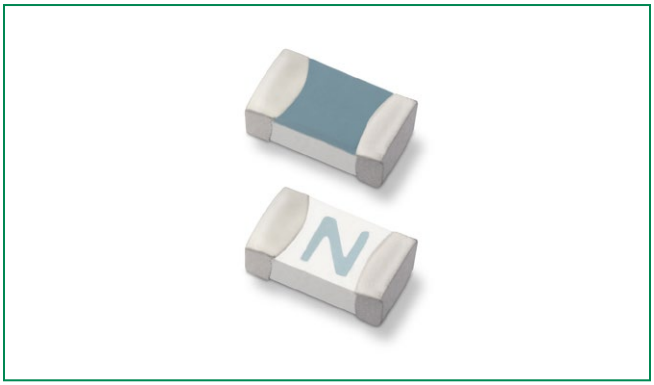
438GT Series – 0603 Fast-Acting Fuse



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 I²t 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

Applications

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

Agency Approvals

AGENCY	AGENCY FILE NUMBER	AMPERE RANGE
c UL us	E10480	2A – 6A
CSA	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

Additional Information

Datasheet | Resources | Samples

Electrical Specifications by Item

Ampere Rating (A)	Amp Code	Max. Voltage Rating (V)	Interrupting Rating (AC/DC) [1]	Nominal Resistance (Ohms) [2]	Nominal Melting I²t (A²Sec.) [3]	Nominal Voltage Drop At Rated Current (V) [4]	Nominal Power Dissipation At Rated Current (W)	Agency Approvals	
								c UL us	CSA
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		0.0127	0.747	0.072	0.360	x	x
6	006.	24	50A @ 24VDC/12VAC	0.0086	1.444	0.070	0.420	x	x

Notes:

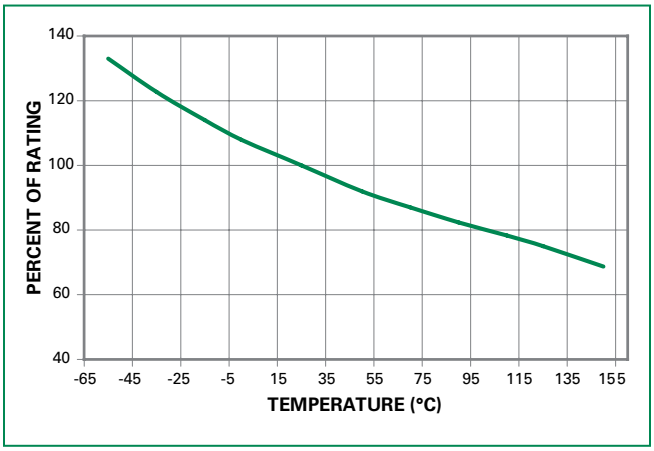
1. AC Interrupting Rating tested at rated voltage with unity power factor.
   DC Interrupting Rating tested at rated voltage with time constant <0.8 msec.
2. Nominal Resistance measured with <10% rated current.
3. Nominal Melting I²t measured at 1msec. opening time.
4. Nominal Voltage Drop measured at 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.

Revised: 02/15/18

Temperature Re-rating Curve



Note:

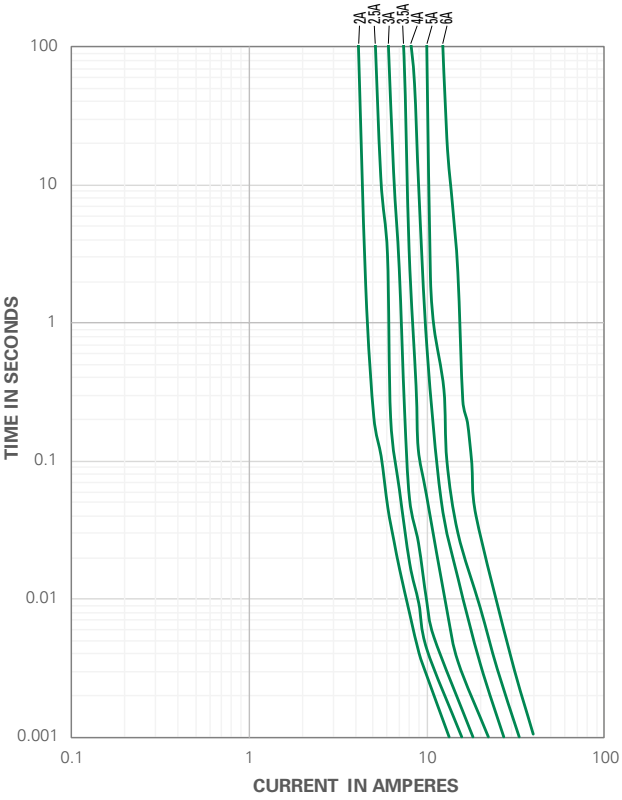
1. Re-rating depicted in this curve is in addition to the standard re-rating of 20% for continuous operation.

Example:

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

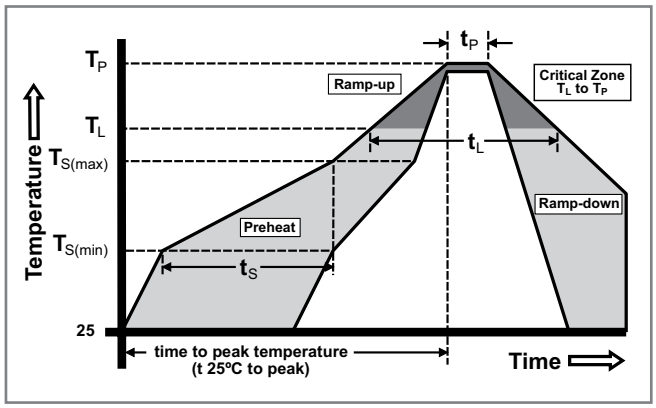
$I = (0.80)(0.85)I_{RAT} = (0.68)I_{RAT}$

Average Time Current Curves



Soldering Parameters

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



Wave Soldering	260°C, 10 seconds max.

Revised: 02/15/18

Surface Mount Fuses

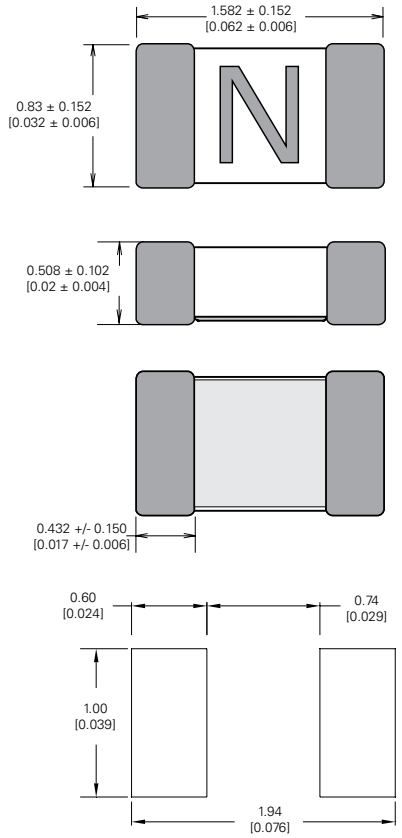
Ceramic Fuse > 438GT Series

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

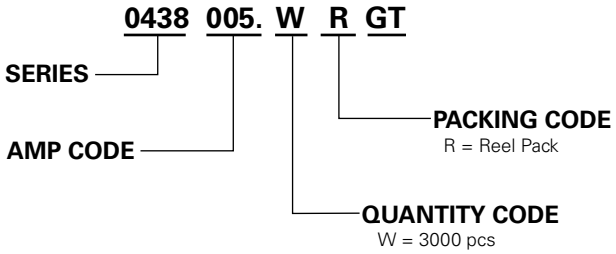
Dimensions



Part Marking System

Amp Code	Marking Code
002.	**N**
02.5	**O**
003.	**P**
03.5	**R**
004.	**S**
005.	**T**
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