

452/454 Series

NANO²® > Slo-Blo[®] Fuse



Web Resources









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



Download ECAD models, order samples, and find technical resources 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/PDPTV
- 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.

452/454 Series

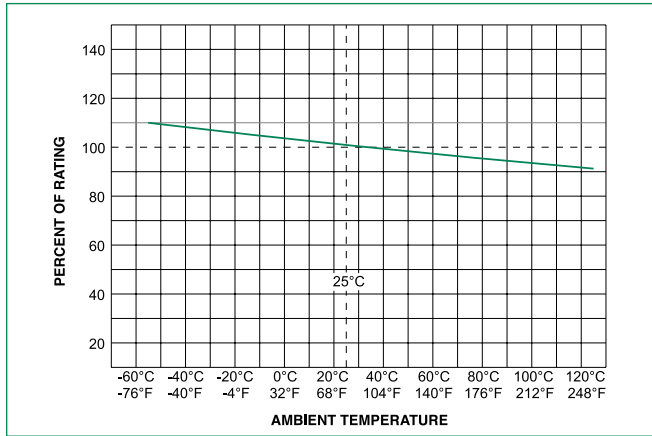
NANO²® > Slo-Blo[®] Fuse

Electrical Specifications by Item

Ampere Rating (A)	Amp Code	Max Voltage Rating (V)	Interrupting Rating	Nominal Cold Resistance (Ohms)	Nominal Melting I ² t (A ² sec)	Agency Approvals						
						UL US	SP	PE	△	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	
1.00	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		0.0123	64.0	x	x	-	-	x	x	
7.00	007.	75		50A @ 72 VAC 50A @ 60 VDC 100A @ 75 VDC	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	
12.0	012.	75	0.0061		260.46	x	x	-	-	x	x	

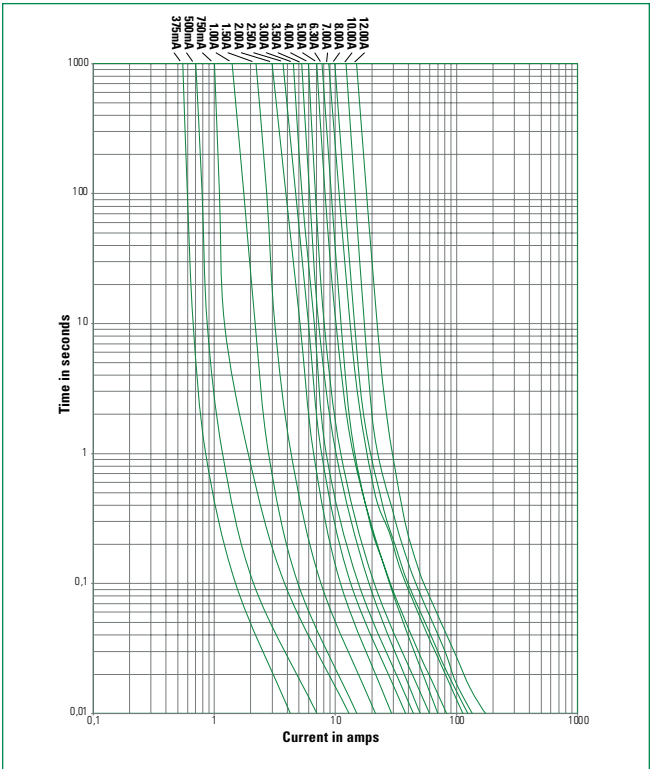
Notes: - I²t calculated at 8ms.
- Resistance is measured at 10% of rated current, 25°C

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



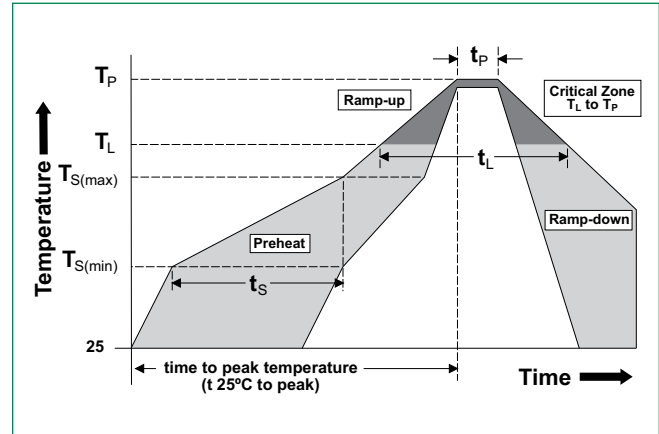
452/454 Series

NANO^{2®} > Slo-Blo[®] Fuse

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

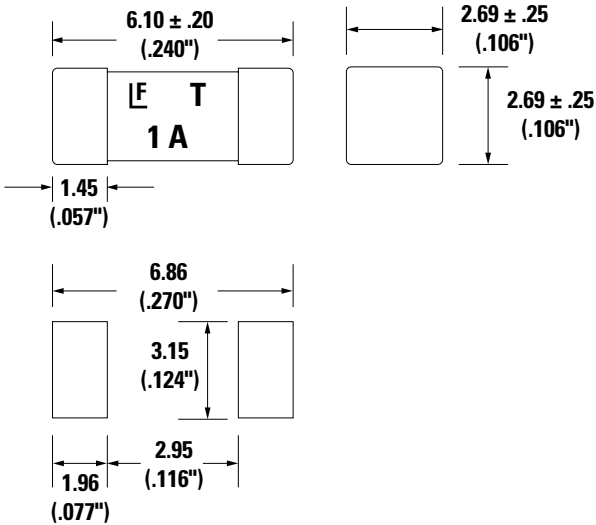
Materials	Body: Ceramic Terminations: Gold-plated Caps / Sn-dipped Silver Plated Caps (452 Series) Silver-plated Caps (454 Series)
Product Marking	Brand, Ampere Rating
Operating Temperature	-55°C to 125°C
Moisture Sensitivity Level	Level 1, J-STD-020
Solderability	MIL-STD-202, Method 208
Insulation Resistance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

452/454 Series

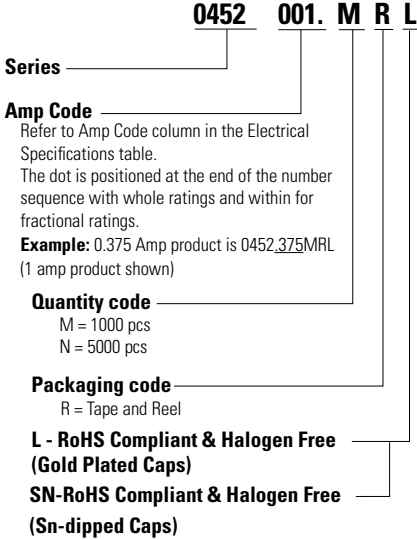
NANO²® > Slo-Blo[®] Fuse

Dimensions



Recommended pad layout

Part Numbering System



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

Disclaimer Notice - Littelfuse products are not designed for, and shall not be used for, any purpose (including, without limitation, automotive, military, aerospace, medical, life-saving, life-sustaining or nuclear facility applications, devices intended for surgical implant into the body, or any other application in which the failure or lack of desired operation of the product may result in personal injury, death, or property damage) other than those expressly set forth in applicable Littelfuse product documentation. Warranties granted by Littelfuse shall be deemed void for products used for any purpose not expressly set forth in applicable Littelfuse documentation. Littelfuse shall not be liable for any claims or damages arising out of products used in applications not expressly intended by Littelfuse as set forth in applicable Littelfuse documentation. The sale and use of Littelfuse products is subject to Littelfuse Terms and Conditions of Sale, unless otherwise agreed by Littelfuse. Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at www.littelfuse.com/disclaimer-electronics.