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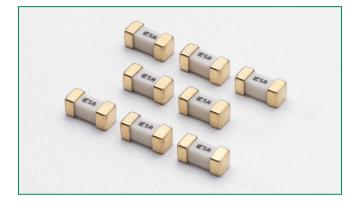
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# 451/453 Series Fuse



Agency Approvals				
AGENCY	AGENCY FILE NUMBER	AMPERE RANGE		
c <b>PL</b> <sup>®</sup> us	E10480	6.3A - 20A		
(Sft)	29862	0.062A - 15A		
PSE	NBK030205-E10480A/B NBK101105-E184655	1A - 5A 6.3A - 10A		
c Uus	E10480	0.062A - 5A		

Electrical Characteristics for Series				
% of Ampere Rating	OpeningTime			
100%	0.062 – 20 4 hours, Minimur			
200%	0.062 – 10	5 sec., Maximum		
	12 – 20	20 sec., Maximum		

# **Additional Information**



Datasheet 451 Series



Datasheet 453 Series

Resources 451 Series



#### Resources 453 Series





Samples 453 Series

# Description

The Nano<sup>2®</sup> SMF Fuse is a very small, Wire-in-Air (WIA) square shape surface mount fuse that was designed for secondary side circuit over-current protection applications. These fuses are designed for PCB using surface mount technology.

# Features

- Very fast-acting
- Small size
- Wide range of current rating available (0.062A to 20A)
- Wide operating temperature range

# Applications

- Notebook PC
- LCD/PDPTV
- LCD monitor
- LCD/PDP panel
- LCD backlight inverter
- Portable DVD player
- Power supply
- Networking
- PC server
- Cooling fan system

• Low temperature rerating

ROHS HF OW US CALUS OF CE

- RoHS compliant and Halogen Free
- Storage system
- Telecom system
- Wireless basestation
- White goods
- Game console
- Office Automation equipment
- Battery charging circuit protection
- Industrial equipment

© 2017 Littelfuse, Inc. Specifications are subject to change without notice. Application testing is strongly recommended. Revised: 06/15/17

Sample: 451 Serie

# **Surface Mount Fuses** $NAN0^{2^{(8)}}$ > Very Fast-Acting Fuse > 451/453 Series



# **Electrical Specifications by Item**

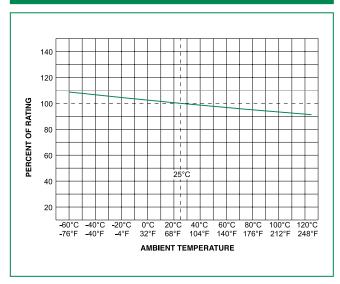
Ampere Max				Nominal Cold	Nominal	Agency Approvals			
Rating (A)	Amp Code	Voltage Rating (V)	Rating	ing Rating Resistance 12	Melting I²t (A²sec)	c 🔊 us	<b>()</b>	PS E	c (ŲL) us
0.062	.062	125		5.5000	0.00019		х		x
0.080	.080	125		4.0500	0.00033		х		x
0.100	.100	125		3.1000	0.00138		х		x
0.125	.125	125		1.7000	0.00286		х		x
0.160	.160	125		1.2157	0.0048		х		x
0.200	.200	125		0.8372	0.0089		х		x
0.250	.250	125		0.5765	0.0158		х	Ì	x
0.315	.315	125	50A @125VAC/VDC	0.3918	0.0311		х		x
0.375	.375	125	300A @32VDC	0.4541	0.0442		х	Ì	x
0.400	.400	125	PSE: 100A @100VAC	0.4233	0.0551		х		x
0.500	.500	125		0.3046	0.0824		х	Ì	x
0.630	.630	125		0.2022	0.1381		х		x
0.750	.750	125		0.1444	0.2143		х		x
0.800	.800	125		0.1355	0.2654		х	1	x
1.00	001.	125		0.0780	0.6029		х	x	x
1.25	1.25	125		0.0780	0.664		х	x	x
1.50	01.5	125		0.0630	0.853		х	x	x
1.60	01.6	125		0.0580	1.060		х	x	x
2.00	002.	125		0.0367	0.530		х	x	x
2.50	02.5	125		0.0286	1.029		х	x	x
3.00	003.	125	50A @125VAC/VDC	0.0227	1.650		х	x	x
3.15	3.15	125	10,000A @75VDC 300A @32VDC	0.0215	1.920		х	x	x
3.50	03.5	125	PSE: 100A @100VAC	0.0200	2.469		х	x	x
4.00	004.	125		0.0160	3.152		х	x	x
5.00	005.	125		0.0125	5.566		х	x	x
6.30	06.3	125	50A @125VAC/VDC	0.0096	9.170	x	х	x	
7.00	007.	125	400A @32VDC	0.0090	10.32	X	х	x	
8.00	008.	125	PSE: 100A @100VAC	0.0077	20.23	x	x	x	
10.0	010.	125	35A @125 VAC/ 50A @125 VDC 400A @32 VDC PSE: 100A @100VAC	0.0056	26.46	x	x	x	
12.0	012.	65	150A @65VDC	0.0049	47.97	x	x		
15.0	015.	65	100A @65VAC	0.0037	97.82	x	х		
20.0	020.	65	400A @32VDC	0.00244	154	x			

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



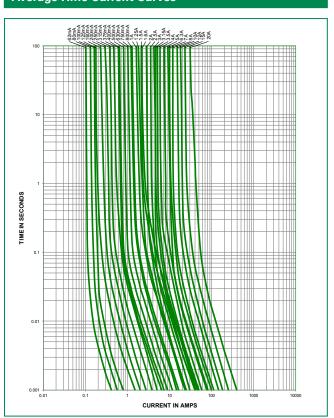
# **Surface Mount Fuses** NANO<sup>2®</sup> > Very Fast-Acting Fuse > 451/453 Series

# **Temperature Re-rating Curve**



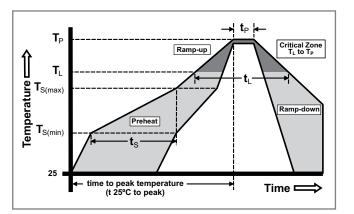
Note:

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



# **Soldering Parameters**

Reflow Co	ndition	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 ra (T <sub>L</sub> ) to pea	amp up rate (LiquidusTemp k	5°C/second max.	
$T_{S(max)}$ to $T_L$	- 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 withi Temperatu	in 5°C of actual peak ıre (t <sub>p</sub> )	20 – 40 seconds	
Ramp-dow	vn Rate	5°C/second max.	
Time 25°C	to peakTemperature (T <sub>P</sub> )	8 minutes max.	
Do not exc	ceed	260°C	
Wave Sold	lering Parameters	260°C Peak Temperature, 10 seconds max.	



# Average Time Current Curves

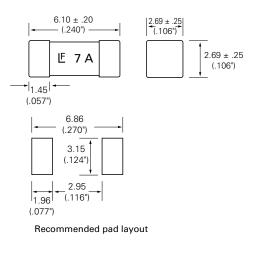


## **Product Characteristics**

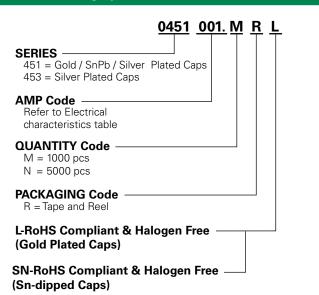
	Body: Ceramic		
	Terminations:		
Materials	Gold-Plated Caps / Sn-dipped Silver Plated Caps (451 RoHS/HF series) SnPb Plated Caps (for 451 Non-RoHS series,		
	375mA-15A)		
	Silver-plated Caps (451MR RoHS ratings below 375mA and 453 RoHS Series)		
Product Marking	Brand, Ampere Rating		
Operating Temperature	–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)		

## **Dimensions**



## Part Numbering System



#### NOTE: "L" suffix applies to 451 series only

- 451 series may be ordered as either "RoHS and HF" ("L" suffix) or non-RoHS (no suffix) version.
- 453 series is available only as RoHS compliant version and does not require "L" suffix. Please do not include "L" suffix within 453 series ordering instructions.

Packaging					
Packaging Option	Packaging Specification	Quantity	Quantity & Packaging Code		
12mm Tape and Reel	EIA RS-481-2 (IEC 286, part 3)	5000	NR		
12mm Tape and Reel	EIA RS-481-2 (IEC 286, part 3)	1000	MR		

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