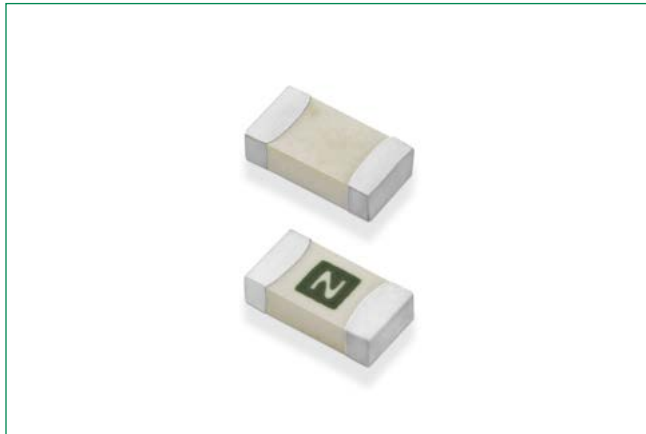


# 440 Series

## 1206 High I<sup>2</sup>t Fuse



### 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 I<sup>2</sup>t 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 I<sup>2</sup>t 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

### Web Resources



Download ECAD models, order samples, and find technical resources at [www.littelfuse.com](http://www.littelfuse.com)

### 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
cULUS	E10480	0.25A - 8A
SP	29862	0.25A - 8A

### Electrical Specifications by Item

Ampere Rating (A)	Amp Code	Max. Voltage Rating (V)	Interrupting Rating (AC/DC)	Nominal Resistance (Ohms) <sup>1</sup>	Nominal Melting I <sup>2</sup> t (A <sup>2</sup> Sec.) <sup>2</sup>	Nominal Voltage Drop At Rated Current (V) <sup>3</sup>	Nominal Power Dissipation At Rated Current (W)	Agency Approvals	
								cULUS	SP
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	50 A @ 63 V AC/DC	0.8384	0.0399	0.4831	0.242	X	X
0.750	.750	63		0.4624	0.1162	0.3983	0.299	X	X
1.00	001.	50	50 A @ 50 VAC/DC	0.3096	0.2200	0.3457	0.346	X	X
1.25	1.25	50		0.2265	0.3900	0.3240	0.405	X	X
1.50	01.5	50		0.1759	0.5080	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		0.0385	0.4700	0.0792	0.158	X	X
2.50	02.5	32	50 A @ 32 V AC/DC	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.

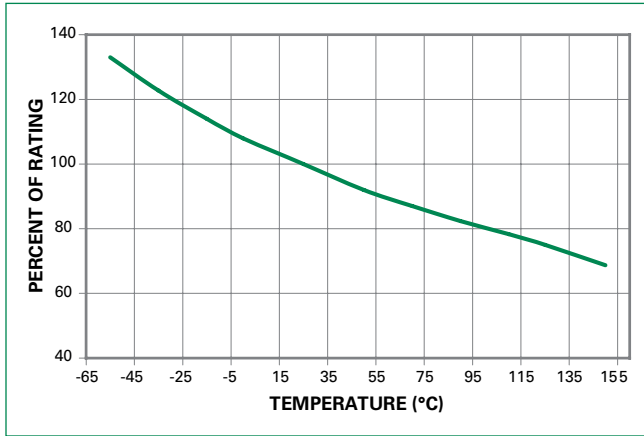
Devices designed to carry rated current for 4 hours minimum. It is recommended that devices be operated continuously at no more than 80% rated current. See "Temperature Derating Curve" for additional derating information.

Devices designed to be mounted with marking code facing up.

# 440 Series

## 1206 High I<sup>2</sup>t Fuse

Temperature Derating Curve



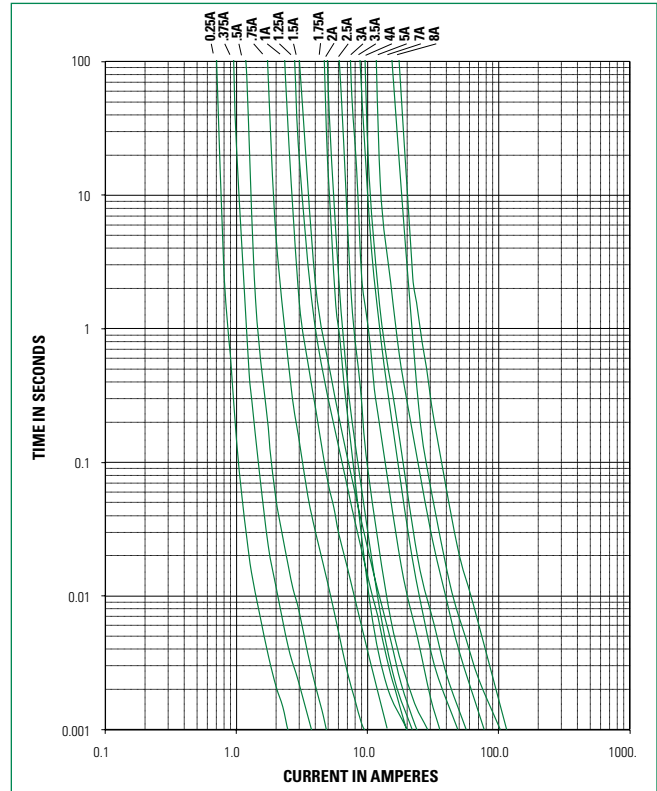
**Note:**

1. 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:  
 $I = (0.80)(0.85)_{75} = (0.68)_{75}$

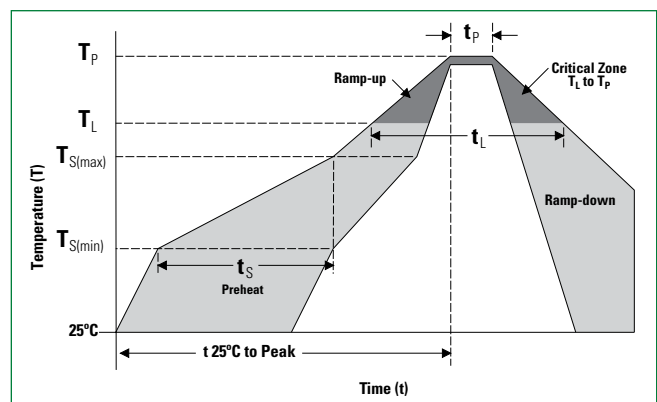
Average Time Current Curves



## Soldering Parameters

<b>Reflow Condition</b>		Pb-free assembly
<b>Pre Heat</b>	- Temperature Min ( $T_{s(min)}$ )	150°C
	- Temperature Max ( $T_{s(max)}$ )	200°C
	- Time (Min to Max) ( $t_s$ )	60 – 180 seconds
<b>Average Ramp-Up Rate (Liquidus Temp (<math>T_L</math>) to peak)</b>		3°C/second max.
<b><math>T_{s(max)}</math> to <math>T_L</math> - Ramp-up Rate</b>		5°C/second max.
<b>Reflow</b>	- Temperature ( $T_L$ ) (Liquidus)	217°C
	- Temperature ( $t_L$ )	60 – 150 seconds
<b>Peak Temperature (<math>T_p</math>)</b>		260 <sup>+0/-5</sup> °C
<b>Time within 5°C of actual peak Temperature (<math>t_p</math>)</b>		10 – 30 seconds
<b>Ramp-down Rate</b>		6°C/second max.
<b>Time 25°C to peak Temperature (<math>T_p</math>)</b>		8 minutes max.
<b>Do not exceed</b>		260°C

<b>Wave Soldering</b>	260°C, 10 seconds max.
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# 440 Series

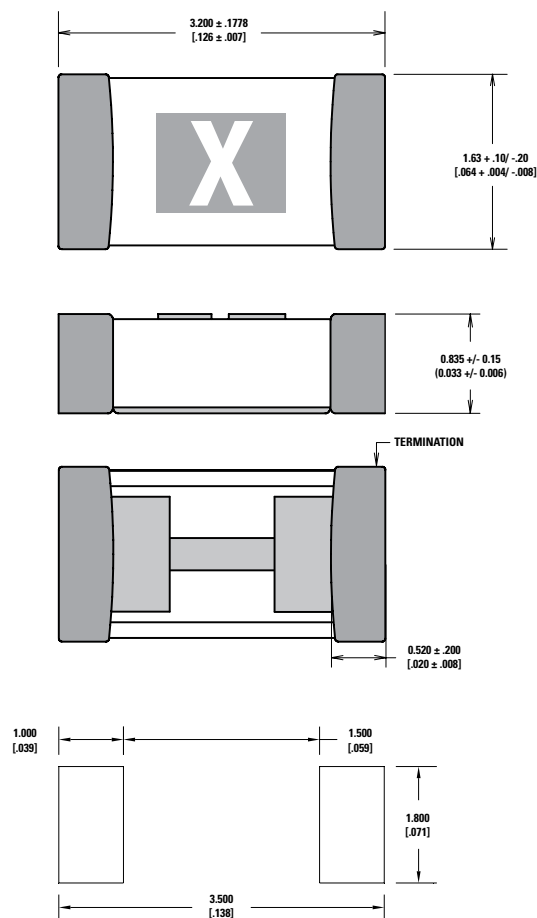
## 1206 High I<sup>2</sup>t Fuse

### Product Characteristics

<b>Materials</b>	<b>Body:</b> Advanced Ceramic <b>Terminations:</b> Ag / Ni / Sn (100% Lead-free) <b>Element Cover Coating:</b> Lead-free Glass
<b>Moisture Sensitivity Level</b>	IPC/JEDEC J-STD-020, Level 1
<b>Solderability</b>	IPC/ECA/JEDEC J-STD-002, Condition C
<b>Humidity Test</b>	MIL-STD-202, Method 103, Conditions D
<b>Resistance to Solder Heat</b>	MIL-STD-202, Method 210, Condition B

<b>Moisture Resistance</b>	MIL-STD-202, Method 106
<b>Thermal Shock</b>	MIL-STD-202, Method 107, Condition B
<b>Mechanical Shock</b>	MIL-STD-202, Method 213, Condition A
<b>Vibration</b>	MIL-STD-202, Method 201
<b>Vibration, High Frequency</b>	MIL-STD-202, Method 204, Condition D
<b>Dissolution of Metallization</b>	IPC/ECA/JEDEC J-STD-002, Condition D
<b>Terminal Strength</b>	IEC 60127-4

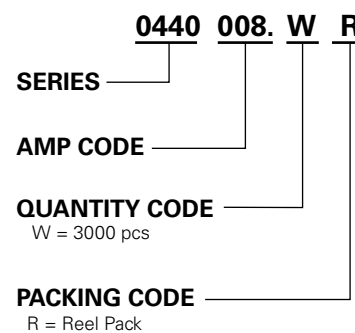
### Dimensions mm (inches)



### 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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