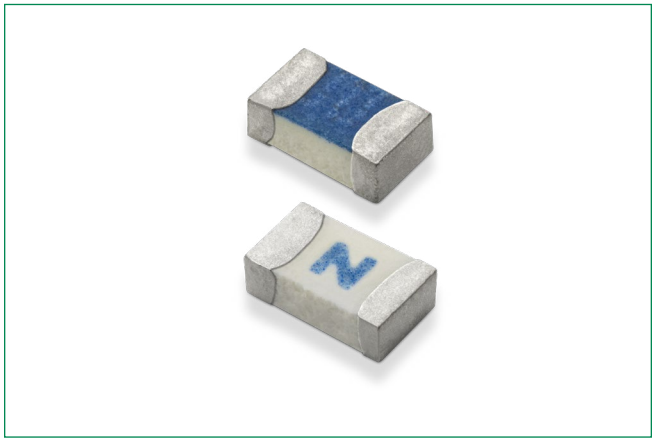
408 Series

0603 Time-Lag > Ceramic Fuse



Web Resources

Download ECAD models, order samples, and find technical recources at www.littelfuse.com

Agency Approvals

Agency	Agency File Number	Ampere Range
c UL us	E10480	1–7 A

Electrical Characteristics

% of Ampere Rating	Opening Time at 25 °C
100%	4 hours Minimum
200%	120 secs Max
300%	3 secs Max
800%	0.05 secs Max

Description

Littelfuse 408 Series is a 100% lead-free, RoHS compliant, and halogen-free fuse designed specifically to provide overcurrent protection to circuits that operate under high working ambient temperatures up to 150 °C and high in-rush currents. The general design ensures excellent temperature stability and performance reliability. This high I^2t time lag fuse is designed to have ultra-high in-rush current withstand capability to avoid nuisance fuse open.

Features

- Operating Temperature from -55 °C to +150 °C
- UL Recognized to UL / CSA / NMX 248-1 and UL / CSA / NMX 248-14
- 100% Lead-free, RoHS compliant, and Halogen-free
- Suitable for both leaded and lead-free reflow / wave soldering
- Ultra-high I^2t values

Benefits

- Avoids nuisance opening due to high inrush and surge current inherent in the system
- High current ratings in small size

Application

- Displays
- Servers
- Computers
- Printers
- Scanners
- Data Modems
- Gaming Consoles

Electrical Specifications

Ampere Rating (A)	Amp Code	Max. Voltage Rating (V)	Interrupting Rating (AC/DC)[1]	Nominal Resistance (Ohms)[2]	Nominal Melting I^2t (A2Sec.)[3]	Nominal Voltage Drop at Rated Current (V)[4]	Nominal Power Dissipation at Rated Current (W)	Agency Approval c UL us
1.00	001.	32	50A@32VDC	0.260	0.09	0.400	0.400	X
1.50	01.5	32		0.116	0.18	0.220	0.330	X
2.00	002.	32		0.065	0.55	0.190	0.380	X
2.50	02.5	32		0.052	0.65	0.180	0.450	X
3.00	003.	32		0.030	0.87	0.135	0.405	X
3.50	03.5	32		0.027	1.25	0.130	0.455	X
4.00	004.	32		0.018	2.40	0.120	0.480	X
5.00	005.	32		0.013	3.40	0.115	0.575	X
7.00	007.	32		0.0105	4.80	0.112	0.784	X

Notes:

1. Nominal Resistance measured with < 10% rated current.
2. Nominal Melting I^2t measured at 1 msec opening time.
3. Nominal Voltage Drop measured at rated current after temperature has stabilized.

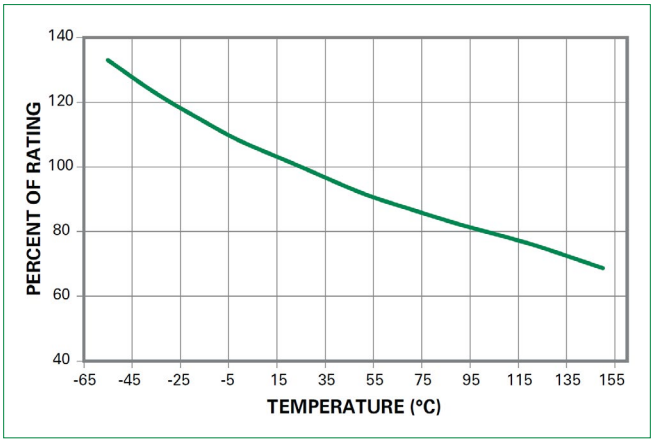
- Devices designed to carry rated current for 4 hours minimum. It is recommended that devices be operated continuously at no more than 80% rated current. See Temperature Re-rating Curve for additional derating information.
- Devices designed to be mounted with marking code facing up.

Revised: GD. 02/21/24

408 Series

0603 Time-Lag > Ceramic Fuse

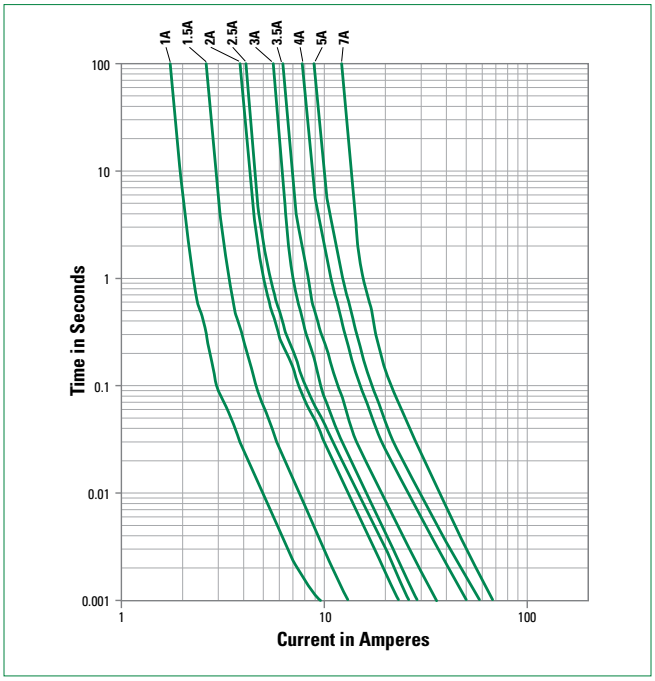
Temperature Re-rating Curve



Note:
Re-rating depicted in this curve is in addition to the standard re-rating of 20% for continuous operation.

Example:
For continuous operation at 75 °C, the fuse should be rerated as follows: I = (0.80) (0.85) I_{RAT} = (0.68) I_{RAT}

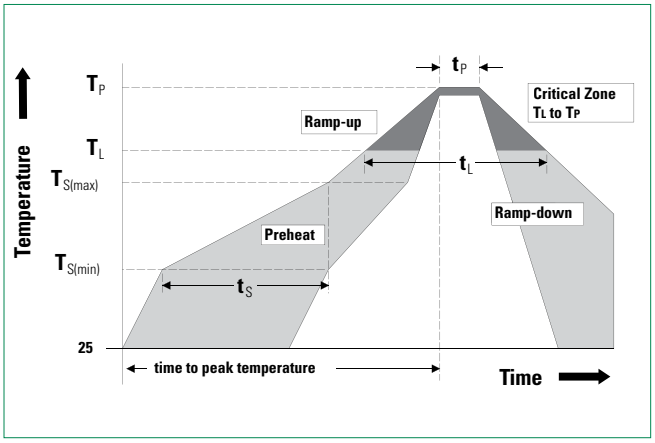
Average Time Current Curves



Soldering Parameters–Reflow 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		3 °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 secs
Peak Temperature (T_p)		260+0 / –5 °C
Time within 5 °C of actual peak Temperature (t_p)		10–30 seconds
Ramp-down Rate		6 °C / second max.
Time 25 °C to peak Temperature (T_p)		8 minutes max.
Do not exceed		260 °C

Wave soldering	260 °C, 10 seconds max.



Revised: GD. 02/21/24

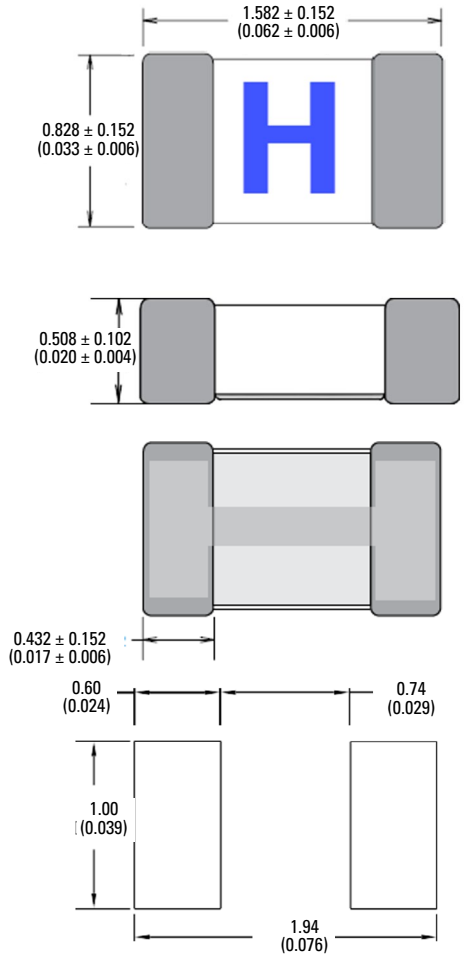
408 Series
0603 Time-Lag > Ceramic Fuse

Product Characteristics

Materials	**Body:** Advanced Ceramic **Terminations:** Ag / Ni / Sn (100% Lead-free) **Element Cover Coating:** Lead-free Glass
Moisture Sensitivity Level	IPC / JEDEC J-STD-020, Level 1
Solderability	IPC / EIC / JEDEC J-STD-002, Condition B
Humidity	MIL-STD-202, Method 103, Conditions D
Resistance to Solder Heat	MIL-STD-202, Method 210, Condition B
Moisture Resistance	MIL-STD-202, Method 106
Thermal Shock	MIL-STD-202, Method 107, Condition B-3
Mechanical Shock	MIL-STD-202, Method 213, Condition A
Vibration	MIL-STD-202, Method 201
Vibration, High Frequency	MIL-STD-202, Method 204, Condition D
Dissolution of Metallization	IPC / EIC / JEDEC J-STD-002, Condition D
Terminal Strength	IEC 60127-4

Dimensions

All dimensions in mm (inch)



Part Marking System

Amp Code	Marking Code
001.	**H**
01.5	**K**
002.	**N**
02.5	**O**
003.	**P**
03.5	**R**
004.	**S**
005.	**T**
007.	**V**

Part Numbering System

0408 001. W R

Series

Amp Code
Refer to Amp Code column of Electrical Characteristics Table

Packaging Code
R = Reel pack

Quantity Code
W=3000 pieces

Packaging

Packaging Option	Form Factor	Packaging Specification	Quantity	Quantity & Packaging Code
8mm Tape and Reel	Surface Mount	EIA-481, IEC 60286-3	3000	WR

Revised: GD. 02/21/24