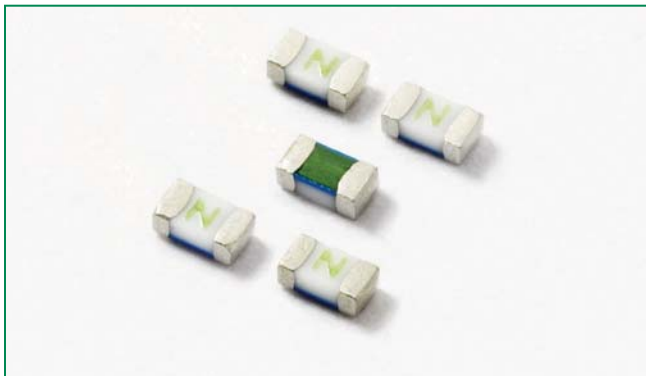


RoHS HF 438 Series – 0603 Fast-Acting Fuse





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).

The general design ensures excellent temperature stability and performance reliability.

In addition to this, the high i^2t values typical of the Littelfuse Thin-Film fuse family ensure high inrush current withstand capability.

Agency Approvals

AGENCY	AGENCY FILE NUMBER	AMPERE RANGE
	E10480	0.250A ~ 6A
	E10480	0.250A ~ 6A

Features

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



Electrical Characteristics for Series

% of Ampere Rating	Ampere Rating	Opening Time at 25°C
100%	0.250A ~ 6A	4 Hours Minimum
250%	0.250A ~ 6A	5 Seconds Maximum

Applications

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

Electrical Specifications by Item

Ampere Rating (A)	Amp Code	Max. Voltage Rating (V)	Interrupting Rating	Nominal Resistance (Ohms) ²	Nominal Melting I^2t (A ² Sec.) ³	Nominal Voltage Drop At Rated Current (V) ⁴	Nominal Power Dissipation At Rated Current (W)	Agency Approvals	
									
250mA	.250	32	50 A @ 32 VDC	2.024	0.0017	0.550	0.138	x	x
375mA	.375	32		1.247	0.0041	0.488	0.183	x	x
500mA	.500	32		0.829	0.0100	0.486	0.243	x	x
750mA	.750	32		0.466	0.0281	0.378	0.284	x	x
1A	001.	32		0.310	0.0593	0.351	0.351	x	x
1.25A	1.25	32		0.200	0.0510	0.365	0.456	x	x
1.5A	01.5	32		0.174	0.0902	0.368	0.552	x	x
1.75A	1.75	32		0.125	0.1440	0.360	0.540	x	x
2A	002.	32		0.0440	0.1490	0.107	0.214	x	x
2.5A	02.5	32		0.0324	0.1977	0.095	0.238	x	x
3A	003.	32		0.0252	0.2922	0.093	0.279	x	x
3.5A	03.5	32		0.0203	0.4752	0.082	0.287	x	x
4A	004.	32		0.0169	0.6920	0.079	0.316	x	x
5A	005.	32		0.0113	0.7398	0.074	0.370	x	x
6A	008.	24	50 A @ 24 VDC	0.0087	1.3838	0.072	0.432	x	x

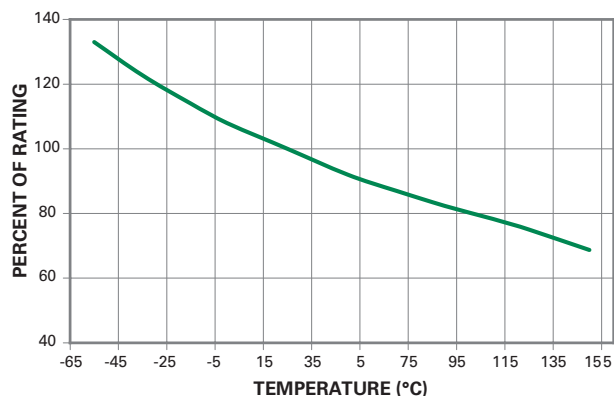
Notes:

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

Temperature Derating Curve



Note:

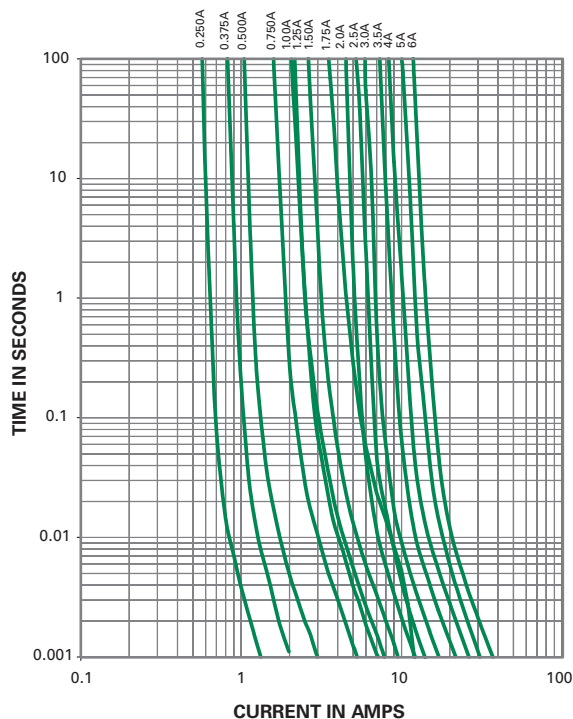
- Derating depicted in this curve is in addition to the standard derating of 20% for continuous operation.

Example:

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

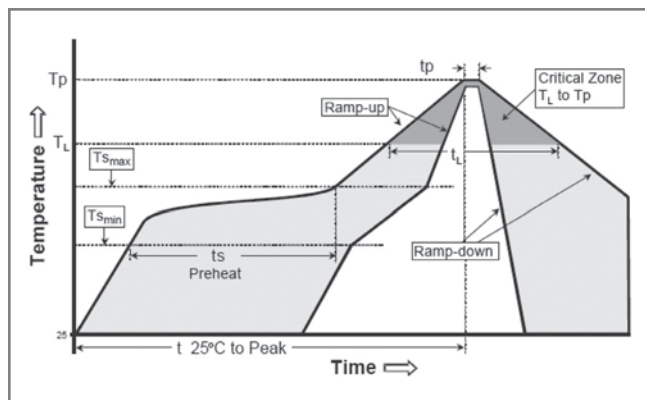
$$I = (0.80)((0.85)I_{RAT} = (0.68)I_{RAT}$$

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 secs
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



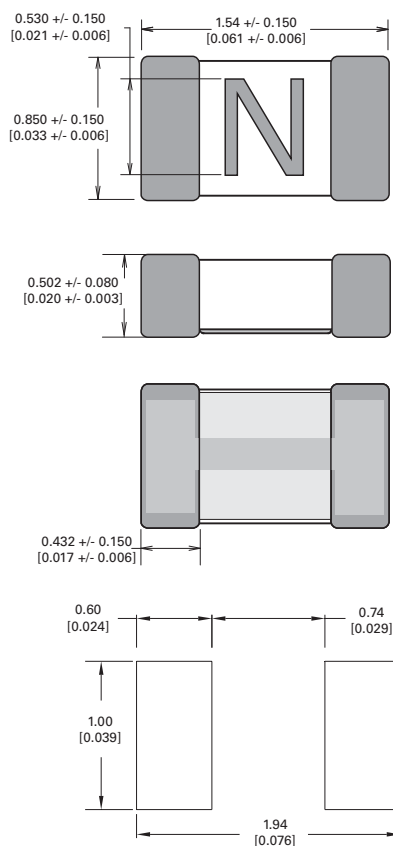
Wave Soldering	260°C, 10 seconds max.
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Product Characteristics

Materials	Body: Advanced Ceramic Terminations: Ag / Ni / Sn (100% Lead-Free) Element Cover Coating: Lead-Free Glass
Moisture Sensitivity Level	IPC/JEDEC J-STD-020C, Level 1
Solderability	IPC/EIC/JEDEC J-STD-002B, Condition B
Humidity	MIL-STD-202, Method 103B, Conditions D
ESD Immunity	IEC 61000-4-2, 8KV Direct
Resistance to Solder Heat	MIL-STD-202, Method 210F, Condition B

Moisture Resistance	MIL-STD-202, Method 106G
Thermal Shock	MIL-STD-202, Method 107G, Condition B-3
Mechanical Shock	MIL-STD-202, Method 213B, Condition A
Vibration	MIL-STD-202, Method 201A
Vibration, High Frequency	MIL-STD-202, Method 204D, Condition D
Dissolution of Metallization	IPC/EIC/JEDEC J-STD-002B, Condition D
Terminal Strength	IEC 60127-4

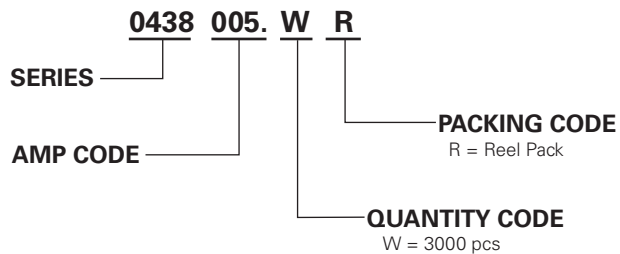
Dimensions



Part Marking System

Amp Code	Marking Code
.250	D
.375	E
.500	F
.750	G
001.	H
1.25	J
01.5	K
1.75	L
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-481-1 (IEC 286, part 3)	3000	WR