# 452/454 Series Fuse



#### **Agency Approvals**

AGENCY	AGENCY FILE NUMBER AMPERE RAN		
c <b>FL</b> us	E10480	0.375A - 12A	
SP.	29862	0.375A - 12A	
PSE	NBK030205-E10480B	1A - 5A	

### **Electrical Characteristics for Series**

% of Ampere Rating	OpeningTime
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**

## Description

The NANO<sup>2®</sup> Slo-Blo<sup>®</sup> 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

- Small size
- Wide range of current rating available (0.375A to 12A)
  - 375A RoHS o Haloge
- Wide operating temperature range
- Low temperature rerating
   BoHS compliant a
- RoHS compliant and Halogen Free

ROHS HF CPS C RU US SA

## 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

Ampere	Max	Interrupting	Nominal Cold	Nominal	Agency Approvals			
Rating (A)	ating Amp Code Bating Bating		Resistance (Ohms)	Melting I²t (A²sec)	c <b>FL</b> us	() ()		
0.375	.375	125	50A @ 125 VAC/VDC 300A @ 32 VDC PSE: 100A @ 100 VAC	1.2000	0.101	x	х	
0.500	.500	125		0.7000	0.240	x	х	
0.750	.750	125		0.3600	0.904	x	х	
001.	001.	125		0.2250	1.98	x	х	x
1.50	01.5	125		0.0930	3.65	x	х	x
2.00	002.	125		0.0625	8.20	x	х	x
2.50	02.5	125		0.0450	15.0	x	х	x
3.00	003.	125		0.0340	20.16	x	х	x
3.50	03.5	125		0.0224	26.53	x	х	x
4.00	004.	125		0.0186	34.40	x	х	x
5.00	005.	125		0.0136	53.72	x	х	x
7.00	007.	75	50A @ 72 VAC 50A @ 60 VDC 100A @ 75 VDC	0.0105	123.83	x	x	
8	008.	75		0.0088	137.34	x	х	
12	012.	75		0.0061	260.46	x	х	

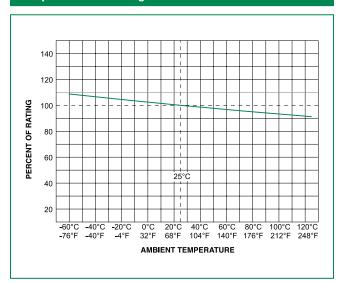
Notes:

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

# **Surface Mount Fuses** NANO<sup>2®</sup> > Slo-Blo<sup>®</sup> Fuse > 452/454 Series



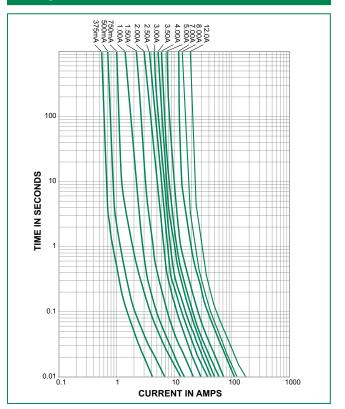
#### **Temperature Re-rating Curve**



Note:

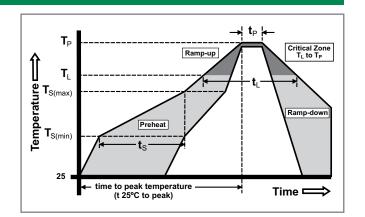
1. Rerating depicted in this curve is in addition to the standard derating of 25% for continuous operation.





#### **Soldering Parameters**

Reflow Condition		Pb – Free assembly	
	-Temperature Min (T <sub>s(min)</sub> )	150°C	
Pre Heat	-Temperature Max (T <sub>s(max)</sub> )	200°C	
	-Time (Min to Max) (t <sub>s</sub> )	60 – 120 secs	
Average ramp up rate (Liquidus Temp $(T_L)$ to peak		5°C/second max.	
T <sub>S(max)</sub> to T <sub>L</sub> - Ramp-up Rate		5°C/second max.	
Reflow	-Temperature (T <sub>L</sub> ) (Liquidus)	217°C	
	-Temperature (t <sub>L</sub> )	60 – 90 seconds	
PeakTemperature (T <sub>P</sub> )		260 <sup>+0/-5</sup> °C	
Time within 5°C of actual peak Temperature (t <sub>p</sub> )		20 – 40 seconds	
Ramp-down Rate		5°C/second max.	
Time 25°C	to peakTemperature (T <sub>P</sub> )	8 minutes max.	
Do not exceed		260°C	
Wave Sold	lering Parameters	260°C Peak Temperature, 3 seconds max.	





# Surface Mount Fuses NANO<sup>2®</sup> > Slo-Blo<sup>®</sup> Fuse > 452/454 Series

#### **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)	
Dimensions		

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)	

0452 001. M R L

#### Part Numbering System

SERIES

AMP Code

#### $2.69 \pm .25$ $6.10 \pm .20$ (.106") (.240") IF Т 2.69 ± .25 (.106") 1 A 1.45 (.057") 6.86 (.270") 3.15 (.124") 2.95 1.96 (.116") (.077")

Recommended pad layout

#### 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

#### 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.<u>375</u>MRL (1 amp product shown) **OUANTITY 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:

454 Series

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.

# Additional InformationDatasheet<br/>452 SeriesPesources<br/>452 SeriesSamples<br/>452 SeriesDatasheetPesources<br/>ResourcesSamples<br/>SamplesDatasheetResourcesSamples<br/>Samples

454 Series

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