



## SinglFuse™ SF-2410FP-T Series Features

- Single blow fuse for overcurrent protection
- EIA 2410 (6125 metric) footprint
- Ceramic tube design for fast acting precision fusing speed applications
- UL 248-14 compliant
- Surface mount packaging for automated assembly
- RoHS compliant\* and halogen free\*\*

## SF-2410FP-T Series – Fast Acting Precision SMD Fuses

### Clearing Time Characteristics for Series

| % of Current Rating | Clearing Time at 25 °C |           |
|---------------------|------------------------|-----------|
|                     | Min.                   | Max.      |
| 100 %               | 4 hours                | —         |
| 200 %               | —                      | 5 seconds |

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### Electrical Characteristics

| Model            | Rated Current (A) | Resistance (Ω) Typ.*** | Rated Voltage | Interrupting Rating                                | Typical I <sup>2</sup> t (A <sup>2</sup> s) **** | Certifications               |
|------------------|-------------------|------------------------|---------------|----------------------------------------------------|--------------------------------------------------|------------------------------|
|                  |                   |                        |               |                                                    |                                                  | cUL: <a href="#">E198545</a> |
| SF-2410FP0062T-2 | 0.062             | 6.653                  | 125 VDC       | 50 A @ 125 VAC<br>50 A @ 125 VDC<br>300 A @ 32 VDC | 0.0012                                           | ✓                            |
| SF-2410FP008T-2  | 0.080             | 4.974                  |               |                                                    | 0.0017                                           | ✓                            |
| SF-2410FP010T-2  | 0.100             | 3.014                  |               |                                                    | 0.0043                                           | ✓                            |
| SF-2410FP0125T-2 | 0.125             | 2.044                  |               |                                                    | 0.0094                                           | ✓                            |
| SF-2410FP016T-2  | 0.160             | 0.8655                 |               |                                                    | 0.0116                                           | ✓                            |
| SF-2410FP020T-2  | 0.200             | 1.8535                 |               |                                                    | 0.0517                                           | ✓                            |
| SF-2410FP025T-2  | 0.250             | 1.119                  |               |                                                    | 0.0528                                           | ✓                            |
| SF-2410FP0315T-2 | 0.315             | 0.843                  |               |                                                    | 0.1365                                           | ✓                            |
| SF-2410FP0375T-2 | 0.375             | 0.732                  |               |                                                    | 0.1502                                           | ✓                            |
| SF-2410FP040T-2  | 0.400             | 0.4995                 |               |                                                    | 0.2149                                           | ✓                            |
| SF-2410FP050T-2  | 0.500             | 0.476                  |               |                                                    | 0.358                                            | ✓                            |
| SF-2410FP075T-2  | 0.750             | 0.2065                 |               |                                                    | 0.3761                                           | ✓                            |
| SF-2410FP100T-2  | 1.00              | 0.158                  |               |                                                    | 0.4143                                           | ✓                            |
| SF-2410FP150T-2  | 1.50              | 0.114                  |               |                                                    | 1.0606                                           | ✓                            |
| SF-2410FP200T-2  | 2.00              | 0.0605                 |               |                                                    | 1.08                                             | ✓                            |
| SF-2410FP250T-2  | 2.50              | 0.044                  |               |                                                    | 1.1471                                           | ✓                            |
| SF-2410FP300T-2  | 3.00              | 0.036                  |               |                                                    | 1.548                                            | ✓                            |
| SF-2410FP315T-2  | 3.15              | 0.033                  |               |                                                    | 2.6485                                           | ✓                            |
| SF-2410FP350T-2  | 3.50              | 0.029                  |               |                                                    | 2.695                                            | ✓                            |
| SF-2410FP400T-2  | 4.00              | 0.021                  |               |                                                    | 3.9744                                           | ✓                            |
| SF-2410FP500T-2  | 5.00              | 0.013                  |               |                                                    | 6.175                                            | ✓                            |
| SF-2410FP700T-2  | 7.00              | 0.01                   |               |                                                    | 9.016                                            | ✓                            |
| SF-2410FP800T-2  | 8.00              | 0.0085                 |               |                                                    | 16.758                                           | ✓                            |
| SF-2410FP1000T-2 | 10.00             | 0.006                  |               |                                                    | 24.42                                            | ✓                            |

\*\*\* 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.

\*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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## SinglFuse™ SF-2410FP-T Series Applications

- Notebooks
- LCD Monitors
- LCD Backlight Inverters
- POE, POE+
- PC Servers
- Power Supplies
- Game Consoles
- White Goods

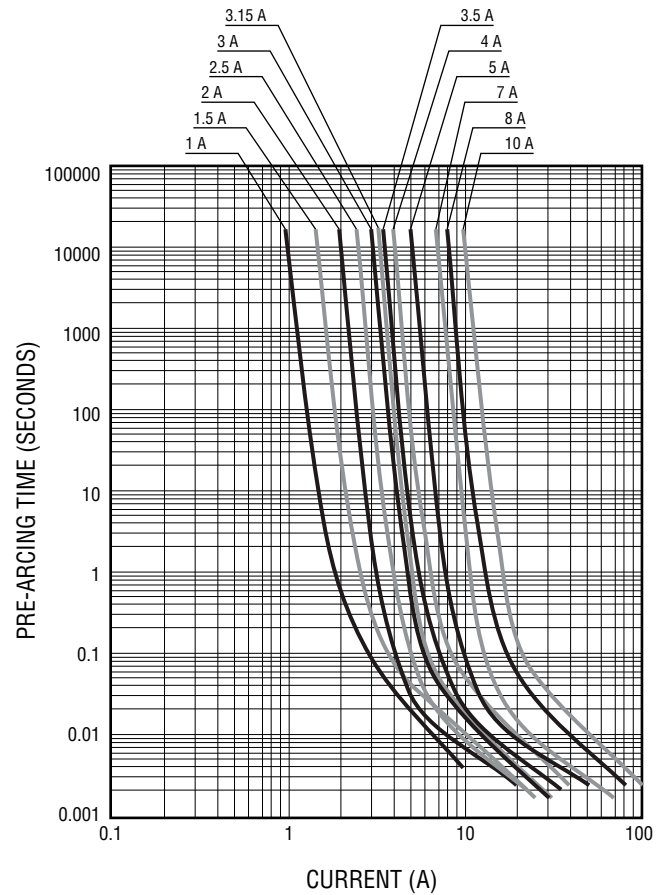
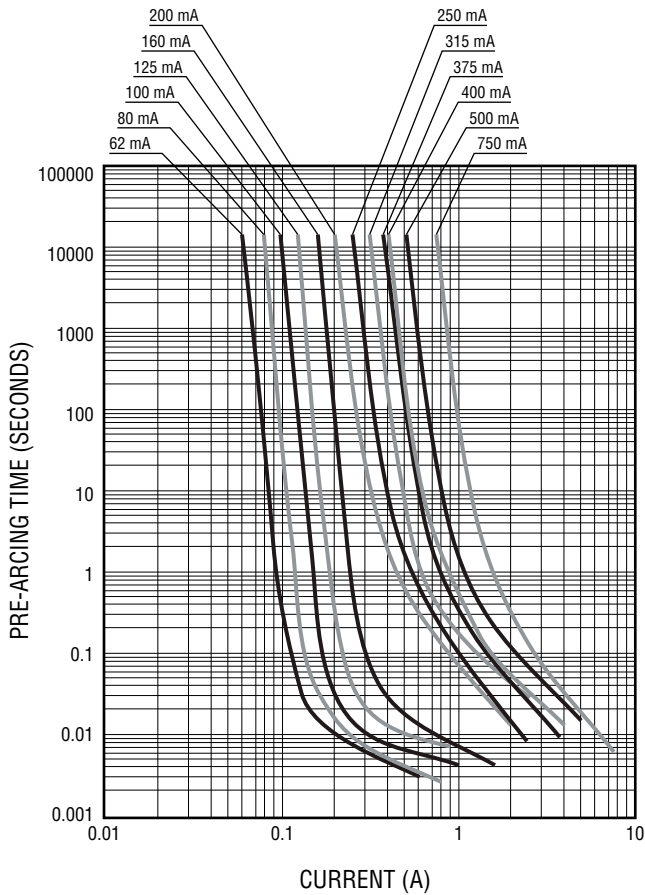
## SF-2410FP-T Series – Fast Acting Precision SMD Fuses

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### 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                         |

### Average Pre-Arcing Time vs. Current Curves



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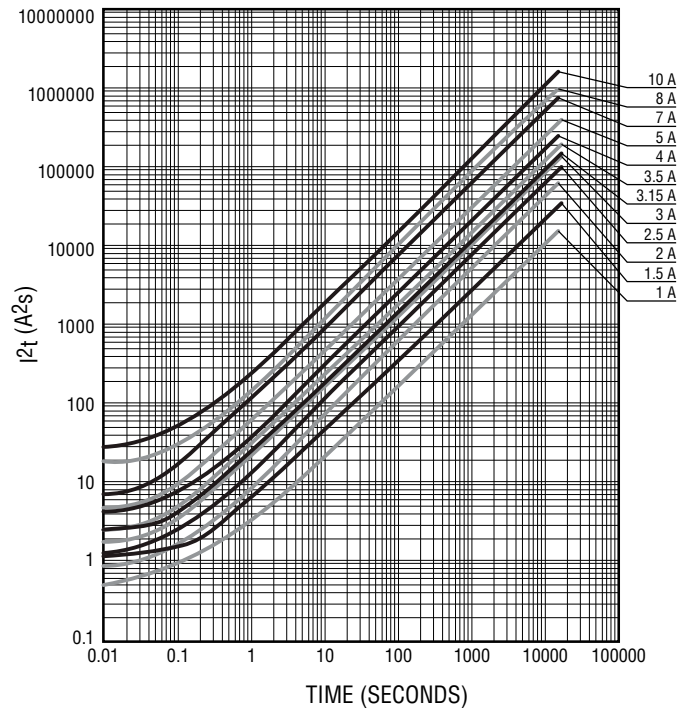
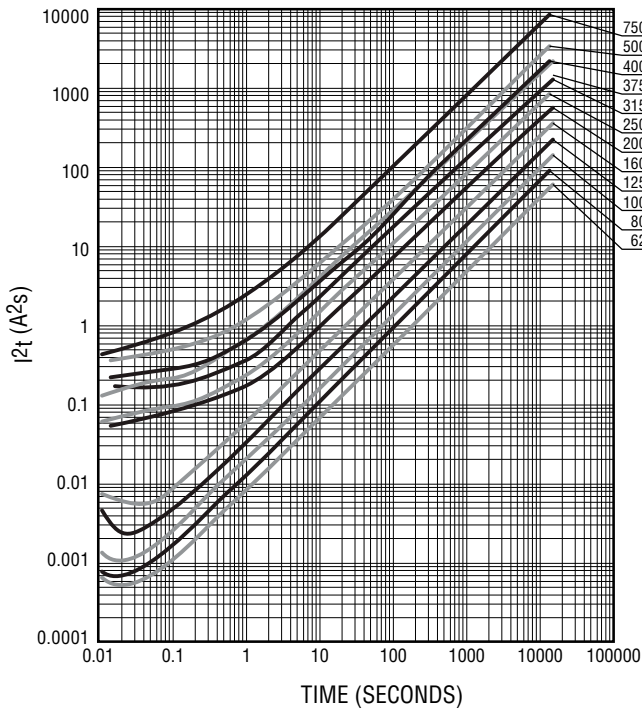
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# SF-2410FP-T Series – Fast Acting Precision SMD Fuses

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



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# SF-2410FP-T Series – Fast Acting Precision SMD Fuses

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## How to Order

**SF - 2410 FP 0062 T - 2**

SinglFuse™

Product Designator

SMD Footprint

2410 = EIA 2410 (6125 metric)

Fuse Blow Type

FP = Fast Acting Precision

Rated Current

0062 ~ 1000 (62 mA ~ 10 A)

Structure Type

T = Ceramic Tube

Packaging Type

- 2 = Tape & Reel

## Packaging

|                |                      |
|----------------|----------------------|
| Reel Dimension | 7-inch Tape and Reel |
| Specification  | EIA 481-2            |
| Quantity       | 1,000 pieces         |
| Packaging Code | -2                   |

## Typical Part Marking

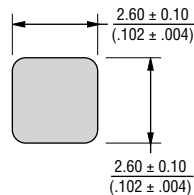
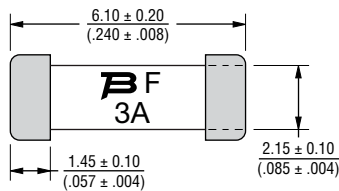
Represents total content. Layout may vary.



| Rated Current | Part Marking |
|---------------|--------------|
| 62 mA         | 62 mA        |
| 80 mA         | 80 mA        |
| 100 mA        | 100 mA       |
| 125 mA        | 125 mA       |
| 160 mA        | 160 mA       |
| 200 mA        | 200 mA       |
| 250 mA        | 250 mA       |
| 315 mA        | 315 mA       |
| 375 mA        | 375 mA       |
| 400 mA        | 400 mA       |
| 500 mA        | 500 mA       |
| 750 mA        | 750 mA       |

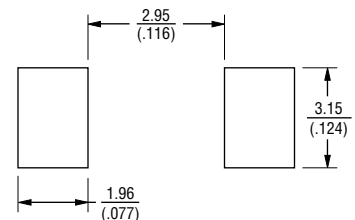
| Rated Current | Part Marking |
|---------------|--------------|
| 1 A           | 1 A          |
| 1.5 A         | 1.5 A        |
| 2 A           | 2 A          |
| 2.5 A         | 2.5 A        |
| 3 A           | 3 A          |
| 3.15 A        | 3.15 A       |
| 3.5 A         | 3.5 A        |
| 4 A           | 4 A          |
| 5 A           | 5 A          |
| 7 A           | 7 A          |
| 8 A           | 8 A          |
| 10 A          | 10 A         |

## Product Dimensions



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

## Recommended Pad Layout



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

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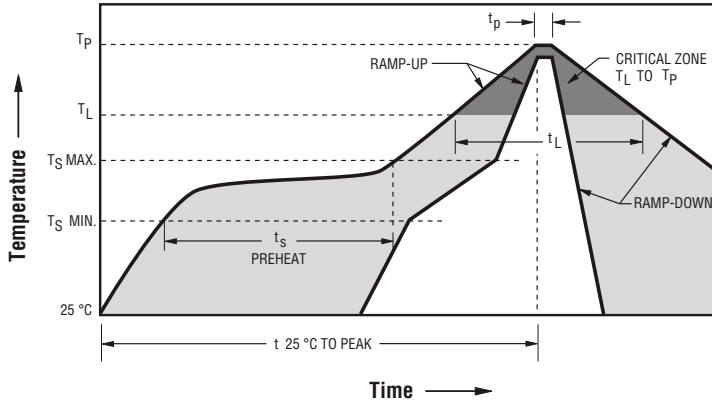
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# SF-2410FP-T Series – Fast Acting Precision SMD Fuses

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## Solder Reflow Recommendations

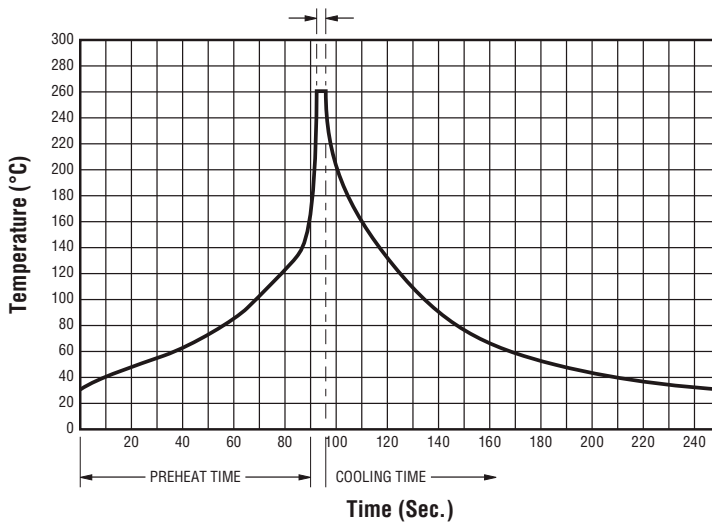


| Profile Feature                                                                                                                                                            | Pb-Free Assembly                                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Preheat / Soak:<br>Temperature Min. (T <sub>smin</sub> )<br>Temperature Max. (T <sub>smax</sub> )<br>Time (t <sub>s</sub> ) from (T <sub>smin</sub> to T <sub>smax</sub> ) | 150 °C<br>200 °C<br>60~180 seconds                                         |
| Ramp Up Rate (T <sub>L</sub> to T <sub>p</sub> )                                                                                                                           | 3 °C / second max.                                                         |
| Ramp Up Rate (T <sub>smax</sub> to T <sub>L</sub> )                                                                                                                        | 5 °C / second max.                                                         |
| Liquidous Temperature (T <sub>L</sub> )<br>Time (t <sub>L</sub> ) maintained above T <sub>L</sub>                                                                          | 217 °C<br>60~150 seconds                                                   |
| Peak Package Body Temperature (T <sub>p</sub> )                                                                                                                            | 235 °C ± 5 °C<br>(for <1 A rating)<br>260 °C +0/-5 °C<br>(for ≥1 A rating) |
| Time within 5 °C of actual peak temperature (T <sub>p</sub> )                                                                                                              | 20~30 seconds*                                                             |
| Ramp Down Rate (T <sub>p</sub> to T <sub>L</sub> )                                                                                                                         | 6 °C / second max.                                                         |
| Time 25 °C to Peak Temperature                                                                                                                                             | 8 minutes max.                                                             |

\* Tolerance for peak profile temperature (T<sub>p</sub>) 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 <sub>smax</sub> )<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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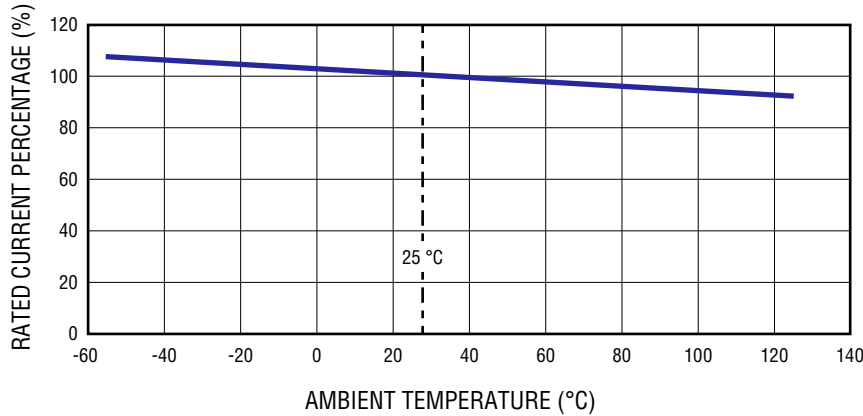
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## SF-2410FP-T Series – Fast Acting Precision SMD Fuses

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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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