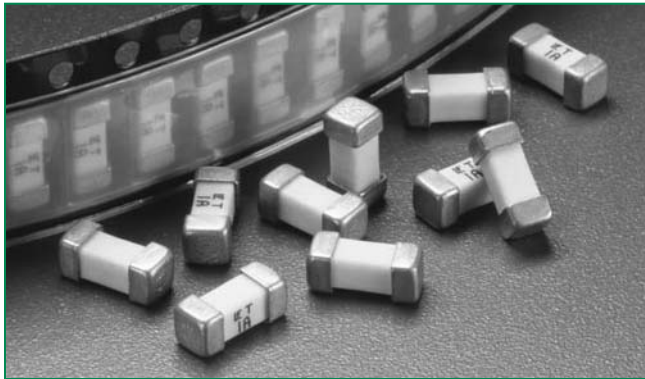


### RoHS HF 452/454 Series Fuse



#### Description

The NANO<sup>2</sup> Slo-Blo® fuse has enhanced inrush withstand characteristics over the NANO<sup>2</sup> 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

- Time-Lag (Slo-Blo)
- Small size
- Wide range of current rating available (375mA to 12A)
- Wide operating temperature range
- Low temperature de-rating
- RoHS compliant
- Halogen Free

#### 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
- Medical equipment
- Automotive




#### Agency Approvals

AGENCY	AGENCY FILE NUMBER	AMPERE RANGE
	E10480	375mA - 12A
	LR29862	375mA - 12A
	NBK030205-E10480B	1A - 5A

#### 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%	0.02 sec., Min.; 0.1 sec., Max.

#### Electrical Specifications by Item

Ampere Rating (A)	Amp Code	Max Voltage Rating (V)	Interrupting Rating	Nominal Cold Resistance (Ohms)	Nominal Melting I <sup>2</sup> t (A <sup>2</sup> sec)	Agency Approvals		
								
0.375	.375	125	50 amperes @ 125 VAC/VDC 300 amperes @ 32 VDC PSE: 100 amperes @ 100 VAC	1.2000	0.101	x	x	
0.500	.500	125		0.7000	0.240	x	x	
0.750	.750	125		0.3600	0.904	x	x	
001.	001.	125		0.2250	1.98	x	x	x
1.50	01.5	125		0.0930	3.65	x	x	x
2.00	002.	125		0.0625	8.20	x	x	x
2.50	02.5	125		0.0450	15.0	x	x	x
3.00	003.	125		0.0340	20.16	x	x	x
3.50	03.5	125		0.0224	26.53	x	x	x
4.00	004.	125		0.0186	34.40	x	x	x
5.00	005.	125		0.0136	53.72	x	x	x
7.00	007.	72		50 amperes @ 72 VAC 50 amperes @ 60 VDC	0.0105	123.83	x	x
8	008.	72	50 amperes @ 72 VAC 50 amperes @ 60 VDC	0.0088	137.34	x	x	
12	012.	72	50 amperes @ 72 VAC 50 amperes @ 60 VDC	0.0061	260.46	x	x	

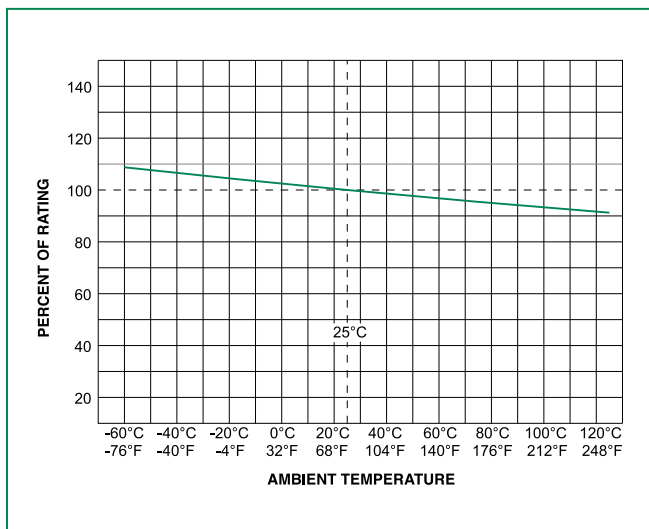
Notes:

- I<sup>2</sup>t calculated at 8ms.
- Resistance is measured at 10% of rated current, 25°C

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Specifications are subject to change without notice.  
Please refer to [www.littelfuse.com/series/452.html](http://www.littelfuse.com/series/452.html)  
or /454.html for current information.

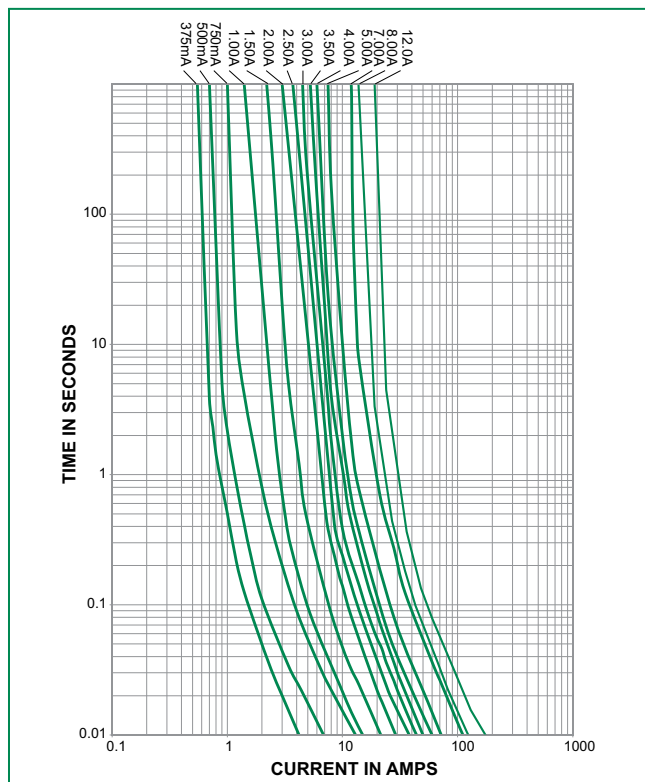
## Temperature Derating Curve



Note:

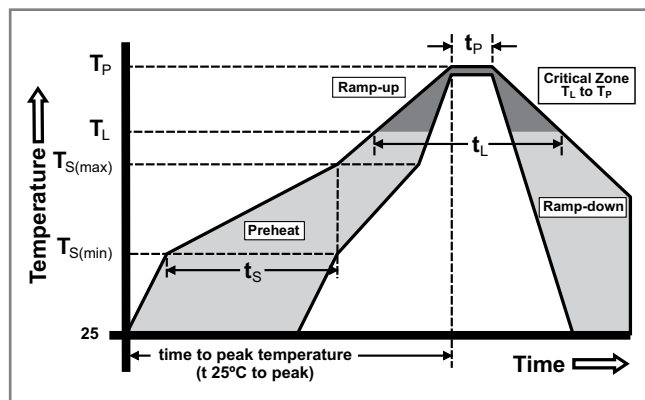
- Derating depicted in this curve is in addition to the standard derating of 25% for continuous operation.

## 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 – 120 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 – 90 seconds
Peak Temperature ( $T_p$ )	250 <sup>+0/-5</sup> °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.	

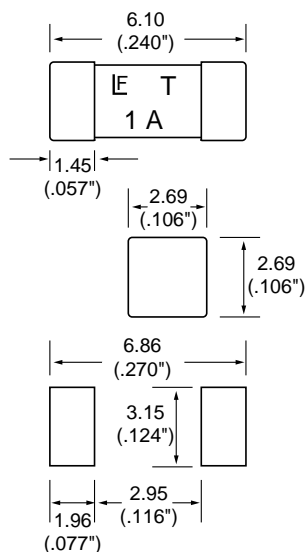


### Product Characteristics

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

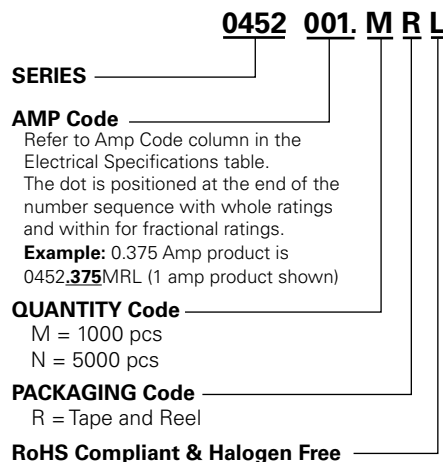
<b>Thermal Shock</b>	MIL-STD-202, Method 107, Test Condition B, 5 cycles, -65°C / +125°C, 15 minutes @ each extreme
<b>Mechanical Shock</b>	MIL-STD-202, Method 213, Test I: Deenergized. 100G's pk amplitude, sawtooth wave 6ms duration, 3 cycles XYZ+xyz = 18 shocks
<b>Vibration</b>	MIL-STD-202, Method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

### Dimensions



Recommended pad layout

### Part Numbering System



**NOTE: "L" suffix applies to 452 series only**

452 series may be ordered as either "RoHS and HF" ("L" suffix) or non-RoHS (no suffix) version.  
 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 RS-481-1 (IEC 286, part 3)	5000	NR
12mm Tape and Reel	EIA RS-481-1 (IEC 286, part 3)	1000	MR