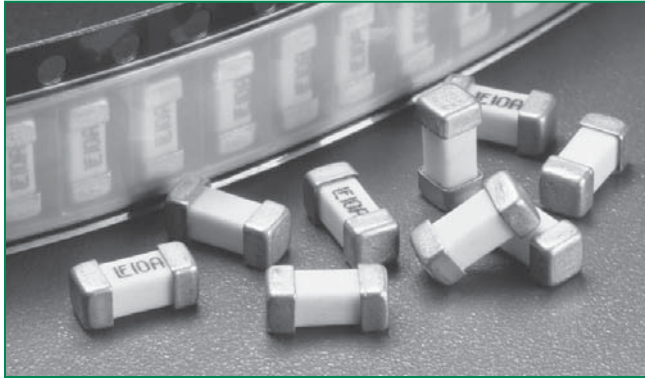


RoHS  **448 Series Fuse**






Description

The lead-free Nano² SMF Fuse is a very small, square surface mount fuse that is RoHS compliant and 100% lead-free. This product is fully compatible with lead-free solder alloys and higher temperature profiles associated with lead-free assembly.

Features

- Lead-free
- Very fast acting
- Small size
- Wide range of current rating available (62mA to 15A)
- Wide operating temperature range
- Low temperature de-rating

Agency Approvals

Agency	Agency File Number	Ampere Range
	E10480	62mA - 15A
	LR29862	62mA - 15A
	NBK030205	1A - 10A




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

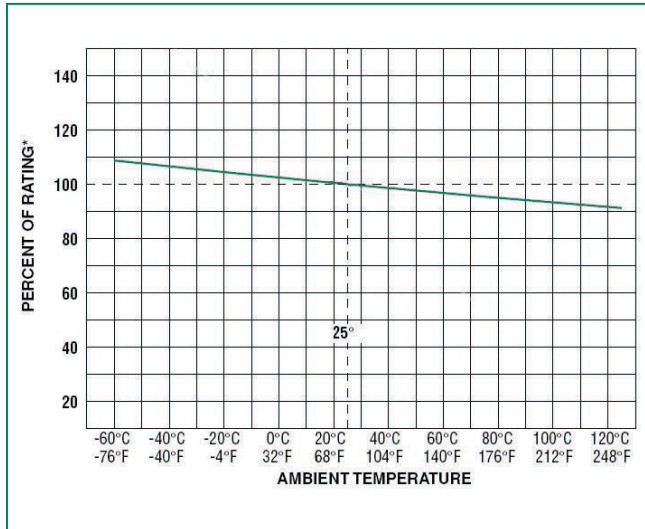
Electrical Characteristics for Series

% of Ampere Rating	Ampere Rating	Opening Time
100%	1/16 – 15	4 hours, Minimum
200%	1/16 – 10	5 sec., Maximum
	12 – 15	20 sec., Maximum

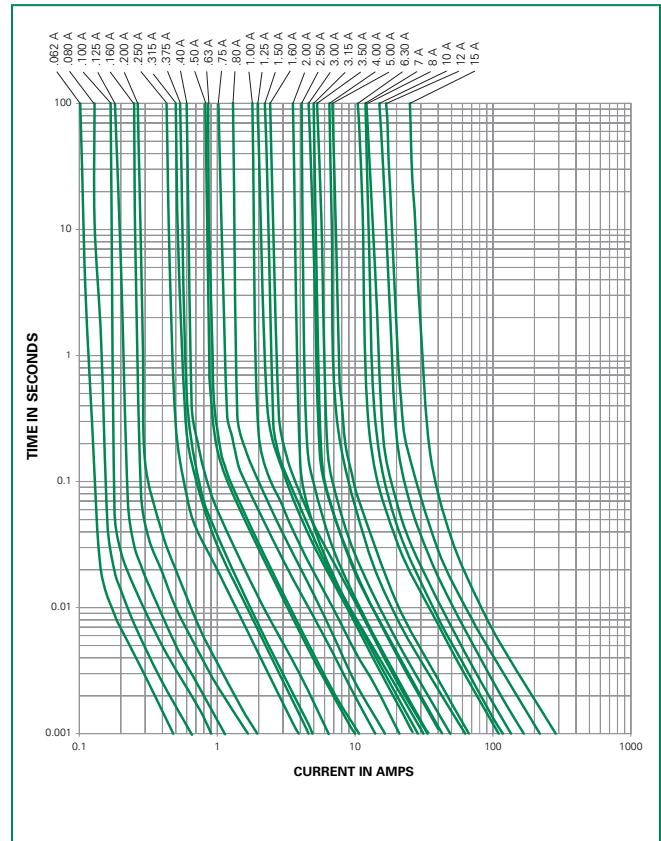
Electrical Specifications by Item

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		
								
0.062	.062	125	50 amperes @125 VAC/VDC 300 amperes @32 VDC	5.50	0.00023	x	x	
0.080	.080	125		4.42	0.00043	x	x	
0.100	.100	125		2.90	0.00082	x	x	
0.125	.125	125		2.58	0.00130	x	x	
0.160	.160	125		1.76	0.00280	x	x	
0.200	.200	125		1.40	0.00380	x	x	
0.250	.250	125		1.05	0.01520	x	x	
0.315	.315	125		0.7900	0.02650	x	x	
0.375	.375	125		0.7300	0.02400	x	x	
0.400	.400	125		0.4895	0.04160	x	x	
0.500	.500	125		0.3800	0.10000	x	x	
0.630	.630	125		0.2821	0.121	x	x	
0.750	.750	125		0.2475	0.206	x	x	
0.800	.800	125		0.1907	0.272	x	x	
1.00	001.	125		0.08630	0.441	x	x	x
1.25	1.25	125		0.06619	0.900	x	x	x
1.50	01.5	125		0.06514	0.900	x	x	x
1.60	01.6	125		0.06261	1.122	x	x	x
2.00	002.	125		0.03529	0.812	x	x	x
2.50	02.5	125		0.02934	1.156	x	x	x
3.00	003.	125		0.02445	1.720	x	x	x
3.15	3.15	125		0.02300	1.810	x	x	x
3.50	03.5	125		0.02100	2.300	x	x	x
4.00	004.	125		0.01577	3.970	x	x	x
5.00	005.	125		0.01531	4.490	x	x	x
6.30	06.3	125		0.01044	12.10	x	x	x
7.00	007.	125		0.00900	13.92	x	x	x
8.00	008.	125		0.00780	18.33	x	x	x
10.00	010.	125	35 amperes @125 VAC/50 amperes @125 VDC 300 amperes @32 VDC	0.00700	28.00	x	x	x
12.00	012.	65	50 amperes @65 VAC/VDC 300 amperes @24 VDC	0.00533	47.59	x	x	
15.00	015.	65		0.00394	96.10	x	x	

Temperature Derating Curve

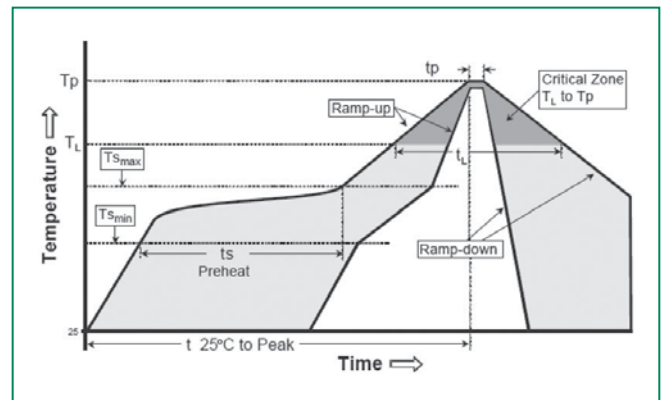


Average Time Current Curves



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)		250 ^{+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

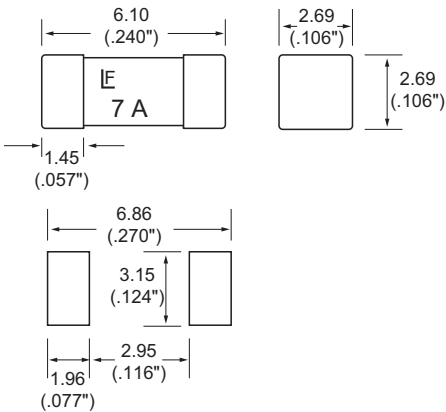


Product Characteristics

Materials	Body: Ceramic Terminations: Gold-plated Caps
Product Marking	Brand, Amperage Rating
Operating Temperature	-55°C to 125°C
Moisture Sensitivity Level	Level 2, J-STD-020C
Solderability	MIL-STD-202, Method 208
Insulation Resistance (after Opening)	MIL-STD-202, Method 302, Test Condition A (10,000 ohms minimum)

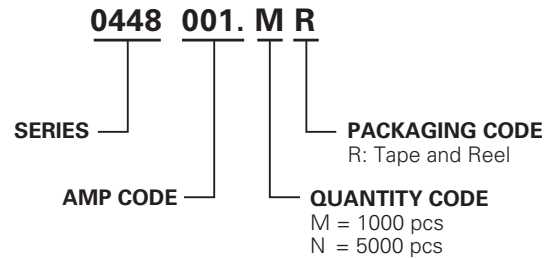
Thermal Shock	MIL-STD-202, Method 107, Test Condition B, 5 cycles, -65°C to 125°C, 15 minutes @ each extreme
Mechanical Shock	MIL-STD-202, Method 213, Test I: Deenergized. 100gn pk amplitude, sawtooth wave 6ms duration, 3 cycles XYZ+xyz = 18 shocks
Vibration	MIL-STD-202, Method 201: 0.03" amplitude, 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



Recommended pad layout

Part Numbering System



Packaging

Packaging Option	Packaging Specification	Quantity	Quantity & Packaging Code
12mm Tape and Reel	EIA RS-481-1 (IEC 286, part 3)	1000	MR