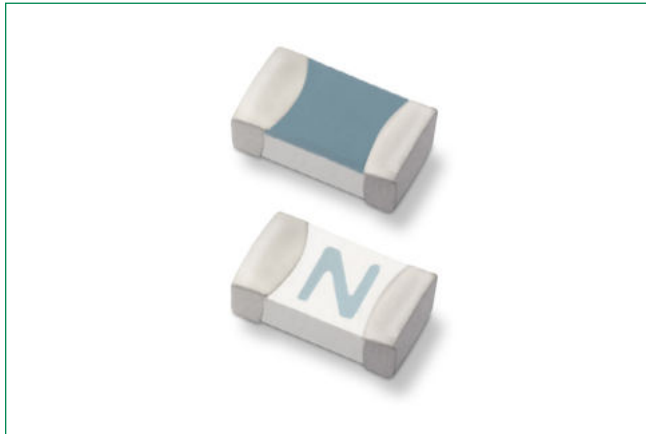


# 438GT Series

## 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
	E10480	2A – 6A
	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	
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

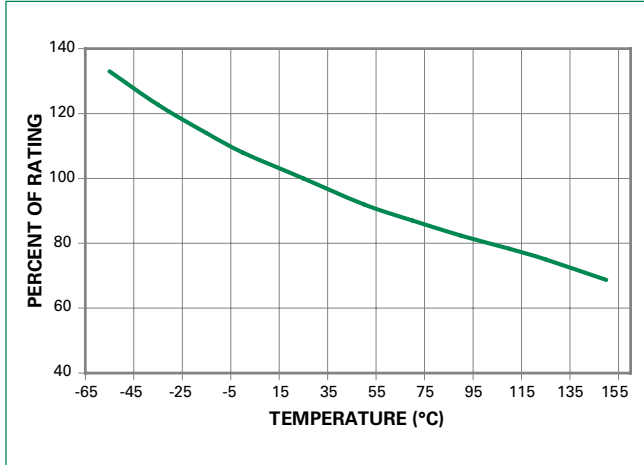
#### Notes:

- AC Interrupting Rating tested at rated voltage with unity power factor.  
DC Interrupting Rating tested at rated voltage with time constant <0.8 msec.
- Nominal Resistance measured with <10% rated current.
- Nominal Melting I<sup>2</sup>t measured at 1msec. opening time.
- 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

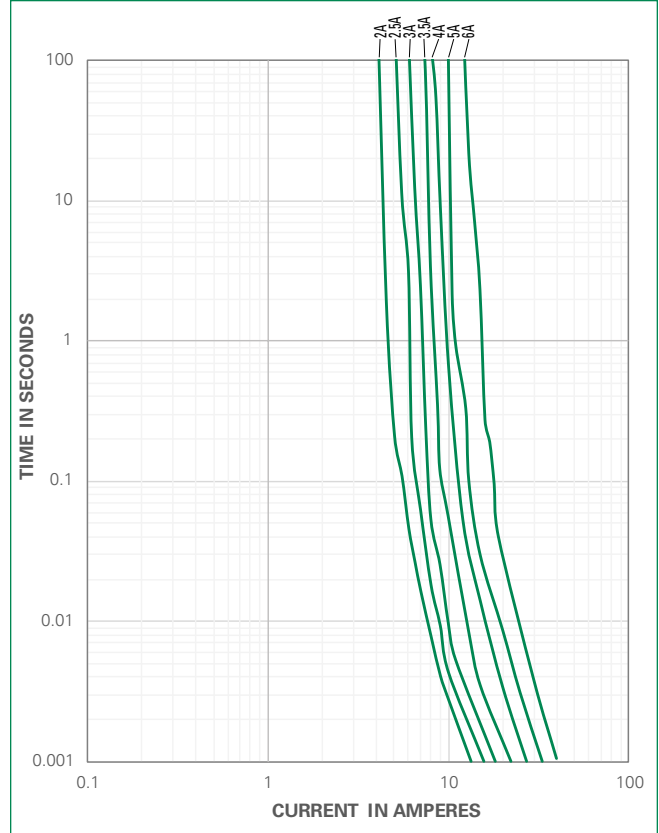
## 0603 Fast-Acting Fuse

Temperature Re-rating Curve



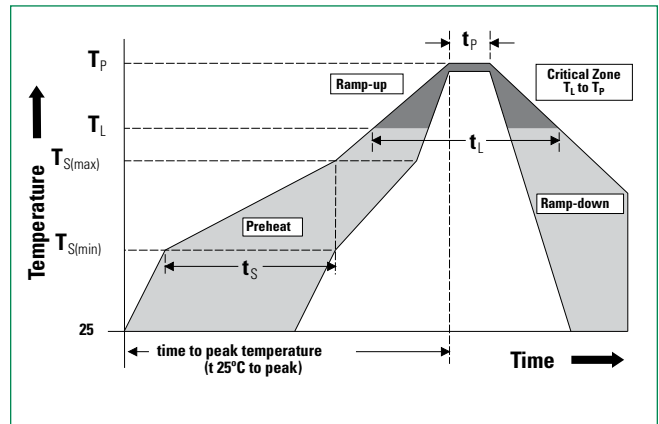
**Note:**  
 1. Re-rating depicted in this curve is in addition to the standard re-rating of 20% for continuous operation.  
**Example:**  
 For continuous operation at 75 degrees celsius, the fuse should be rerated as follows:  
 $I = (0.80)(0.85)_{\text{CONT}} = (0.68)_{\text{CONT}}$

Average Time Current Curves



### Soldering Parameters

<b>Reflow Condition</b>	Pb – free assembly	
<b>Pre Heat</b>	- Temperature Min ( $T_{s(\text{min})}$ )	150°C
	- Temperature Max ( $T_{s(\text{max})}$ )	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(\text{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

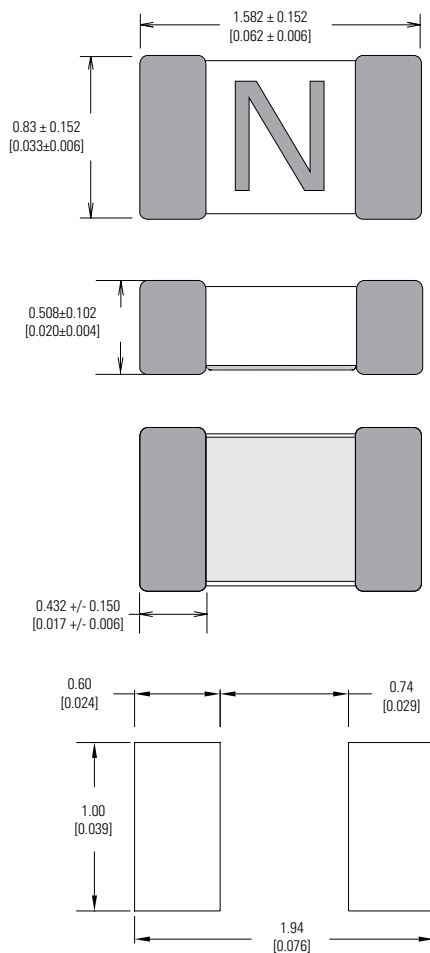
## 0603 Fast-Acting Fuse

### 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

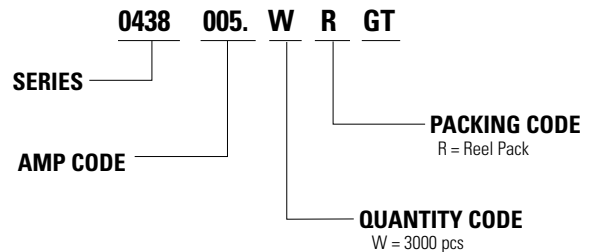
### Dimensions



### 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

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