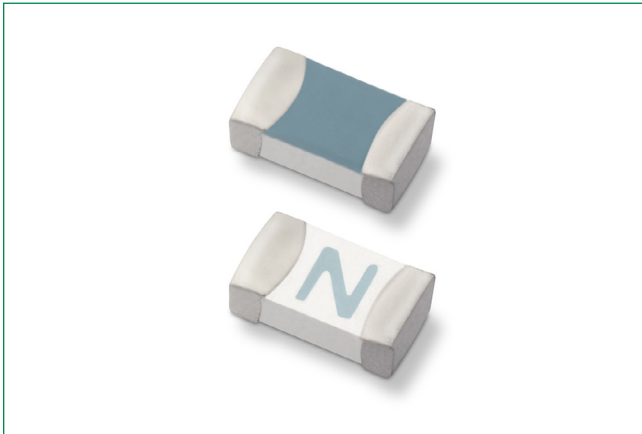


# 438GT Series

## 0603 Fast-Acting Fuse



### Description

The 438GT Series is a 100% Lead-free, RoHS compliant and Halogen-free fuse series designed specifically to provide over-current protection to circuits that operate under high working ambient temperature up to 150°C.

The general design ensures excellent temperature stability and performance reliability.

The high I<sup>2</sup>t values which is typical in the Littelfuse Ceramic Fuse family ensure high inrush current withstand capability.

### Features

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

### 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
cULus	E10480	2A – 6A
SP	29862	2A – 6A

### Electrical Characteristics for Series

% of Ampere Rating	Ampere Rating	Opening Time at 25°C
100%	2A – 6A	4 Hours, Minimum
250%	2A – 6A	5 Seconds, Maximum

### Electrical Specifications by Item

Ampere Rating (A)	Amp Code	Max. Voltage Rating (V)	Interrupting Rating (AC/DC) <sup>1</sup>	Nominal Resistance (Ohms) <sup>2</sup>	Nominal Melting I <sup>2</sup> t (A <sup>2</sup> Sec.) <sup>3</sup>	Nominal Voltage Drop At Rated Current (V) <sup>4</sup>	Nominal Power Dissipation At Rated Current (W)	Agency Approvals	
								cULus	SP
2	002.	32	50A @ 32VDC/12VAC	0.0490	0.181	0.110	0.220	x	x
2.5	02.5	32		0.0364	0.240	0.094	0.235	x	x
3	003.	32		0.0264	0.439	0.082	0.246	x	x
3.5	03.5	32		0.0210	0.647	0.078	0.273	x	x
4	004.	32		0.0164	0.739	0.075	0.300	x	x
5	005.	32	50A @ 24VDC/12VAC	0.0127	0.747	0.072	0.360	x	x
6	006.	24		0.0086	1.444	0.070	0.420	x	x

#### Notes:

1. AC Interrupting Rating tested at rated voltage with unity power factor.

DC Interrupting Rating tested at rated voltage with time constant <0.8 msec.

2. Nominal Resistance measured with <10% rated current.

3. Nominal Melting I<sup>2</sup>t measured at 1msec. opening time.

4. 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.

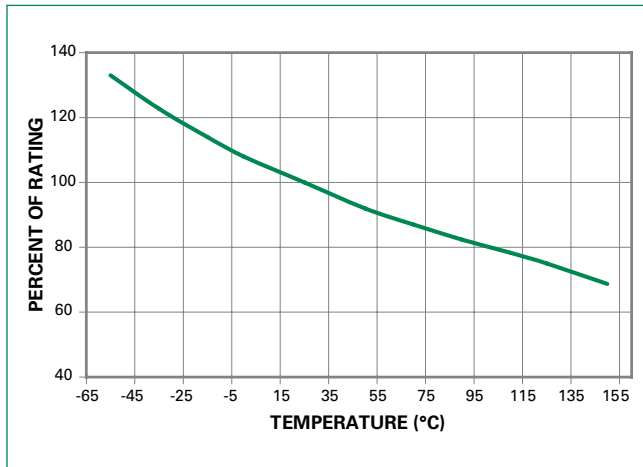
See "Temperature Re-rating Curve" for additional re-rating information.

Devices designed to be mounted with marking code facing up.

# 438GT Series

## 0603 Fast-Acting Fuse

### Temperature Re-rating Curve


**Note:**

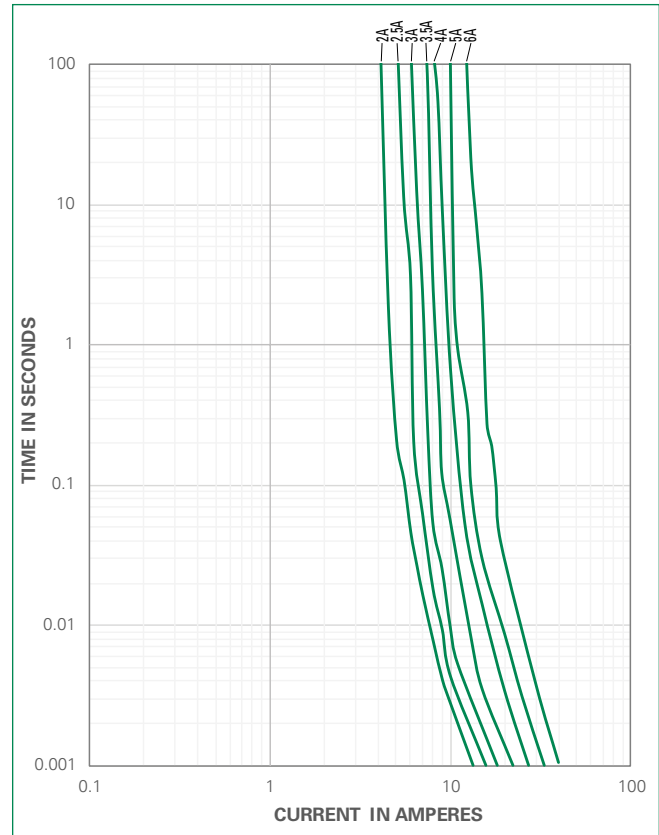
1. Re-rating depicted in this curve is in addition to the standard re-rating of 20% for continuous operation.

**Example:**

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

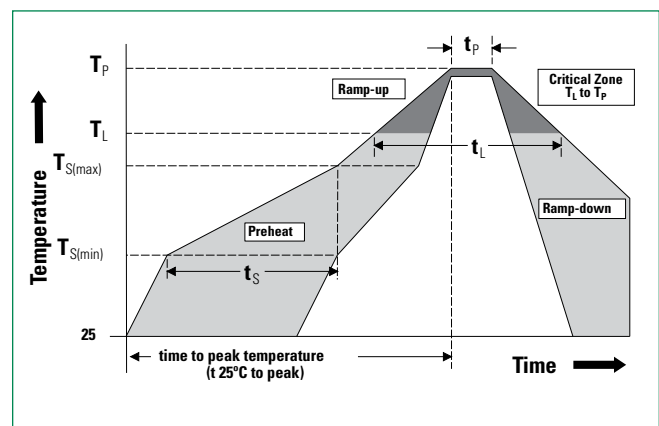
$$I = (0.80)(0.85)_{I_{RAT}} = (0.68)_{I_{RAT}}$$

### 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.



# 438GT Series

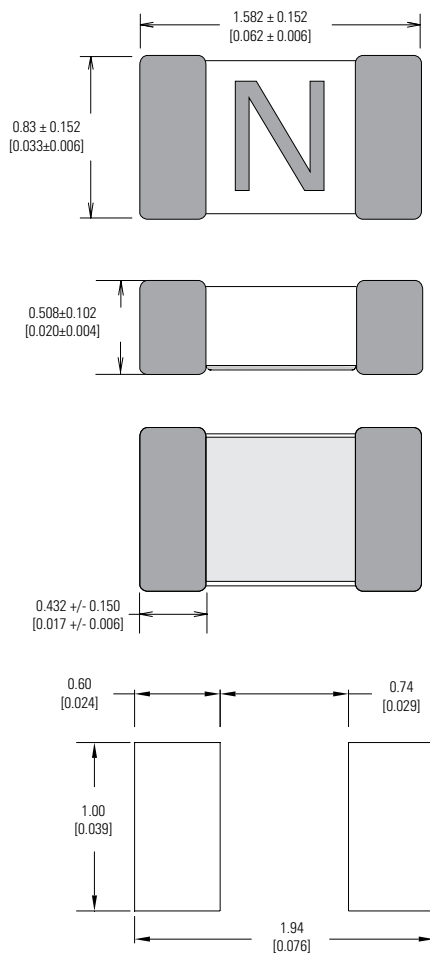
## 0603 Fast-Acting Fuse

### 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/EIC/JEDEC J-STD-002, Condition B
<b>Humidity</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-3
<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/EIC/JEDEC J-STD-002, Condition D
<b>Terminal Strength</b>	IEC 60127-4

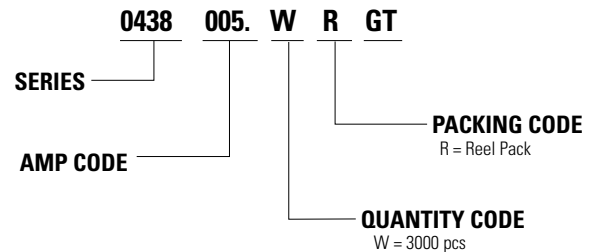
### Dimensions



### Part Marking System

Amp Code	Marking Code
002.	<b>N</b>
02.5	<b>O</b>
003.	<b>P</b>
03.5	<b>R</b>
004.	<b>S</b>
005.	<b>T</b>
006.	<b>U</b>

### Part Numbering System



### Packaging

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

**Disclaimer Notice** - Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at [www.littelfuse.com/disclaimer-electronics](http://www.littelfuse.com/disclaimer-electronics).