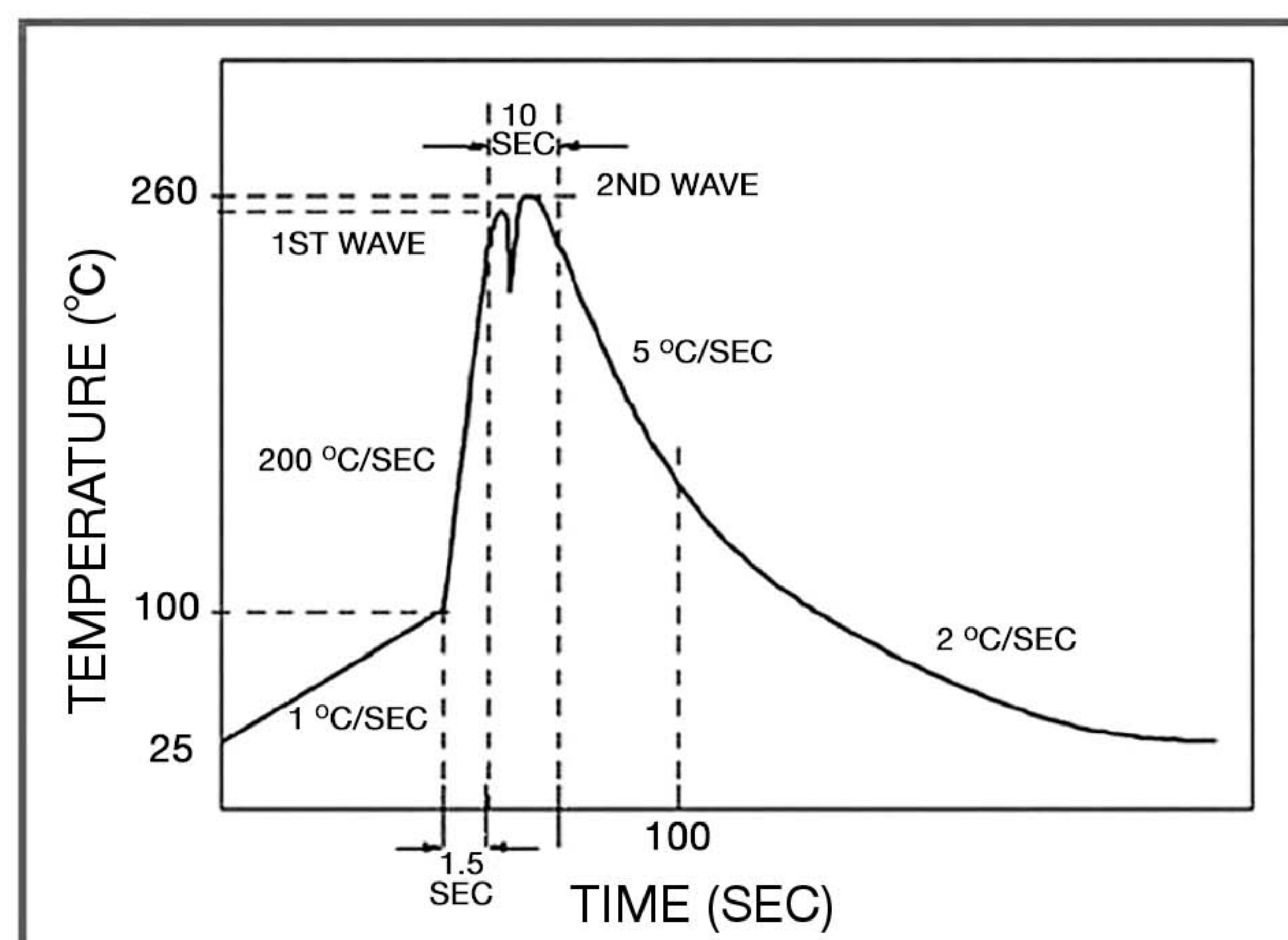


### Temperature Derating Curve



### 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 T <sub>p</sub>                      | 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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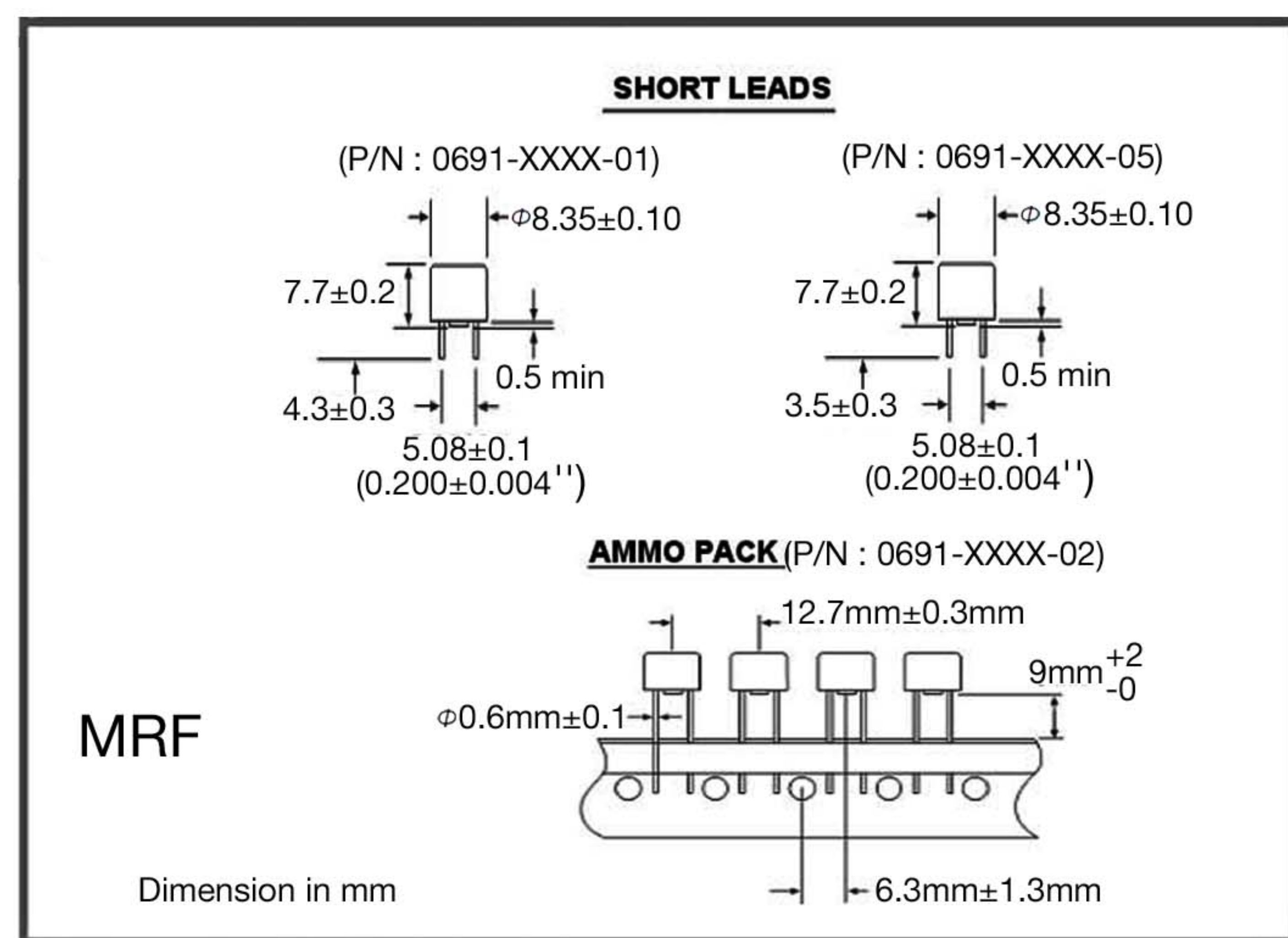
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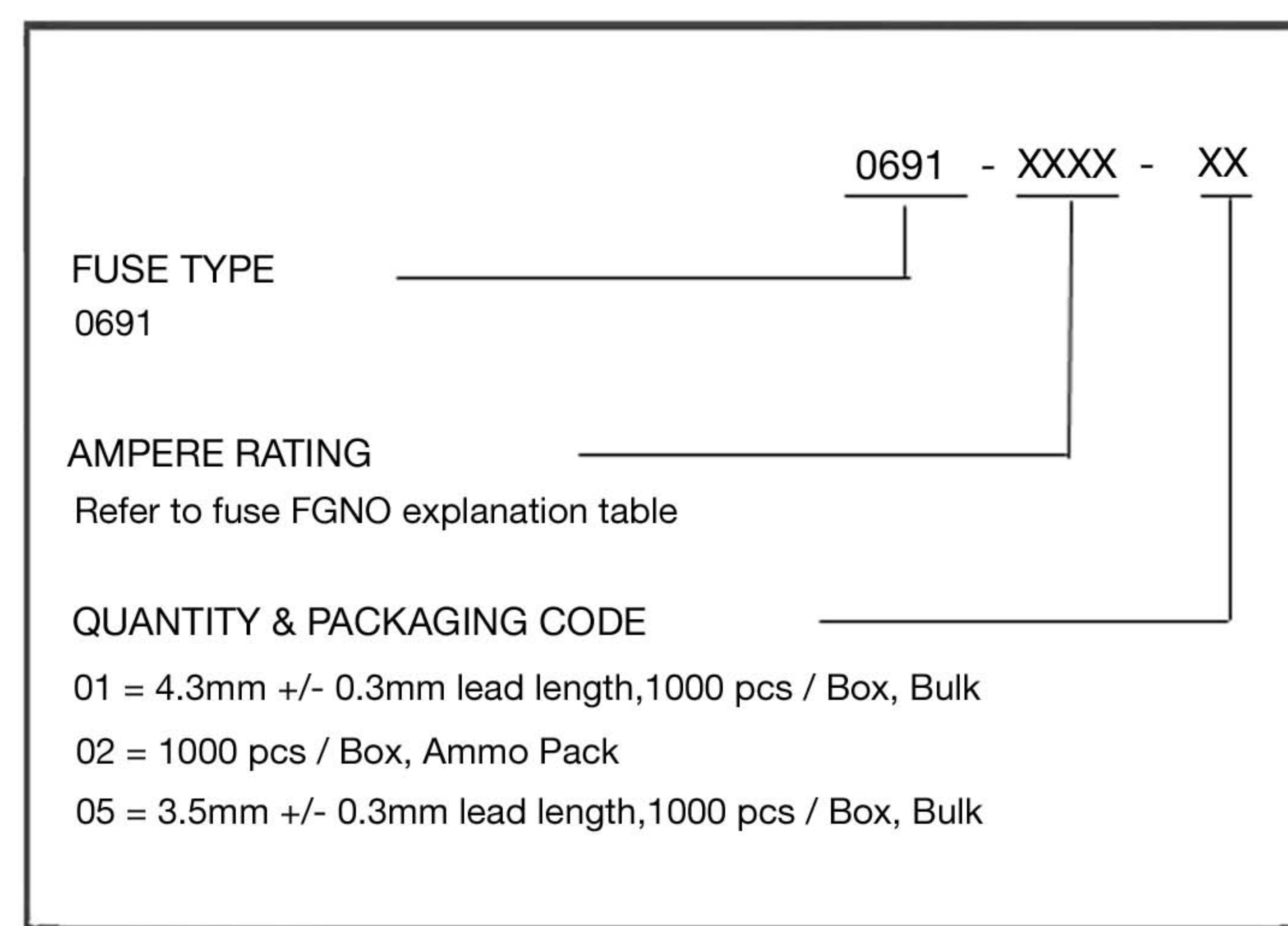
### Fuse FGNO Explanation 06XX X [XXXX] X XX, [XXXX]=Ampere Rating

| 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



### Ordering Information



### Packaging

| Packaging Option             | Packaging Specification | Quantity | Packaging Code |
|------------------------------|-------------------------|----------|----------------|
| Bulk / bag, 1000 / box       | N/A                     | 1000     | 01 , 05        |
| 12.7 mm pitch, On Tape / box | IEC-286-2               | 1000     | 02             |

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