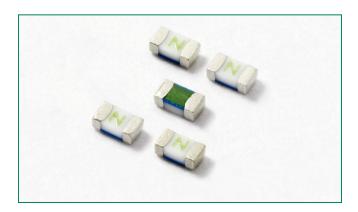
Surface Mount Fuses

Ceramic Fuse > 438 Series

438 Series - 0603 Fast-Acting Fuse





Agency Approvals

AGENCY	AGENCY FILE NUMBER	AMPERE RANGE
c FN °us	E10480	0.250A – 6A
⊕ `	29862	0.250A – 6A

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		

Description

The 438 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 Halogenfree
- Suitable for both leaded and lead-free reflow / wave soldering

Applications

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

Additional Information







Resource



Sample

Electrical Specifications by Item

Ampere	ıΔmn		Interrupting Rating	Nominal Nominal Resistance (Ohms) ² (A ² Sec.) ³	Nominal	Nominal Voltage	Nominal Power	Agency Approvals	
Rating (A)					Drop At Rated Current (V) ⁴	Dissipation At Rated Current (W)	c 71 2°us	⊕ ;	
0.250	.250	63VDC		2.218	0.0017	0.550	0.138	Х	Х
0.375	.375	63VDC		1.247	0.0041	0.488	0.183	X	Х
0.500	.500	63VDC		0.829	0.0100	0.486	0.243	X	Х
0.750	.750	63VDC	50A @ 63VDC	0.466	0.0281	0.378	0.284	Х	Х
1.00	001.	63VDC	50A @ 32VAC	0.310	0.0593	0.351	0.351	X	Х
1.25	1.25	63VDC		0.200	0.0510	0.365	0.456	Х	Х
1.50	01.5	63VDC		0.174	0.0902	0.368	0.552	Х	Х
1.75	1.75	63VDC		1.405	0.1440	0.360	0.540	X	Х
2.00	002.	32		0.051	0.1490	0.107	0.214	Х	Х
2.50	02.5	32		0.0324	0.1977	0.095	0.238	Х	Х
3.00	003.	32	EOV @ 33//DC/13//VC	0.0255	0.2922	0.093	0.279	X	Х
3.50	03.5	32	50A @ 32VDC/12VAC	0.0205	0.4752	0.082	0.287	Х	Х
4.00	004.	32		0.0170	0.6920	0.079	0.316	Х	Х
5.00	005.	32		0.0115	0.7398	0.074	0.370	Х	Х
6.00	006.	24	50A @ 24VDC/12VAC	0.0085	1.3838	0.072	0.432	X	Х

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.
- 2. Nominal Resistance measured with < 10% rated current.
- 3. Nominal Melting I^2t measured at 1 msec. opening time.
- 4. Nominal Voltage Drop measured at rated current after temperature has stabilized.

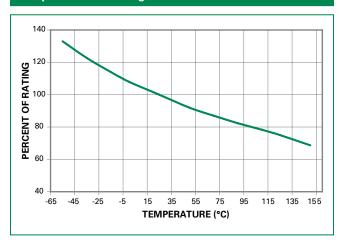
Devices designed to carry rated current for 4 hours minimum. It is recommended that devices be operated continuously at no more than 80% rated current. See "Temperature Re-rating Curve" for additional re-rating information.

Devices designed to be mounted with marking code facing up.

Ceramic Fuse > 438 Series



Temperature Re-rating Curve



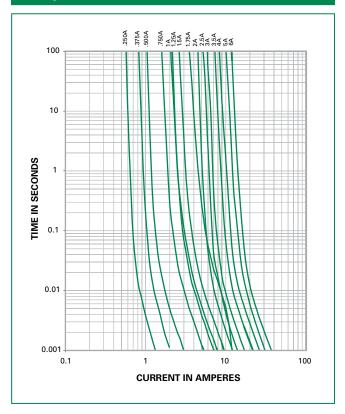
Note:

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

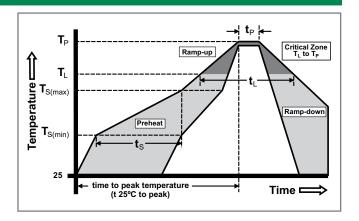
Average Time Current Curves



Soldering Parameters

Reflow Co	ndition	Pb – free assembly
	-Temperature Min (T _{s(min)})	150°C
Pre Heat	-Temperature Max (T _{s(max)})	200°C
	-Time (Min to Max) (t _s)	60 – 180 seconds
Average R (T _L) to pea	amp-up Rate (Liquidus Temp k)	3°C/second max.
T _{S(max)} to T	_L - Ramp-up Rate	5°C/second max.
Reflow	-Temperature (T _L) (Liquidus)	217°C
Reliow	-Temperature (t _L)	60 – 150 seconds
PeakTemp	perature (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 peakTemperature (T _P)	8 minutes max.
Do not exceed		260°C

Wave Soldering	260°C, 10 seconds max.
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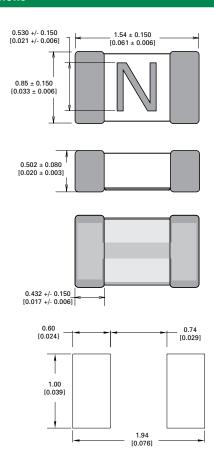


Product Characteristics

Materials	Body: Advanced Ceramic Terminations: Ag / Ni / Sn (100% Lead-free) Element Cover Coating: Lead-free Glass	
Moisture		
Sensitivity Level	IPC/JEDEC J-STD-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

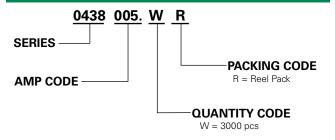


Part Marking System

Amp Code	Marking Code
.250	D
.375	E
.500	F
.750	G
001.	Н
1.25	J
01.5	К
1.75	L

de Marking Co	p Code N	Coc	Amp
N	002.	2.	00
0	02.5	.5	02
P	003.	3.	00
R	03.5	.5	03
S	004.	4.	00
Т	005.	5.	00
U	006.	6.	00

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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