



## SinglFuse™ SF-3812FG-T Series Features

- Single blow fuse for overcurrent protection
- EIA 3812 (10030 metric) footprint
- Ceramic tube design for fast acting fusing speed and low voltage applications
- UL 248-14 compliant
- Surface mount packaging for automated assembly
- RoHS compliant\* and halogen free\*\*

## SF-3812FG-T Series – Fast Acting & Low Voltage SMD Fuses

### Clearing Time Characteristics for Series

| % of Current Rating | Clearing Time at 25 °C |            |
|---------------------|------------------------|------------|
|                     | Min.                   | Max.       |
| 100 %               | 4 hours                | —          |
| 200 %               | —                      | 60 seconds |

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### Electrical Characteristics

| Model            | Rated Current<br>(A) | Resistance<br>(Ω) Typ.*** | Rated<br>Voltage | Interrupting<br>Rating             | Typical<br>I <sup>2</sup> t (A <sup>2</sup> s) **** | Certifications               |
|------------------|----------------------|---------------------------|------------------|------------------------------------|-----------------------------------------------------|------------------------------|
|                  |                      |                           |                  |                                    |                                                     | cUL: <a href="#">E198545</a> |
| SF-3812FG2000T-2 | 20                   | 0.0033                    | 125 VAC          | 100 A @ 125 VAC<br>300 A @ 100 VDC | 18                                                  | ✓                            |
| SF-3812FG2500T-2 | 25                   | 0.0022                    |                  | 100 A @ 125 VAC<br>100 A @ 100 VDC | 45                                                  | ✓                            |
| SF-3812FG3000T-2 | 30                   | 0.0016                    |                  |                                    | 101                                                 | ✓                            |

\*\*\* Resistance value measured with ≤10 % rated current at 25 °C ambient. Tolerance ± 30 %.

\*\*\*\* Melting I<sup>2</sup>t calculated at 10 times rated current.

### Environmental Characteristics

|                                 |                                 |
|---------------------------------|---------------------------------|
| Operating Temperature.....      | -55 °C to +125 °C               |
| Storage Conditions              |                                 |
| Temperature .....               | +15 °C to +30 °C                |
| Humidity.....                   | 20 % to 70 %                    |
| Shelf Life.....                 | 2 years from manufacturing date |
| Moisture Sensitivity Level..... | 1                               |
| ESD Classification (HBM).....   | Class 6                         |

\*RoHS Directive 2015/863, Mar 31, 2015 and Annex.

\*\*Bourns considers a product to be "halogen free" if (a) the Bromine (Br) content is 900 ppm or less; (b) the Chlorine (Cl) content is 900 ppm or less; and (c) the total Bromine (Br) and Chlorine (Cl) content is 1500 ppm or less.

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and Reproductive Harm**  
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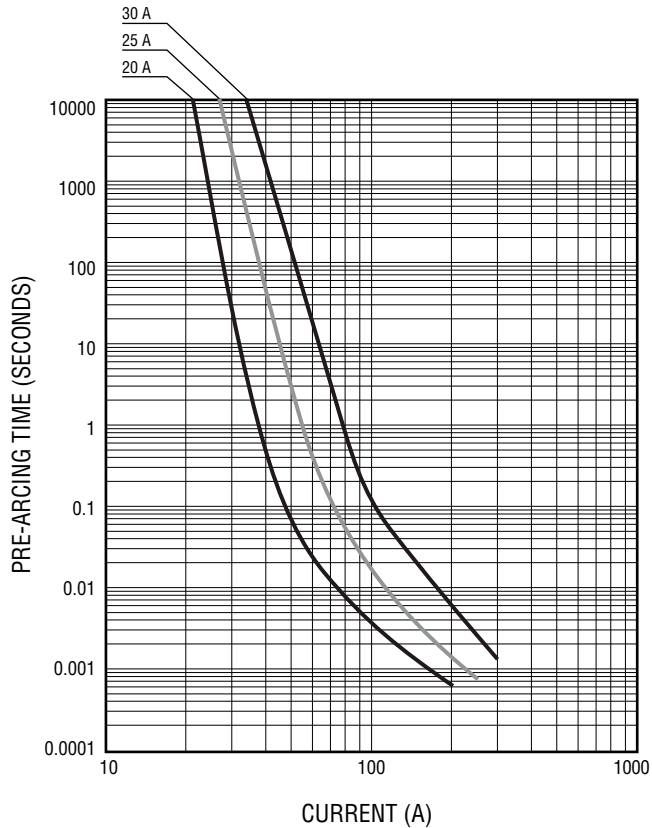
## SinglFuse™ SF-3812FG-T Series Applications

- Storage Systems
- PC Servers
- Voltage Regulator Modules
- Power Supplies

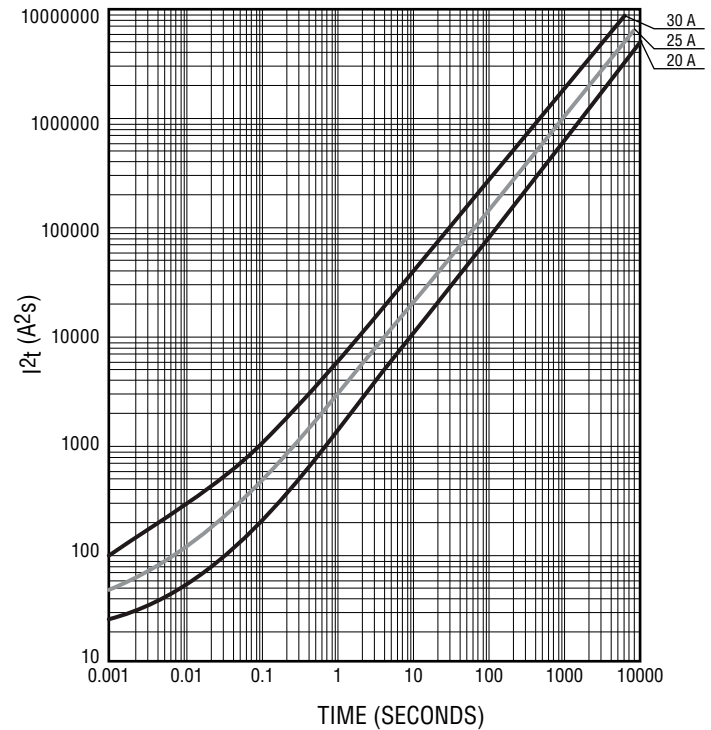
### SF-3812FG-T Series – Fast Acting & Low Voltage SMD Fuses

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Average Pre-Arcing Time vs. Current Curves



Average  $I^2t$  vs.  $t$  Curves



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# SF-3812FG-T Series – Fast Acting & Low Voltage SMD Fuses

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## Typical Part Marking

Represents total content. Layout may vary.



| Rated Current | Part Marking |
|---------------|--------------|
| 20 A          | H 20 A       |
| 25 A          | H 25 A       |
| 30 A          | H 30 A       |

## How to Order

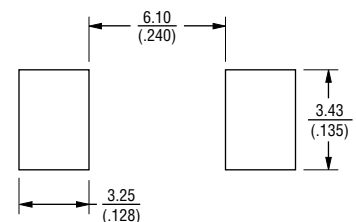
**SF - 3812 FG 2000 T - 2**

SinglFuse™ \_\_\_\_\_  
 Product Designator \_\_\_\_\_  
 SMD Footprint \_\_\_\_\_  
 3812 = EIA 3812  
 (10030 metric)  
 Fuse Blow Type \_\_\_\_\_  
 FG = Fast Acting & Low Voltage  
 Rated Current \_\_\_\_\_  
 2000 ~ 3000 (20 A ~ 30 A)  
 Structure Type \_\_\_\_\_  
 T = Ceramic Tube  
 Packaging Type \_\_\_\_\_  
 - 2 = Tape & Reel

## Packaging

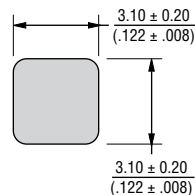
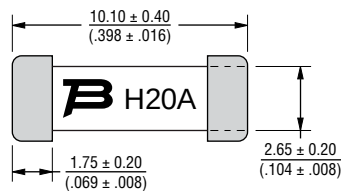
|                |                       |
|----------------|-----------------------|
| Reel Dimension | 13-inch Tape and Reel |
| Specification  | EIA 481-2             |
| Quantity       | 2,500 pieces          |
| Packaging Code | -2                    |

## Recommended Pad Layout



DIMENSIONS:  $\frac{\text{MM}}{(\text{INCHES})}$

## Product Dimensions



DIMENSIONS:  $\frac{\text{MM}}{(\text{INCHES})}$

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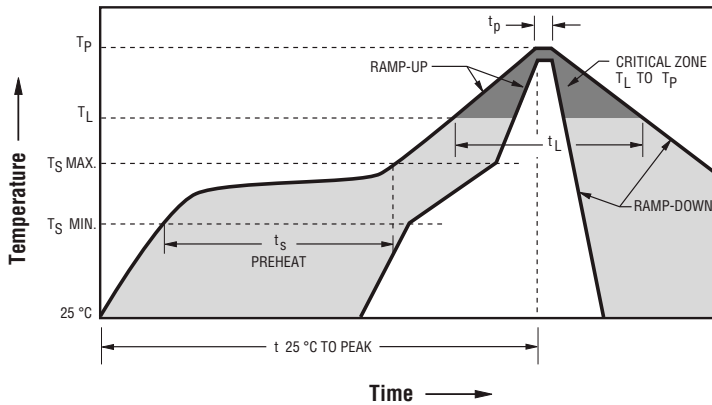
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## SF-3812FG-T Series – Fast Acting & Low Voltage SMD Fuses

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### Solder Reflow Recommendations

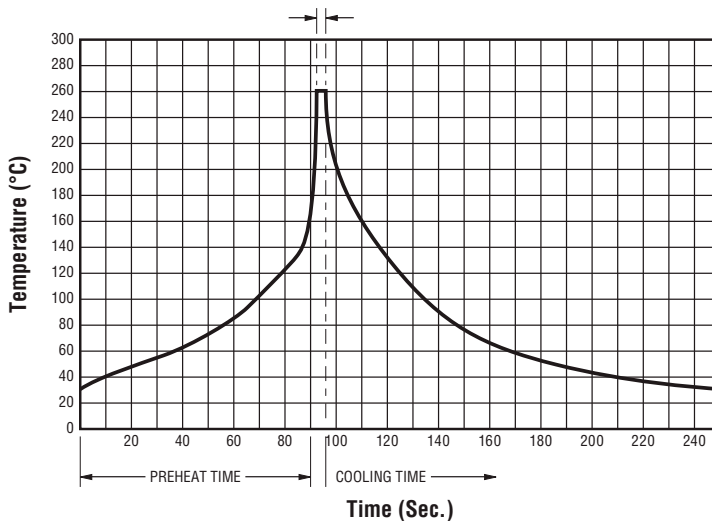


| Profile Feature                                                                                                                                                       | Pb-Free Assembly                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| Preheat / Soak:<br>Temperature Min. ( $T_{S\text{min}}$ )<br>Temperature Max. ( $T_{S\text{max}}$ )<br>Time ( $t_s$ ) from ( $T_{S\text{min}}$ to $T_{S\text{max}}$ ) | 150 °C<br>200 °C<br>60~180 seconds |
| Ramp Up Rate ( $T_L$ to $T_p$ )                                                                                                                                       | 3 °C / second max.                 |
| Ramp Up Rate ( $T_{S\text{max}}$ to $T_L$ )                                                                                                                           | 5 °C / second max.                 |
| Liquidous Temperature ( $T_L$ )<br>Time ( $t_L$ ) maintained above $T_L$                                                                                              | 217 °C<br>60~150 seconds           |
| Peak Package Body Temperature ( $T_p$ )                                                                                                                               | 260 °C +0/-5 °C                    |
| Time within 5 °C of actual peak temperature ( $T_p$ )                                                                                                                 | 10~30 seconds*                     |
| Ramp Down Rate ( $T_p$ to $T_L$ )                                                                                                                                     | 6 °C / second max.                 |
| Time 25 °C to Peak Temperature                                                                                                                                        | 8 minutes max.                     |
| Do not exceed                                                                                                                                                         | 260 °C                             |

\* Tolerance for peak profile temperature ( $T_p$ ) is defined as a supplier minimum and a user maximum.

### Solder Wave Recommendations

#### Peak Temperature (Dwell Time)



| Profile Feature                                                           | Pb-Free Assembly        |
|---------------------------------------------------------------------------|-------------------------|
| Preheat:<br>Temperature Max. ( $T_{S\text{max}}$ )<br>Time (Min. to Max.) | 150 °C<br>60~90 seconds |
| Solder Pot Temperature                                                    | 260 °C max.             |
| Solder Dwell Time                                                         | 2~3 seconds             |

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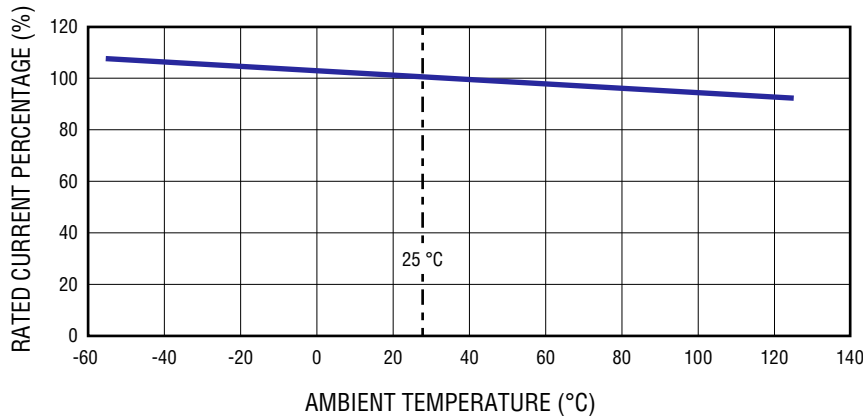
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## SF-3812FG-T Series – Fast Acting & Low Voltage SMD Fuses

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Current Rating Thermal Derating Curve



Reliability Testing

| No. | Test                         | Test Condition                                                                                                                                         | Requirement                                                          | Test Reference                                  |
|-----|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------|-------------------------------------------------|
| 1   | Solderability                | Temperature setup: 235 ±5 °C<br>Time setup: 10 ±1 sec.                                                                                                 | After test terminal electrode wetting area must be greater than 95 % | IEC 60068-2-58                                  |
| 2   | Resistance to soldering heat | Temperature setup: 235 ±5 °C<br>Time setup: 30 ±5 sec.                                                                                                 | DCR change ≤ ±15 %                                                   | IEC 60068-2-58                                  |
| 3   | Thermal shock                | Temperature setup:<br>25 °C ~ -65 °C ~ 25 °C ~ 125 °C<br>Time setup: -65 °C (30 min)<br>~ 25 °C (5 min) ~ 125 °C (30 min)<br>~ 25 °C (5 min), 5 cycles | DCR change ≤ ±15 %<br>No mechanical damage                           | MIL-STD-202G<br>Method 107G<br>Test Condition B |
| 4   | Humidity unload              | Heat (85 ±0.5 °C)<br>High Humidity (85 ±1 % RH)<br>240 hours                                                                                           | DCR change ≤ ±15 %<br>No mechanical damage                           | MIL-STD-202G<br>Method 103B<br>Test Condition A |
| 5   | Salt spray                   | Salt spray concentration: 5 ±1 %<br>Test liquid temperature: 35 ±0.5 °C<br>96 hours                                                                    | DCR change ≤ ±15 %<br>No mechanical damage                           | MIL-STD-202G<br>Method 101E<br>Test Condition A |
| 6   | Bending                      | The board shall be bent by 1 mm at a rate of 1 mm/sec.                                                                                                 | DCR change ≤ ±15 %                                                   | IEC 60127-4                                     |
| 7   | Vibration                    | Frequency setup: 10 ~ 55 ~ 10 Hz<br>Time setup: 1 Minute/cycle<br>(X-Y-Z, 120 cycles, 6 hours)                                                         | DCR change ≤ ±15 %<br>No mechanical damage                           | MIL-STD-202G<br>Method 201A                     |

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