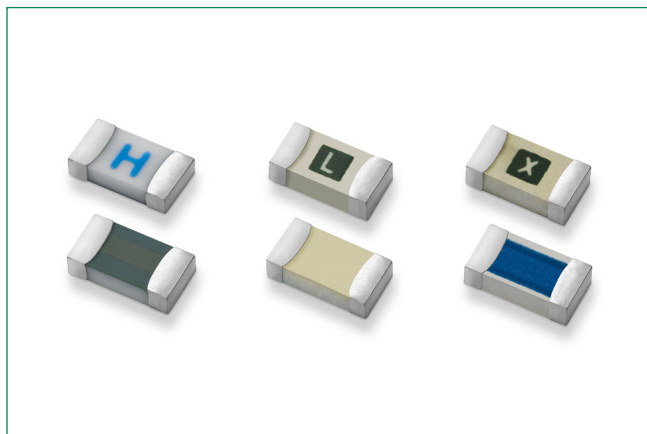


440 Series

1206 High I²t Fuse



Additional Information



Resources



Accessories



Samples

Description

The 440 Series is a 100% RoHS Compliant, lead-free and halogen-free fuse series designed specifically to provide over-current protection to circuits that operate under high working ambient temperatures up to 150°C and high inrush currents. The general design ensures excellent temperature stability and performance reliability. This high I²t fuse series is designed to have ultra high inrush current withstand capability to avoid nuisance fuse open.

Features and Benefits

- Operating Temperature from -55°C to +150°C
- Ultra high I²t values
- RoHS compliant, lead-free and halogen-free
- Recognized to UL/CSA/NMX 248-1 and UL/CSA/NMX 248-14
- Suitable for both leaded and lead-free reflow / wave soldering

Applications

- LCD Displays
- Servers
- Notebook Computers
- Printers
- Scanners
- Data Modems
- Hard Disk Drives

Electrical Characteristics for Series

% of Ampere Rating	Ampere Rating	Opening Time at 25°C
100%	0.25A - 8A	4 hours, Minimum
350%	0.25A - 8A	5 secs., Maximum

Agency Approvals

Agency	Agency File Number	Ampere Range
cUL US	E10480	0.25A - 8A
CSA	29862	0.25A - 8A

Electrical Specifications by Item

Ampere Rating (A)	Amp Code	Max. Voltage Rating (V)	Interrupting Rating (AC/DC)	Nominal Resistance (Ohms) ¹	Nominal Melting I ² t (A ² Sec.) ²	Nominal Voltage Drop At Rated Current (V) ³	Nominal Power Dissipation At Rated Current (W)	Agency Approvals	
								cUL US	CSA
0.250	.250	125	50 A @ 125 V AC/DC	2.140	0.00649	0.5260	0.132	X	X
0.375	.375	125		1.216	0.01455	0.4993	0.187	X	X
0.500	.500	63		0.8140	0.02642	0.4831	0.242	X	X
0.750	.750	63	50 A @ 63 V AC/DC	0.4624	0.09312	0.3983	0.299	X	X
1.00	001.	50	50 A @ 50 VAC/DC	0.3096	0.21054	0.3457	0.346	X	X
1.25	1.25	50		0.2265	0.379	0.3240	0.405	X	X
1.50	01.5	50		0.1759	0.50652	0.3215	0.482	X	X
1.75	1.75	32		0.0450	0.4000	0.0777	0.136	X	X
2.00	002.	32	50 A @ 32 V AC/DC	0.0385	0.4700	0.0792	0.158	X	X
2.50	02.5	32		0.02850	0.8200	0.0747	0.187	X	X
3.00	003.	32		0.02252	1.2470	0.0742	0.223	X	X
3.50	03.5	32		0.01845	2.3800	0.0757	0.265	X	X
4.00	004.	32		0.01553	3.136	0.0709	0.284	X	X
5.00	005.	32		0.0120	5.949	0.0654	0.327	X	X
7.00	007.	32		0.00753	10.38	0.0696	0.487	X	X
8.00	008.	32		0.00634	13.03	0.0655	0.524	X	X

Notes:

1. Nominal Resistance measured with < 10% rated current.
2. Contact Littelfuse if application transient surges are less than 1 ms.
3. Nominal Voltage Drop measured at rated current after temperature has stabilized.

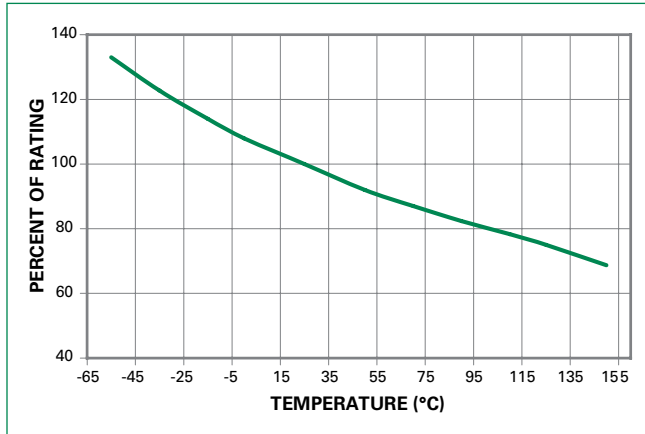
Devices designed to carry rated current for 4 hours minimum. It is recommended that devices be operated continuously at no more than 80% rated current. See "Temperature Derating Curve" for additional derating information.

Devices designed to be mounted with marking code facing up.

440 Series

1206 High I²t Fuse

Temperature Derating Curve



Note:

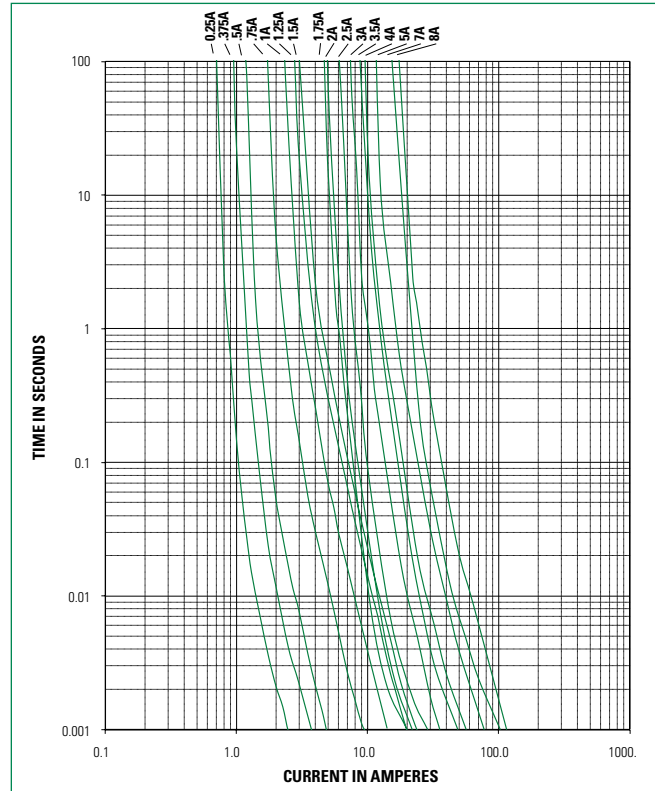
- Derating depicted in this curve is in addition to the standard derating of 20% for continuous operation.

Example:

For continuous operation at 75 degrees celsius, the fuse should be derated as follows:

$$I = (0.80)(0.85)I_n = (0.68)I_n$$

Average Time Current Curves

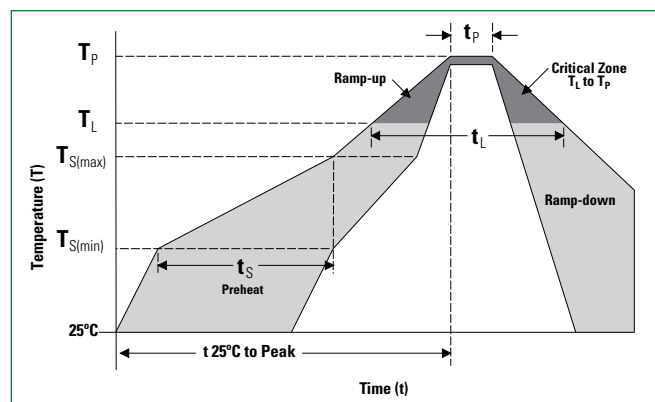


Soldering Parameters

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 seconds
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 seconds
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.



440 Series

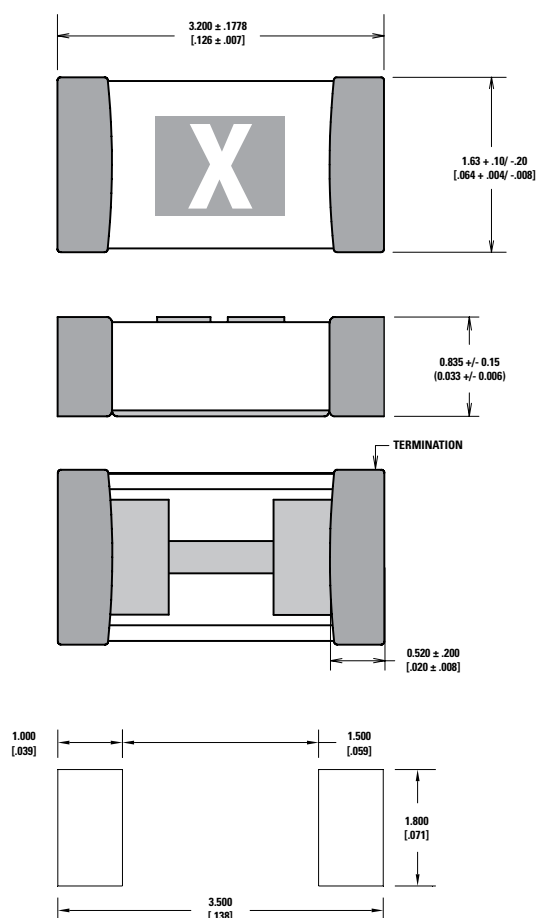
1206 High I²t Fuse

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/ECA/JEDEC J-STD-002, Condition C
Humidity Test	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
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/ECA/JEDEC J-STD-002, Condition D
Terminal Strength	IEC 60127-4

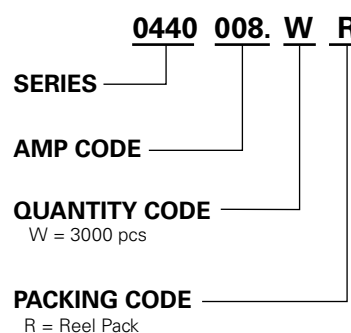
Dimensions mm (inches)



Part Marking System

Amp Code	Marking Code	Amp Code	Marking Code
.250	D	002.	N
.375	E	02.5	O
.500	F	003.	P
.750	G	03.5	R
001.	H	004.	S
1.25	J	005.	T
01.5	K	007.	W
1.75	L	008.	X

Part Numbering System



Packaging

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

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