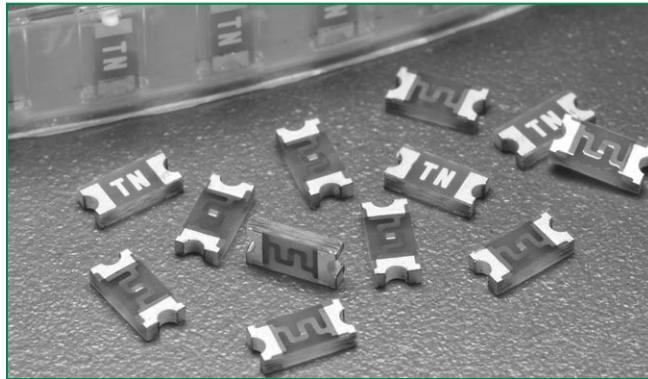# Littelfuse®

RoHS Pb **468 Series Fuse**

Description

The 468 series time-lag (Slo-Blo) surface mount fuse series is a small (1206 size) thin-film device designed for secondary protection of circuits used in space constrained applications such as hand-held portable electronic devices.

This series is 100% lead-free and meet the requirements of the RoHS directive. New Halide Free 468 series fuses are available, orderable using the "HF" suffix. See Part Numbering section for additional information.

Features

- Complies with electronic industry environmental standards for lead reduction.
- Product is compatible with lead-free solders and higher temperature profiles.
- Time delay feature withstands high in-rush currents and prevents nuisance openings.
- Package is visually distinct from fast-acting version for easy identification.
- Top side marking allows visual verification of amperage rating.

Applications

Secondary protection for space constrained applications:

- Cell phones
- Battery packs
- Digital cameras
- DVD players
- Hard disk drives.

Agency Approvals

Agency	Agency File Number	Ampere Range
®UL	E10480	500mA - 3A
CSA	LR29862	500mA - 3A

Electrical Characteristics for Series

% of Ampere Rating	Opening Time at 25°C
100%	4 hours, Minimum
200%	1 sec., Min.; 120 sec., Max.
300%	0.05 sec., Min.; 1.5 sec., Max
800%	0.0015 sec., Min.; .05 sec., Max.

Electrical Specifications by Item

| Ampere Rating (A)	Amp Code	Max Voltage Rating (V)	Interrupting Rating	Nominal Cold Resistance (Ohms)	Nominal Melting I²t (A²sec)	Nom Voltage Drop (mV)	Nom Power Dissipation (W)	Agency Approvals ®UL	Agency Approvals CSA
0.50	.500	63	50 amperes @63 VAC/VDC	0.27000	0.0310	156.77	0.0784	x	x
1.00	001.	63	50 amperes @63 VAC/VDC	0.08250	0.1270	94.70	0.0947	x	x
1.50	01.5	63	50 amperes @63 VAC/VDC	0.04750	0.2880	82.32	0.1235	x	x
2.00	002.	63	35 amperes @63 VAC 50 amperes @63 VDC	0.03240	0.5060	77.27	0.1545	x	x
2.50	02.5	63	35 amperes @63 VAC 50 amperes @63 VDC	0.02240	1.0110	73.92	0.1848	x	x
3.00	003.	32	50 amperes @32 VAC/VDC	0.01950	1.2700	72.95	0.2189	x	x

1. Measured at 10% of rated current, 25ºC.
2. Measured at rated voltage.

Temperature Rerating Curve
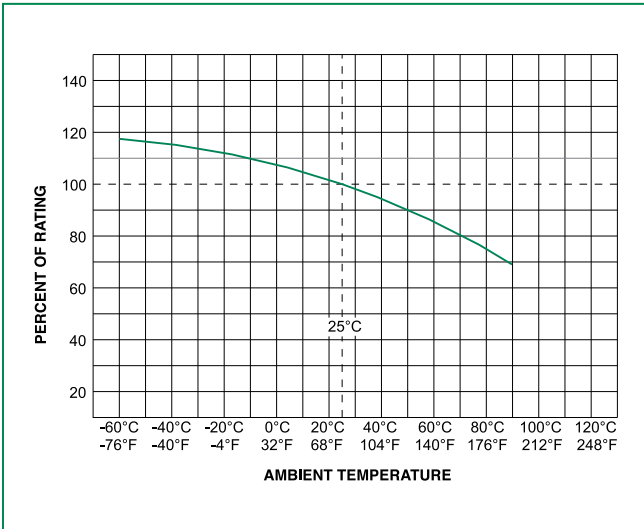
Average Time Current Curves
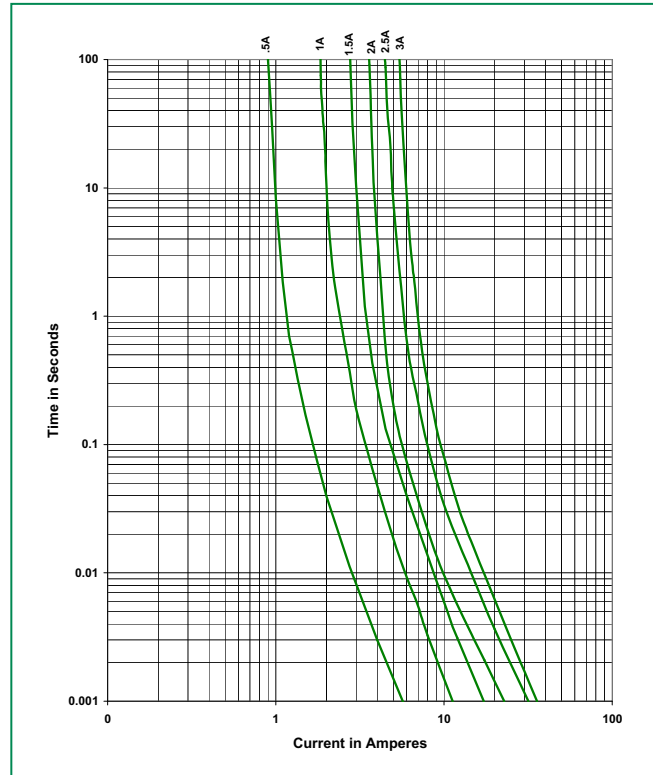
Soldering Parameters - Wave Soldering

| Reflow Condition		Pb – Free assembly
Pre Heat	- Temperature Min ($T_{s(min)}$)	150°C
	- Temperature Max ($T_{s(max)}$)	200°C
	- Time (Min to Max) (t_s)	60 – 180 secs
Average ramp up rate (Liquidus Temp (T_L) to peak		5°C/second max
$T_{S(max)}$ to T_L - Ramp-up Rate		5°C/second max
Reflow	- Temperature (T_L) (Liquidus)	217°C
	- Temperature (t_L)	60 – 150 seconds
Peak Temperature (T_P)		250$^{+0/-5}$ °C
Time within 5°C of actual peak Temperature (t_p)		20 – 40 seconds
Ramp-down Rate		5°C/second max
Time 25°C to peak Temperature (T_P)		8 minutes Max.
Do not exceed		260°C
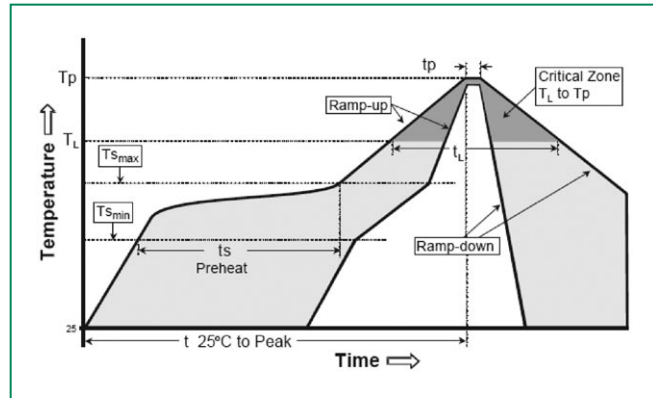
Product Characteristics

Materials	**Body:** Epoxy Substrate **Terminations:** 100% Tin **Element Cover Coat:** Conformal Coating
Operating Temperature	–55°C to 90°C. Consult temperature rerating curve chart. For operation above 90°C please contact Littelfuse
Thermal Shock	Withstands 5 cycles of – 50°C to 125°C
Humidity	MIL-STD-202F Method 103B Condition D

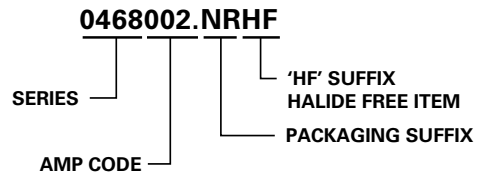| Vibration	Withstands 10-55 Hz per MIL-STD-202F, Method 201A and 10-2000 Hz at 20 G's per MIL-STD-202F, Method 204D, Condition D
Insulation Resistance (After Opening)	Greater than 10,000 ohms.
Resistance to Soldering Heat	Withstands 60 seconds above 200°C and up to 260°C, maximum

Dimensions
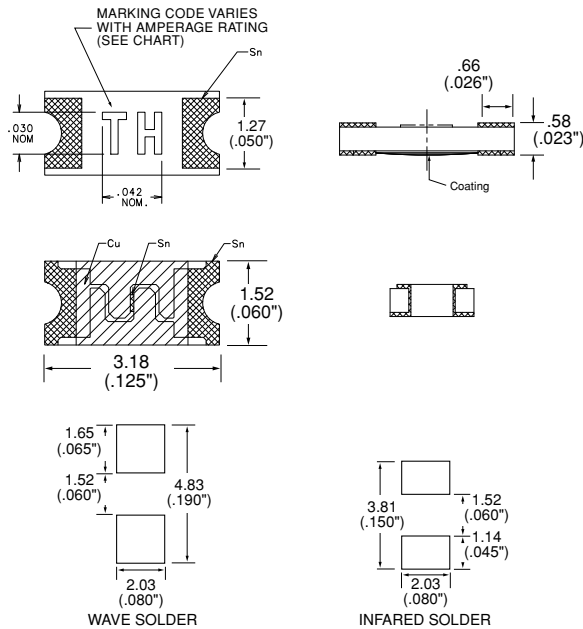
Part Marking System

Amp Code	Marking Code
.500	**TF**
001.	**TH**
01.5	**TK**
002.	**TN**
02.5	**TO**
003.	**TP**

Part Numbering System

0468002.NRHF

- SERIES
- AMP CODE
- PACKAGING SUFFIX
- **'HF' SUFFIX HALIDE FREE ITEM**

The dot is positioned before the Packaging Suffix with whole ratings and within the numbering sequence for fractional ratings.

Refer to Amp Code column in the Electrical Specifications table.

Example: 1.5 amp product is 046801.5NRHF (2 amp product shown above)

Packaging

Packaging Option	Packaging Specification	Quantity	Quantity & Packaging Code
Tape & Reel – 8mm tape	EIA RS-481-1 (IEC 286, part 3)	5000	NR