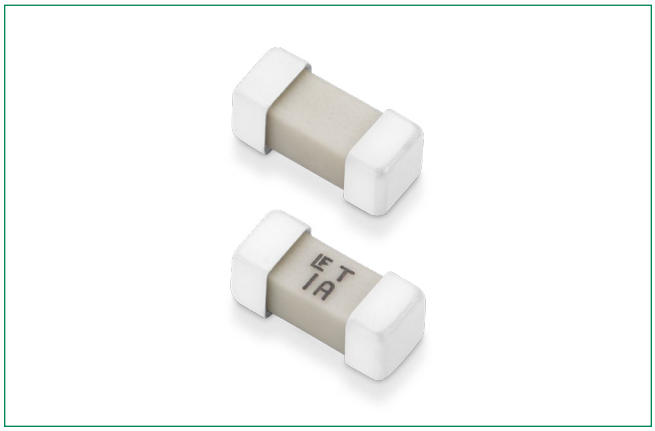
452/454 Series

NANO²® > Slo-Blo® Fuse



Web Resources

Download ECAD models, order samples, and find technical recources at www.littelfuse.com/452

Download ECAD models, order samples, and find technical recources at www.littelfuse.com/454

Agency Approvals

Agency	Agency File Number	Ampere Range
	E10480	0.375A - 12A
	29862	0.375A - 12A
	NBK030205-E10480B	1A - 5A
	J50515033	0.375A - 5A, 6.3A, 10A
	N/A	0.375A - 5A, 6.3A, 10A
	N/A	0.375A - 5A, 6.3A, 10A

Description

The NANO²® Slo-Blo® fuse has enhanced inrush withstand characteristics over the NANO²® Fast-Acting fuse. The unique time delay feature of this fuse design helps solve the problem of nuisance "opening" by accommodating inrush currents that normally cause a fast-acting fuse to open.

Features & Benefits

- Small size
- Wide range of current rating available (0.375A to 12A)
- Wide operating temperature range
- RoHS compliant and Halogen Free
- UL Recognized to UL/CSA/NMX UL 248-1 and UL/CSA/NMX UL 248-14
- Conforms to DENAN's Appendix 3
- Conforms to EN 60127-1 and EN 60127-7
- CE Mark indicates suitability for the European Market
- UKCA Mark indicates suitability for the UK Market

Applications

- Notebook PC
- LCD/PDP TV
- LCD monitor
- LCD/PDP panel
- LCD backlight inverter
- Portable DVD player
- Power supply
- Networking
- PC server
- Cooling fan system
- Storage system
- Telecom system
- Wireless basestation
- White goods
- Game console
- Office Automation equipment
- Battery charging circuit protection
- Industrial equipment

Electrical Characteristics for Series

% of Ampere Rating	Opening Time
100%	4 hours, Minimum
200%	1 sec., Min.; 60 sec., Max.
300%	0.2 sec., Min.; 3 sec., Max
800%	0.002 sec., Min.; 0.1 sec., Max.

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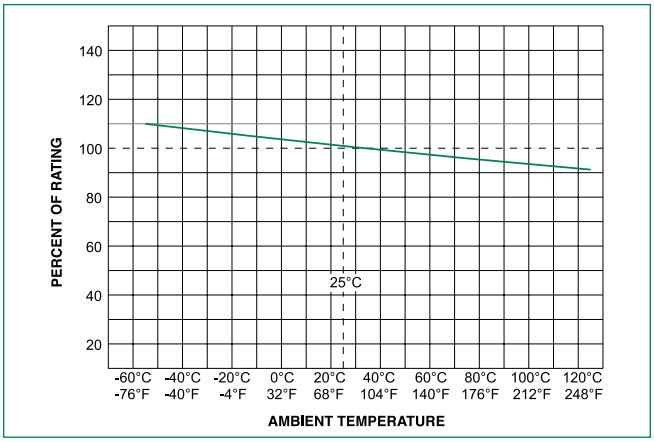
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Electrical Specifications by Item

Ampere Rating (A)	Amp Code	Max Voltage Rating (V)	Interrupting Rating	Nominal Cold Resistance (Ohms)	Nominal Melting I²t (A²sec)	Agency Approvals					
						c UL us				CE	UK CA
0.375	.375	125	50A @ 125 VAC/VDC 300A @ 32 VDC PSE: 100A @ 100 VAC	1.2000	0.101	x	x	-	x	x	x
0.500	.500	125		0.7000	0.240	x	x	-	x	x	x
0.750	.750	125		0.3600	0.904	x	x	-	x	x	x
001.	001.	125		0.2250	1.98	x	x	x	x	x	x
1.50	01.5	125		0.0930	3.65	x	x	x	x	x	x
2.00	002.	125		0.0625	8.20	x	x	x	x	x	x
2.50	02.5	125		0.0450	15.0	x	x	x	x	x	x
3.00	003.	125		0.0340	20.16	x	x	x	x	x	x
3.50	03.5	125		0.0224	26.53	x	x	x	x	x	x
4.00	004.	125		0.0186	34.40	x	x	x	x	x	x
5.00	005.	125		0.0136	53.72	x	x	x	x	x	x
6.30	06.3	75	50A @ 72 VAC 50A @ 60 VDC 100A @ 75 VDC	0.0123	64.0	x	x	-	x	x	x
7.00	007.	75		0.0105	123.83	x	x	-	-	x	x
8.00	008.	75		0.0088	137.34	x	x	-	-	x	x
10.0	010.	75		0.0080	195.0	x	x	-	x	x	x
12.0	012.	75		0.0061	260.46	x	x	-	-	x	x

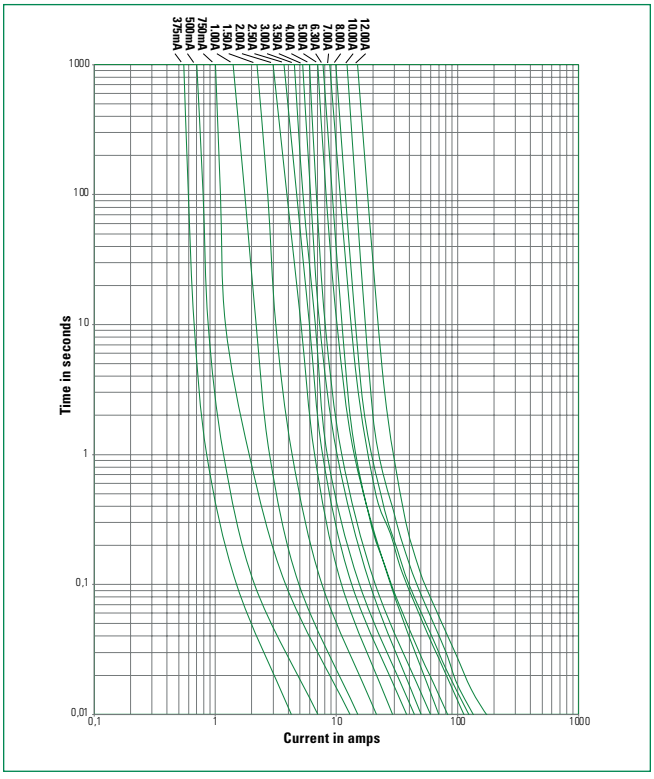
Notes: - I^2t calculated at 8ms.
- Resistance is measured at 10% of rated current, 25ºC

Temperature Re-rating Curve



Note:
1. Rerating depicted in this curve is in addition to the standard derating of 25% for continuous operation.

Average Time Current Curves



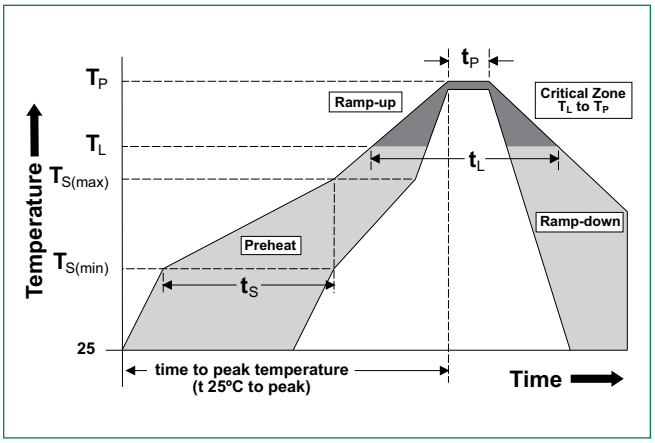
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Soldering Parameters

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		5°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)		20 – 40 seconds
Ramp-down Rate		5°C/second max.
Time 25°C to peak Temperature (T_P)		8 minutes max.
Do not exceed		260°C

Wave Soldering Parameters	260°C Peak Temperature, 3 seconds max.



Product Characteristics

Materials	**Body:** Ceramic **Terminations**: Gold-plated Caps / Sn-dipped Silver Plated Caps (452 Series) Silver-plated Caps (454 Series)
Product Marking	Brand, Ampere Rating
Operating Temperature	-55°C to 125°C
Moisture Sensitivity Level	Level 1, J-STD-020
Solderability	MIL-STD-202, Method 208
Insulation Resistance (after Opening)	MIL-STD-202, Method 302, Test Condition A (10,000 ohms minimum)

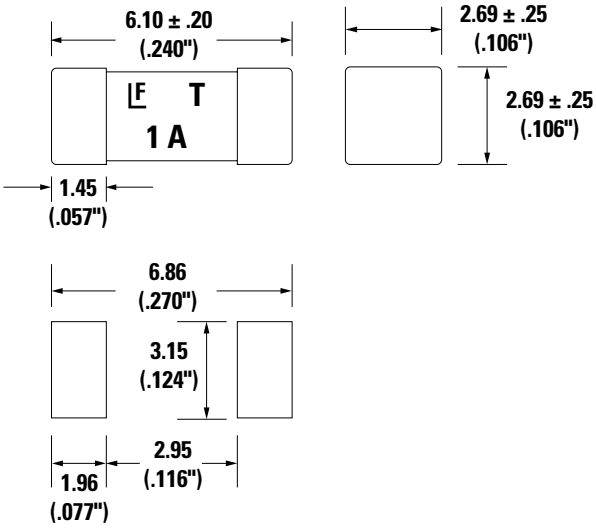
Thermal Shock	MIL-STD-202, Method 107, Test Condition B, 5 cycles, -65°C / +125°C, 15 minutes @ each extreme
Mechanical Shock	MIL-STD-202, Method 213, Test I: Deenergized. 100G's pk amplitude, sawtooth wave 6ms duration, 3 cycles XYZ+xyz = 18 shocks
Vibration	MIL-STD-202, Method 201: 0.03" amplitude, 10-55 Hz in 1 min. 2hrs each XYZ=6hrs
Moisture Resistance	MIL-STD-202, Method 106, 10 cycles
Salt Spray	MIL-STD-202, Method 101, Test Condition B (48hrs)
Resistance to Soldering Heat	MIL-STD-202, Method 210, Test condition B (10 sec at 260°C)

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452/454 Series

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Dimensions



Recommended pad layout

Part Numbering System

0452 001. M R L

Series

Amp Code
Refer to Amp Code column in the Electrical Specifications table.
The dot is positioned at the end of the number sequence with whole ratings and within for fractional ratings.
Example: 0.375 Amp product is 0452.375MRL
(1 amp product shown)

Quantity code
M = 1000 pcs
N = 5000 pcs

Packaging code
R = Tape and Reel

L - RoHS Compliant & Halogen Free (Gold Plated Caps)

SN-RoHS Compliant & Halogen Free (Sn-dipped Caps)

Notes:
452 series may be ordered as "RoHS and HF (Gold Plated Caps)" ("L" suffix).
454 series is available only as "RoHS and HF" version and does not require "L" suffix.
Please do not include "L" suffix within 454 series ordering instructions.

Packaging

Packaging Option	Packaging Specification	Quantity	Quantity & Packaging Code
12mm Tape and Reel	EIA-481 IEC 60286-3	5000	NR
12mm Tape and Reel	EIA-481 IEC 60286-3	1000	MR

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