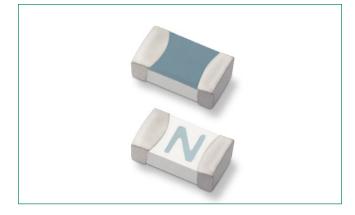


### **Surface Mount Fuses**

Ceramic Fuse > 438GT Series

### 438GT Series – 0603 Fast-Acting Fuse



### Agency Approvals

Agency	Agency File Number	Ampere Range
c <b>N</b> us	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

### 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
- Suitable for both leaded and lead-free reflow/ wave soldering

- 100% Lead-free, RoHS compliant and Halogen-free
- Recognized to UL/CSA/ NMX 248-1 and UL/CSA/ NMX 248-14

Hard Disk Drives

### Applications

- Handheld Electronics
- LCD Displays
  - SD Memory Cards
- Battery Packs

### Additional Information







Datasheet



#### **Electrical Specifications by Item**

Ampere		Max.		Nominal	Nominal	Nominal Voltage	Nominal Power	Agency Approvals	
Rating (A)	Code S. (AC/DC)		Resistance Melting I <sup>2</sup> t (Ohms) <sup>2</sup> (A <sup>2</sup> Sec.) <sup>3</sup>		Drop At Rated Current (V) <sup>4</sup>	Dissipation At Rated Current (W)	c <b>FL</b> us	۹.	
2	002.	32	50A @ 32VDC/12VAC	0.0490	0.181	0.110	0.220	х	х
2.5	02.5	32		0.0364	0.240	0.094	0.235	х	х
3	003.	32		0.0264	0.439	0.082	0.246	х	х
3.5	03.5	32		0.0210	0.647	0.078	0.273	х	х
4	004.	32		0.0164	0.739	0.075	0.300	х	х
5	005.	32		0.0127	0.747	0.072	0.360	х	х
6	006.	24	50A @ 24VDC/12VAC	0.0086	1.444	0.070	0.420	х	х

#### 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.

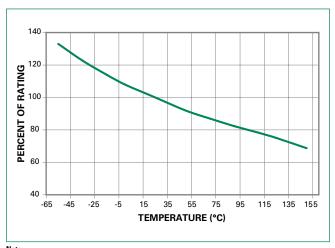
Devices designed to be mounted with marking code facing up.



### **Surface Mount Fuses**

Ceramic Fuse > 438GT Series

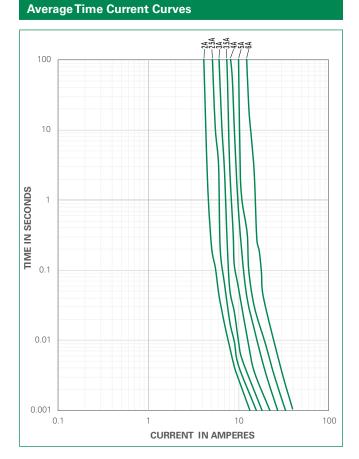




### Note:

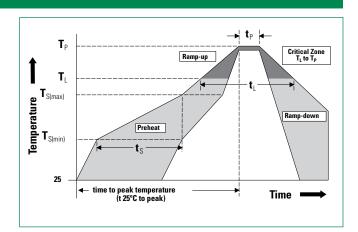
1. Re-rating depicted in this curve is in addition to the standard re-rating of 20% for continuous operation. Example: For continuous operation at 75 degrees celsius, the fuse should be rerated as follows:

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



### **Soldering Parameters**

Reflow Condition		Pb – free assembly		
	- Temperature Min	(T <sub>s(min)</sub> )	150°C	
Pre Heat	- Temperature Max	200°C		
	- Time (Min to Max) (t <sub>s</sub> )		60 – 180 seconds	
Average Ramp-up Rate (Liquidus Temp (T <sub>L</sub> ) to peak)			3°C/second max.	
T <sub>S(max)</sub> to T <sub>L</sub> - 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 Temperature (T <sub>P</sub> )		260 <sup>+0/-5</sup> °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		
Wave Soldering 260°C, 10 seconds max.		nax.		





### **Surface Mount Fuses**

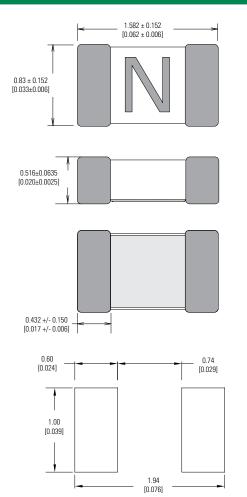
Ceramic Fuse > 438GT Series

#### **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/EIC/JEDEC J-STD-002, Condition B		
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-3
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/EIC/JEDEC J-STD-002, Condition D
Terminal Strength	IEC 60127-4

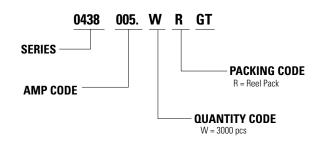
### Dimensions



## Part Marking System

Amp Code	Marking Code
002.	N
02.5	0
003.	Р
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, Part 3	3000	WR

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