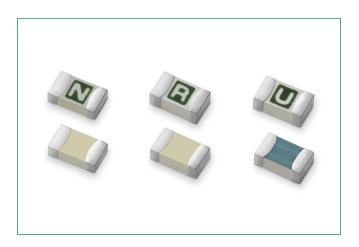
## **441 Series** 0603 High I2t Fuse





#### **Description**

This 100% Lead-free, RoHS compliant and Halogen-free fuse series has been designed specifically to provide over current protection to circuits that see high working ambient temperatures (up to 150°C) and high inrush currents.

The fuse 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 & Benefits**

- Operating Temperature from -55°C to 150°C
- 100% Lead-free, Halogen-Free and RoHS compliant
- Suitable for both leaded and lead-free reflow / wave soldering
- Ultra high l²t values

#### **Additional Information**



Resources





Accessories Samples

### **Applications**

- Handheld Electronics
- LCD Displays
- Battery Packs
- Hard Disk Drives
- SD Memory Cards

#### **Agency Approvals**

Agency	Agency File Number	Ampere Range
c <b>'RL</b> °us	E10480	2A - 6A
<b>®</b> :	29862	2A - 6A

#### **Electrical Characteristics**

% of Ampere Rating	Ampere Rating	Opening Time at 25°C
100%	2A - 6A	4 Hours Minimum
350%	2A - 6A	5 Seconds Maximum

#### **Electrical Specifications**

Ampere Rating (A)  Amp Max. Voltage Rating (V)		Interrupting Rating	Nominal Nominal		Nominal Voltage	Nominal Power	Agency Approvals		
			Resistance (Ohms) <sup>1</sup>	Melting I <sup>2</sup> t (A <sup>2</sup> Sec.) <sup>2</sup>	Drop At Rated Current (V) <sup>3</sup>	Dissipation At Rated Current (W)	c <b>W</b> us	<b>@</b> ;	
2	002.	32		0.0302	0.3103	0.0551	0.110	Χ	Χ
2.5	02.5	32		0.0200	0.640	0.0534	0.134	Χ	Χ
3	003.	32	50 A @ 32 VDC	0.0158	1.100	0.0531	0.159	Χ	Χ
3.5	03.5	32		0.0117	1.270	0.0468	0.164	Χ	Χ
4	004.	32		0.0097	1.710	0.0475	0.190	Χ	Χ
5	005.	32		0.0073	2.880	0.0472	0.236	X	Χ
6	006.	32		0.0056	4.390	0.0464	0.278	Χ	Χ

- Nominal Resistance measured with < 10% rated current.
- Nominal Melting I²t measured at 1 msec. opening time.
   Nominal Voltage Drop measured at rated current after temperature has stabilized.

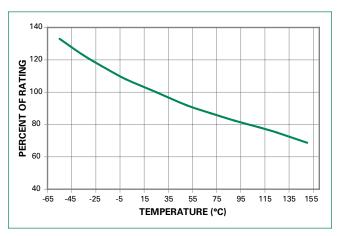
Devices designed to carry out rated current for 4 hours minimum. It is recommended that devices be operated continuously at no more than 80% rated current. See "Temperature Re-rating Curve" for additional re-rating

Devices designed to be mounted with marking code facing up.



# **441 Series** 0603 High I<sup>2</sup>t Fuse

#### **Temperature Re-rating Curve**

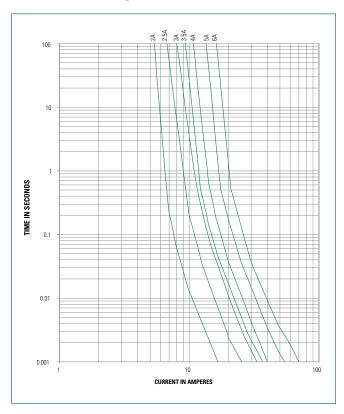


#### Note:

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

For continuous operation at 75 degrees celsius, the fuse should be rerated as follows:  $I = (0.80)(0.85)I_N = (0.68)I_N$ 

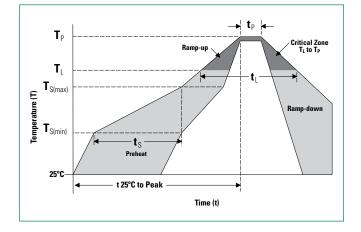
#### **Average Time Current Curves**



#### **Soldering Parameters**

Reflow Cond	lition	Pb – free assembly	
Pre Heat	-Temperature Min (T <sub>s(min)</sub> )	150°C	
	-Temperature Max (T <sub>s(max)</sub> )	200°C	
	-Time (Min to Max) (t <sub>s</sub> )	60 – 180 seconds	
Average Ran peak)	np-up Rate (Liquidus Temp (T <sub>L</sub> ) to	3°C/second max.	
$T_{S(max)}$ to $T_L$ -	Ramp-up Rate	5°C/second max.	
Reflow	-Temperature (T <sub>L</sub> ) (Liquidus)	217°C	
	-Temperature (t <sub>L</sub> )	60 – 150 seconds	
Peak Temper	ature (T <sub>P</sub> )	260+0/-5 °C	
Time within	5°C of actual peak Temperature (t <sub>p</sub> )	10 – 30 seconds	
Ramp-down	Rate	6°C/second max.	
Time 25°C to	peak Temperature (T <sub>p</sub> )	8 minutes max.	
Do not exceed		260°C	

260°C, 10 seconds max.





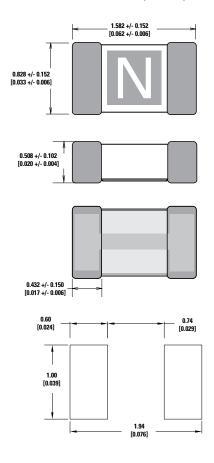
Wave Soldering

#### **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	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
Terminal Strength	IEC 60127-4

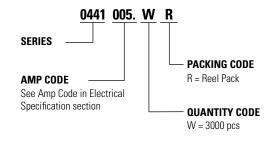
#### **Dimensions mm (inches)**



#### **Part Marking System**

Amp Code	Marking Code
002.	N
02.5	Ο
003.	P
03.5	R
004.	S
005.	Т
006.	U

#### **Part Numbering System**



#### **Packaging**

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

Disclaimer Notice - Littelfuse products are not designed for, and shall not be used for, any purpose (including, without limitation, automotive, military, aerospace, medical, life-saving, life-saving,

