





451/453 Series Fuse







Description

The Nano²® 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.

Agency Approvals

Agency	Agency File Number	Ampere Range
	E10480	6.3A - 20A
	29862	0.062A - 15A
	J50446731	1A, 1.25A, 2A, 2.5A, 3.15A, 4A, 5A, 7A, 8A, 10A, 12A, 20A
	NBK030205-E10480A NBK030205-E10480B NBK101105-E184655	1A-1.6A 2A-5A 6.3A - 10A

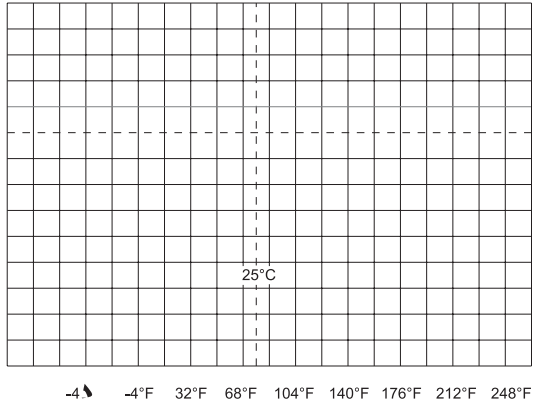
Electrical Specifications by Item

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					
											
.062	.062	125	50A @125VAC/VDC 300A @32VDC PSE: 100A @100VAC	5.5000	0.00019	-	x	-	x	-	-
.080	.080	125		4.0500	0.00033	-	x	-	x	-	-
.100	.100	125		3.1000	0.00138	-	x	-	x	-	-
.125	.125	125		1.7000	0.00286	-	x	-	x	-	-
.160	.160	125		1.2157	0.0048	-	x	-	x	-	-
.200	.200	125		0.8372	0.0089	-	x	-	x	-	-
.250	.250	125		0.5765	0.0158	-	x	-	x	-	-
.315	.315	125		0.3918	0.0311	-	x	-	x	-	-
.375	.375	125		0.4541	0.0442	-	x	-	x	-	-
.400	.400	125		0.4233	0.0551	-	x	-	x	-	-
.500	.500	125		0.3046	0.0824	-	x	-	x	-	-
.630	.630	125		0.2022	0.1381	-	x	-	x	-	-
.750	.750	125		0.1444	0.2143	-	x	-	x	-	-
.800	.800	125		0.1355	0.2654	-	x	-	x	-	-
1.00	001.	125		0.0780	0.6029	-	x	x	x	x	x
1.25	1.25	125		0.0780	0.664	-	x	x	x	x	x
1.50	01.5	125		0.0630	0.853	-	x	x	x	-	-
1.60	01.6	125		0.0580	1.060	-	x	x	x	-	-
2.00	002.	125	50A @125VAC/VDC 10,000A @75VDC 300A @32VDC PSE: 100A @100VAC	0.0367	0.530	-	x	x	x	x	x
2.50	02.5	125		0.0286	1.029	-	x	x	x	x	x
3.00	003.	125		0.0227	1.650	-	x	x	x	-	-
3.15	3.15	125		0.0215	1.920	-	x	x	x	x	x
3.50	03.5	125		0.0200	2.469	-	x	x	x	-	-
4.00	004.	125		0.0160	3.152	-	x	x	x	x	x
5.00	005.	125		0.0125	5.566	-	x	x	x	x	x
6.30	06.3	125	50A @125VAC/VDC 400A @32VDC PSE: 100A @100VAC	0.0096	9.170	x	x	x	-	-	-
7.00	007.	125		0.0090	10.32	x	x	x	-	x	x
8.00	008.	125		0.0077	20.23	x	x	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	-	x	x
12.0	012.	65	150A @65VDC 100A @65VAC 400A @32VDC	0.0049	47.97	x	x	-	-	x	x
15.0	015.	65		0.0037	97.82	x	x	-	-	-	-
20.0	020.	65		0.00244	154	x	-	-	-	x	x

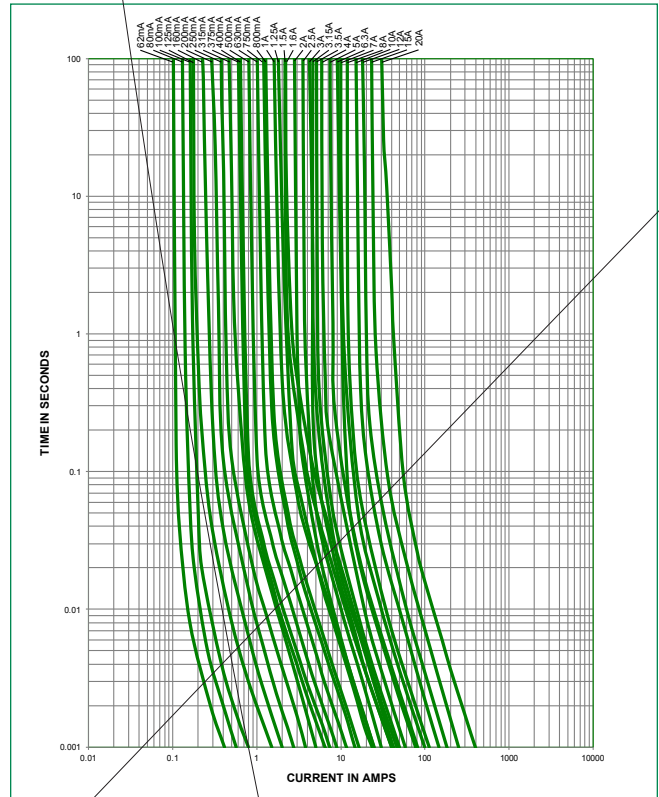
Notes:

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

Temperature Re-rating Curve



Average Time Current Curves



Soldering Parameters

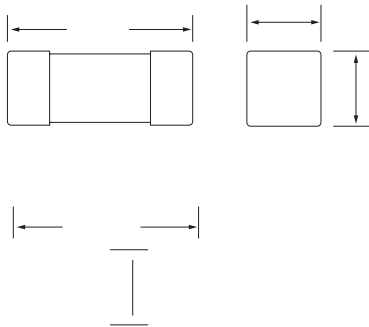
Reflow Condition		Pb – Free assembly
Pre Heat	- Temperature Min ($T_{s(min)}$)	150°C
	- Temperature Max ($T_{s(max)}$)	200°C
	- Time (Min to Max) (t_s)	60 – 180 secs
Average ramp up rate (Liquidus Temp (T_L) to peak		5°C/second max.
$T_{s(max)}$ to T_L - Ramp-up Rate		5°C/second max.
Reflow	- Temperature (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

Product Characteristics

Materials	Body: Ceramic Terminations: Gold-Plated Caps / Sn-dipped Silver Plated Caps (451 RoHS/HF series) 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

Packaging

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Littelfuse:

[R451002](#) [R451.250L](#) [04531.25](#) [0451012.MRL](#) [0451.062MR](#) [0451.630MR](#) [0453.400MR](#) [0451.500NR](#) [451.500R](#)
[045301.6MR](#) [0451.400MRL](#) [0451.160MR](#) [0453008.MR](#) [0451004.NR](#) [0451.200MRL](#) [0451.800MR](#) [0453.375MR](#)
[0453001.MR](#) [0451004.MR](#) [0453005.MR](#) [0451.315MR](#) [0451.160MRL](#) [0451010.MRL](#) [0453002.MR](#) [0451.100MRL](#)
[045103.5NR](#) [0451.375MR](#) [0451004.MRL](#) [0451.125MR](#) [045101.6MRL](#) [0453.800MR](#) [0451.750MRL](#) [045102.5NR](#)
[0451.062MRL](#) [0451.375NR](#) [04513.15MRL](#) [0451003.NR](#) [045302.5MR](#) [045306.3MR](#) [0451005.MR](#) [0451015.MR](#)
[0453.750MR](#) [04511.25MR](#) [04513.15MR](#) [045102.5MR](#) [0451.080MR](#) [045101.6MR](#) [045106.3MR](#) [0451.375MRL](#)
[0451.250NR](#) [0451003.MR](#) [R451.080L](#) [0451012.NR](#) [0451.125MRL](#) [0451001.MR](#) [0451.315MRL](#) [0451001.NR](#)
[453007.](#) [0451.500MR](#) [0453001.](#) [0453002.](#) [0453003.](#) [0453004.](#) [0453005.](#) [0453007.](#) [0453008.](#) [0453010.](#) [0453015.](#)
[045302.5](#) [045306.3](#) [R451.125L](#) [R451.750L](#) [R451.800L](#) [0453.630](#) [0453.062MR](#) [0453.080MR](#) [0453.100MR](#)
[0453.125MR](#) [R45101.5L](#) [R45106.3L](#) [R45102.5L](#) [R4513.15L](#) [R451008.L](#) [R45103.5L](#) [R451.080](#) [R451.100L](#)
[R4511.25L](#) [0453010.MR](#) [045103.5MR](#) [0451007.MR](#) [0451008.MRL](#) [0451005.MRL](#) [0451001.MRL](#) [0451.500MRL](#)
[0451.750MR](#) [0451015.MRL](#) [0453015.MR](#) [045101.5NR](#) [045103.5MRL](#) [04531.25MR](#)