

## Type SMP

### Surface Mount Power Cross Protection Fuse

**HF** **Pb** SMP Series - 3912 Size

RoHS 2 Compliant

#### Description

SMP Surface mount Power Cross Protection Fuses are primarily intended for use in telecommunication circuit applications requiring low current protection with high surge tolerance.

These fuses will withstand transient surge currents generated by lightning in accordance with the attached table.

SMP fuse guard protected circuitry against sustained overload or short circuit conditions. Such sustained overloads may be generated by accidental contact between utility cables and phone lines (power line cross).

SMP fuse are intended for use in circuits which require compliance with the test requirements specified in UL/IEC 1950/60950 and Telcordia GR 1089, Issue 3.

#### Features

- Surface mount power cross protection fuse.
- Designed to allow compliance with Telcordia GR-1089-Core
- Designed to serve the requirements of a wide range of telecommunication and networking equipment.
- Product is RoHS 6 Compliant

LEAD FREE = **Pb**

HALOGEN FREE = **HF**

#### 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 J.(235 °C ,30 sec)                                     |
| Thermal Shock              | MIL-STD-202G, Method 107G, Test Condition B (-65 °C to +125 °C).                                 |
| Operating Temperature      | -55 °C to +125 °C  |
| Moisture Sensitivity Level | 1 ( Peak Temperature at 240 °C for 30 seconds max )  |



#### Safety Agency Approvals

| SAFETY AGENCY | SAFETY AGENCY CERTIFICATE | VOLTAGE RATING (V)            | AMPERE RANGE / VOLT @ I.R. ABILITY*         |
|---------------|---------------------------|-------------------------------|---|
| <b>UL US</b>  | E20624                    | 500mA - 2A/125V DC<br>600V AC | 500mA - 2A /125V @ 100A DC<br>600V @ 60A AC |

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

Caution – see soldering parameters and note on Page 3.

#### Physical Specifications

|           |  |
|-----------|--|
| Materials | Body : Ceramic   |
|           | Terminations : Matte Tin plated Brass Caps (100% Lead-free)  |
| Marking   | On Fuse :<br>"bel", "Current Rating" in black color.   |
|           | On Label :<br>"bel", "SMP", "Current Rating", "Voltage Rating", "Interrupting Rating", "Appropriate Safety Logos" and "UL", "CE" (China RoHS compliant). |

Specifications subject to change without notice



Bel Fuse Inc. +1 201.432.0463  
206 Van Vorst Street Bel.US.CS@belf.com  
Jersey City, NJ 07302 USA [belfuse.com/circuit-protection](http://belfuse.com/circuit-protection)

EOL - Last Buy Date is June 30, 2018

# Type SMP

## Surface Mount Power Cross Protection Fuse

HF  SMP Series - 3912 Size

RoHS 2 Compliant

### AC Power fault Tests

| GR-1089<br>1st Level<br>Test | Voltage<br>(Vrms) | Short Circuit<br>Current<br>(A) | Applications | Durations  | Time For Fuse To Open |               |               |
|------------------------------|-------------------|---------------------------------|--------------|------------|-----------------------|---------------|---------------|
|                              |                   |                                 |              |            | SMP 500               | SMP 1.25      | SMP 2         |
| 1                            | 50                | 0.33                            | 1            | 15 minutes | Will not open         | Will not open | Will not open |
| 2                            | 100               | 0.17                            | 1            | 15 minutes | Will not open         | Will not open | Will not open |
| 3                            | 200,400,600       | 1                               | 60           | 1 Sec      | Will not open         | Will not open | Will not open |
| 4                            | 1000              | 1                               | 60           | 1 Sec      | Will not open         | Will not open | Will not open |
| 5                            | Diagram           | N/A For Fuses                   | 60           | 5 Sec      | N/A                   | N/A           | N/A           |
| 6                            | 600               | 0.5                             | 1            | 30 Sec     | Will not open         | Will not open | Will not open |
| 7                            | 440               | 2.2                             | 5            | 2 Sec      | Will open             | Will not open | Will not open |
| 8                            | 600               | 3                               | 5            | 1.1 Sec    | Will open             | Will not open | Will not open |
| 9                            | 1000              | 5                               | 5            | 0.4 Sec    | Will open             | Will not open | Will not open |


### Lightning Surge Withstand Capabilities

| Max. Rise /<br>Min. Decay<br>(us) | Repetitions |               | Minimum<br>Peak<br>Voltage<br>(V) | Minimum Withstand<br>Peak Current (A) |          |       |
|-----------------------------------|-------------|---------------|-----------------------------------|---------------------------------------|----------|-------|
|                                   | Total       | Each Polarity |                                   | SMP 500                               | SMP 1.25 | SMP 2 |
| 10/1000                           | 50          | 25            | 600                               | 25                                    | 115      | 120   |
| 10/360                            | 50          | 25            | 1000                              | 30                                    | 125      | 150   |
| 10/1000                           | 50          | 25            | 1000                              | 25                                    | 110      | 120   |
| 2/10                              | 20          | 10            | 2500                              | 120                                   | 500      | 600   |
| 10/360                            | 10          | 5             | 1000                              | 30                                    | 125      | 150   |
| 2/10                              | 2           | 1             | 5000                              | 120                                   | 500      | 600   |
| 8/20                              | 2           | 1             | 5000                              | 75                                    | 300      | 350   |

### AC Current Limiting Protector Tests / Fusing Coordination Tests

| Voltage<br>(Vac) | Current<br>(A) | Duration         | Time For Fuse To Open |               |               |
|------------------|----------------|------------------|-----------------------|---------------|---------------|
|                  |                |                  | SMP 500               | SMP 1.25      | SMP 2         |
| 600V             | 2.2            | Up to 15 Minutes | 1.0 Sec Max.          | 900 Sec Max.  | Will not open |
| 600V             | 2.6            |                  | 0.8 Sec Max.          | 50 Sec Max.   | 2000 Sec Max. |
| 600V             | 3              |                  | 0.5 Sec Max.          | 10 Sec Max.   | 100 Sec Max.  |
| 600V             | 3.75           |                  | 0.3 Sec Max.          | 5 Sec Max.    | 10 Sec Max.   |
| 600V             | 5              |                  | 0.2 Sec Max.          | 2 Sec Max.    | 3 Sec Max.    |
| 600V             | 7              |                  | 0.08 Sec Max.         | 1 Sec Max.    | 2 Sec Max.    |
| 600V             | 10             |                  | 0.04 Sec Max.         | 0.5 Sec Max.  | 0.7 Sec Max.  |
| 600V             | 12.5           |                  | 0.01 Sec Max.         | 0.2 Sec Max.  | 0.3 Sec Max.  |
| 600V             | 20             |                  | 0.005 Sec Max.        | 0.07 Sec Max. | 0.1 Sec Max.  |
| 600V             | 25             |                  | 0.004 Sec Max.        | 0.04 Sec Max. | 0.07 Sec Max. |
| 600V             | 30             |                  | 0.003 Sec Max.        | 0.02 Sec Max. | 0.05 Sec Max. |

### Electrical Specifications

| Catalog<br>Number | Ampere<br>Rating<br>(A) | Typical<br>Cold<br>Resistance<br>(ohm) | Volt-drop<br>@100% In<br>(Volt) max. | Voltage and Interrupting Ratings  | Melting I <sup>2</sup> T<br><10m Sec<br>(A <sup>2</sup> Sec) | Melting I <sup>2</sup> T<br>@10 In<br>(A <sup>2</sup> Sec) | Maximum<br>Power<br>Dissipation<br>(W) | Agency Approvals  |
|-------------------|-------------------------|--|--------------------------------------|---|--|--|--|---|
|                   |                         |  |                                      |   |  |  |  |  |
| SMP 500           | 500mA                   | 0.320                                  | 0.25                                 | See Table of Safety Approvals<br>on Page 1 for Voltage and<br>associated Interrupting Ratings | 2.0  | 2.3  | 0.20                                   | Y   |
| SMP 1.25          | 1.25A                   | 0.079                                  | 0.16                                 |   | 14.0   | 17.0   | 0.40                                   | Y   |
| SMP 2             | 2A                      | 0.063                                  | 0.22                                 |   | 33.0   | 37.0   | 0.52                                   | Y   |

Consult manufacturer for other ratings

Specifications subject to change without notice



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

+1 201.432.0463  
Bel.US.CS@belf.com  
[belfuse.com/circuit-protection](http://belfuse.com/circuit-protection)

EOL - Last Buy Date is June 30, 2018

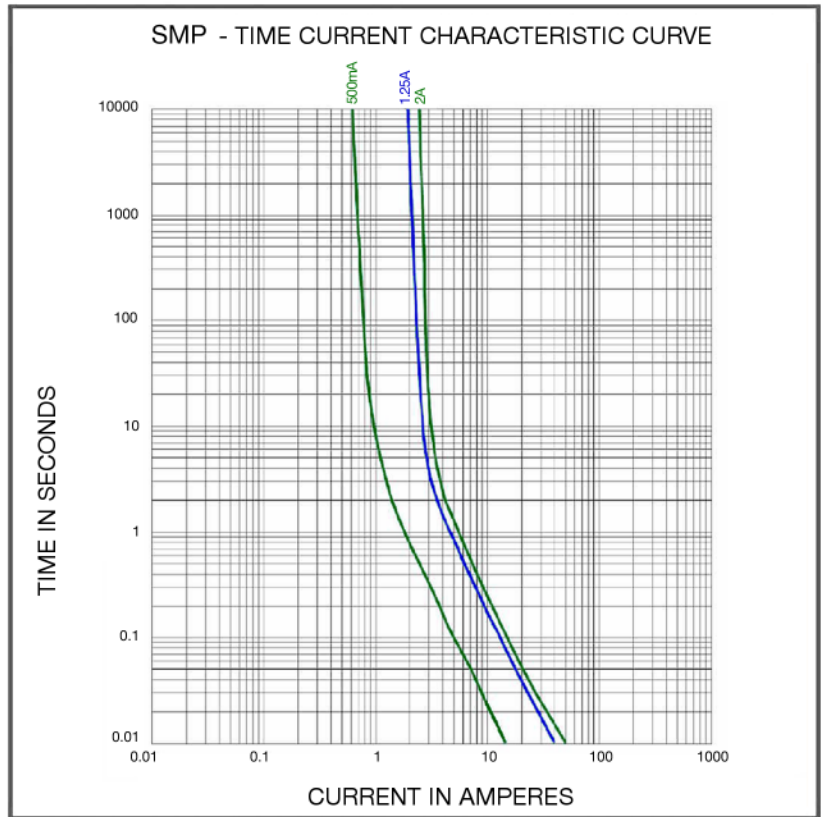
# Type SMP

## Surface Mount Power Cross Protection Fuse

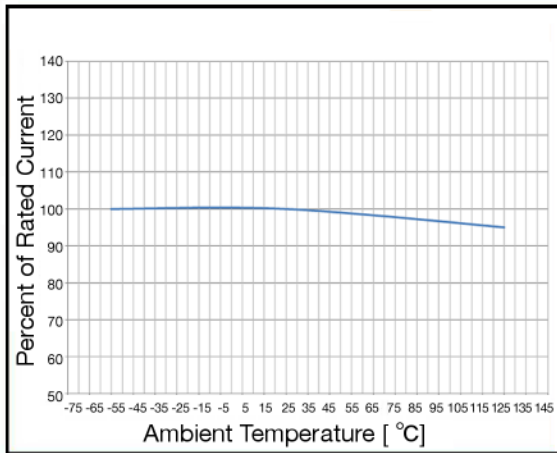
HF (Pb) SMP Series - 3912 Size

RoHS 2 Compliant

### Average Time Current Curve

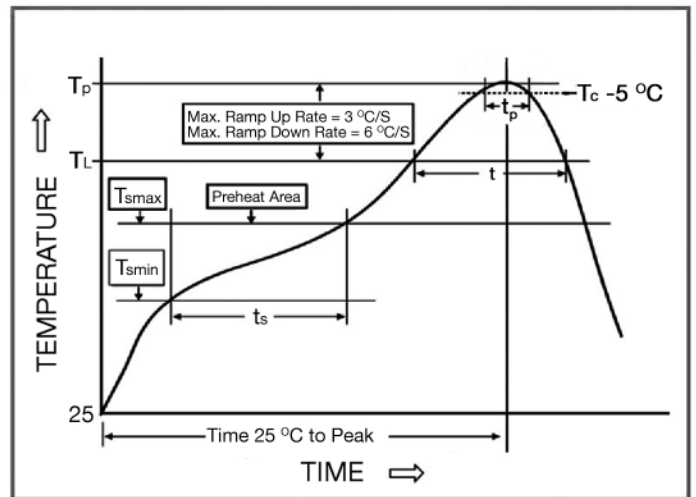


### Temperature Derating Curve



### Soldering Parameters

| IR Reflow Profile  |                   |
|--|-------------------|
| <b>Preheat &amp; Soak</b>  |                   |
| Temperature min ( $T_{smin}$ )   | 150 °C            |
| Temperature max ( $T_{smax}$ )   | 200 °C            |
| Time ( $T_{smin}$ to $T_{smax}$ ) ( $t_s$ )                                      | 60 - 120 seconds  |
| Average ramp-up rate ( $T_{smax}$ to $T_p$ )                                     | 3 °C/second max.  |
| Liquidous temperature ( $T_L$ )  | 217 °C            |
| Time at liquidous ( $t_L$ )  | 60 - 150 seconds  |
| Peak temperature ( $T_p$ )   | <b>240 °C max</b> |
| Time ( $t_p$ ) within 5 °C of the specified classification temperature ( $T_c$ ) | 30 seconds        |
| Average ramp-down rate ( $T_p$ to $T_{smax}$ )                                   | 6 °C/second max.  |
| Time 25 °C to peak temperature   | 8 minutes max.    |



Specifications subject to change without notice

### Soldering note :

Fuse function and reliability may be affected if Peak IR solder temperature exceeds 240 °C. Contact Bel factory for more details.



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

+1 201.432.0463  
Bel.US.CS@belf.com  
[belfuse.com/circuit-protection](http://belfuse.com/circuit-protection)

**EOL - Last Buy Date is June 30, 2018**

# Type SMP

## Surface Mount Power Cross Protection Fuse

**HF** **Pb** SMP Series - 3912 Size

**RoHS 2 Compliant**

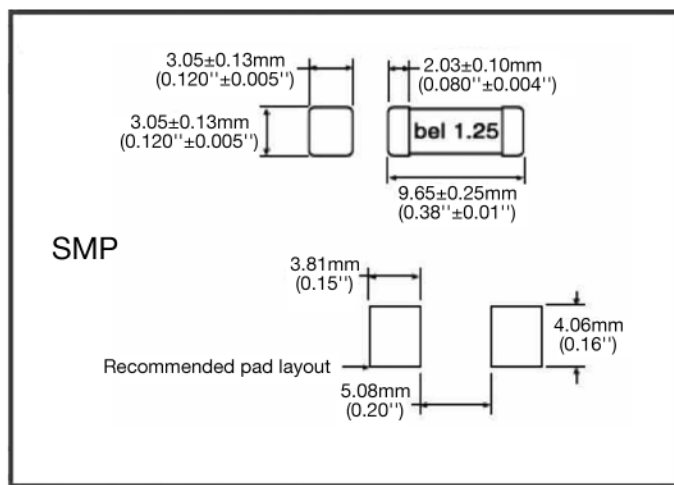
### Fuse FGNO Explanation

0678 - [XXXX] - XX

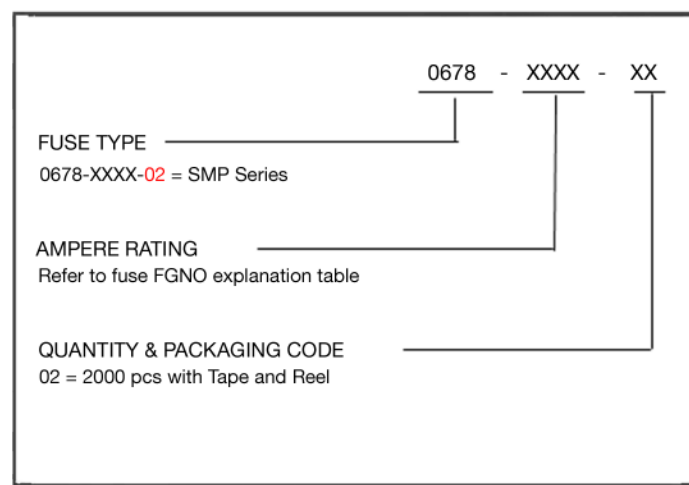
[XXXX]=Ampere Rating; XX=See Ordering Information as below

| Fraction | Decimal | Milliamps | Bel FGNO[XXXX] | Fraction | Decimal | Amps | Bel FGNO[XXXX] |
|----------|---------|-----------|----------------|----------|---------|------|----------------|
| 1/2      | 0.500   | 500       | 0500           | 1-1/4    | 1.25    | 1.25 | 1250           |
|          |         |           |                |          | 2.0     | 2    | 2000           |

### Mechanical Dimensions



### Ordering Information



### Packaging

| Packaging Tape & Reel                        | Packaging Specification | Quantity | Quantity & Packaging Code |
|--|-------------------------|----------|---------------------------|
| 16 mm wide tape with 13 inches Diameter reel | EIA Standard 481-E      | 2000     | 0678-XXXX-02              |

Specifications subject to change without notice



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

+1 201.432.0463  
Bel.US.CS@belf.com  
[belfuse.com/circuit-protection](http://belfuse.com/circuit-protection)