


Features

- 100 % electrically compatible with all previous generations of 1812 SMT devices
- Compatible with Pb and Pb-free solder reflow profiles
- RoHS compliant* and halogen free**
- Surface mount packaging for automated assembly
- Agency recognition: 
- Standard 4532 mm (1812 mils) footprint

MF-MSMF L Series - PTC Resettable Fuses

Electrical Characteristics

Model	V max. Volts	I max. Amps	I _{hold}	I _{trip}	Resistance		Max. Time To Trip		Tripped Power Dissipation
			Amperes at 23 °C		Ohms at 23 °C		Amperes at 23 °C	Seconds at 23 °C	Watts at 23 °C
			Hold	Trip	R _{Min.}	R _{1Max.}			Typ.
MF-MSMF110L	6.0	100	1.10	2.20	0.04	0.21	8.0	0.30	0.8
MF-MSMF150L	6.0	100	1.50	3.00	0.03	0.120	8.0	0.5	0.8
MF-MSMF160L	8.0	100	1.60	2.80	0.035	0.099	8.0	2.0	0.8
MF-MSMF200L	8.0	40	2.00	4.00	0.020	0.080	8.0	3.0	0.8
MF-MSMF260L	6.0	100	2.60	5.20	0.015	0.080	8.0	5.0	0.8

Environmental Characteristics

Operating Temperature.....	-40 °C to +85 °C
Maximum Device Surface Temperature in Tripped State	125 °C
Passive Aging	+85 °C, 1000 hours..... ±5 % typical resistance change
Humidity Aging	+85 °C, 85 % R.H. 1000 hours..... ±5 % typical resistance change
Thermal Shock	+85 °C to -40 °C, 20 times..... ±10 % typical resistance change
Solvent Resistance.....	MIL-STD-202, Method 215..... No change
Vibration	MIL-STD-883C, Method 2007.1,..... No change Condition A

Test Procedures And Requirements For Model MF-MSMF L Series

Test	Test Conditions	Accept/Reject Criteria
Visual/Mech.....	Verify dimensions and materials.....	Per MF physical description
Resistance.....	In still air @ 23 °C.....	R _{min} ≤ R ≤ R _{1max}
Time to Trip.....	At specified current, V _{max} , 23 °C.....	T ≤ max. time to trip (seconds)
Hold Current.....	30 min. at I _{hold}	No trip
Trip Cycle Life.....	V _{max} , I _{max} , 100 cycles.....	No arcing or burning
Trip Endurance.....	V _{max} , 48 hours.....	No arcing or burning
Solderability.....	ANSI/J-STD-002.....	95 % min. coverage

UL File Number E174545
<http://www.ul.com/> Follow link to Certifications, then UL File No., enter E174545

BOURNS®

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*RoHS Directive 2002/95/EC Jan 27 2003 including Annex.
 **Bourns is using the definition that appears to be the prevalent definition used as the industry standard at this time. The Bourns definition of "halogen-free" is:
 Bromine (Br) content: ≤ 900 ppm; Chlorine (Cl) content: ≤ 900 ppm; Total Br + Cl content: ≤ 1500 ppm.
 Specifications are subject to change without notice.
 Customers should verify actual device performance in their specific applications.

Applications

- Overcurrent and overtemperature protection of automotive electronics
- Hard disk drives
- PC motherboards
- PC peripherals
- Point-of-sale (POS) equipment
- PCMCIA cards
- USB port protection - USB 2.0, 3.0 & OTG
- HDMI 1.4 Source protection

MF-MSMF L Series - PTC Resettable Fuses

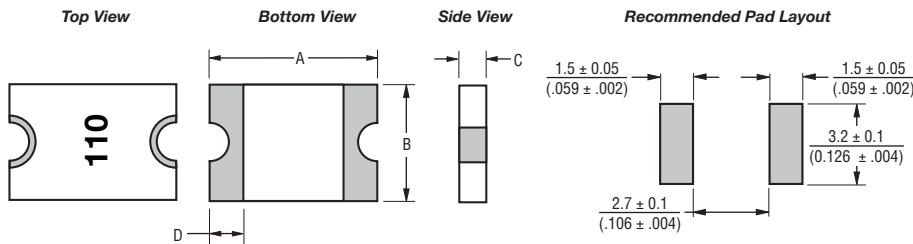
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Product Dimensions

Model	A		B		C		D
	Min.	Max.	Min.	Max.	Min.	Max.	Min.
MF-MSMF110L	$\frac{4.37}{(0.172)}$	$\frac{4.73}{(0.186)}$	$\frac{3.07}{(0.121)}$	$\frac{3.41}{(0.134)}$	$\frac{0.45}{(0.018)}$	$\frac{0.85}{(0.033)}$	$\frac{0.30}{(0.012)}$
MF-MSMF150L	$\frac{4.37}{(0.172)}$	$\frac{4.73}{(0.186)}$	$\frac{3.07}{(0.121)}$	$\frac{3.41}{(0.134)}$	$\frac{0.55}{(0.015)}$	$\frac{0.85}{(0.033)}$	$\frac{0.30}{(0.012)}$
MF-MSMF160L	$\frac{4.37}{(0.172)}$	$\frac{4.73}{(0.186)}$	$\frac{3.07}{(0.121)}$	$\frac{3.41}{(0.134)}$	$\frac{0.55}{(0.015)}$	$\frac{0.85}{(0.033)}$	$\frac{0.30}{(0.012)}$
MF-MSMF200L	$\frac{4.37}{(0.172)}$	$\frac{4.73}{(0.186)}$	$\frac{3.07}{(0.121)}$	$\frac{3.41}{(0.134)}$	$\frac{0.45}{(0.018)}$	$\frac{0.85}{(0.033)}$	$\frac{0.30}{(0.012)}$
MF-MSMF260L	$\frac{4.37}{(0.172)}$	$\frac{4.73}{(0.186)}$	$\frac{3.07}{(0.121)}$	$\frac{3.41}{(0.134)}$	$\frac{0.48}{(0.019)}$	$\frac{0.85}{(0.033)}$	$\frac{0.30}{(0.012)}$

Packaging: 2000 pcs. per reel.

DIMENSIONS: $\frac{\text{MM}}{\text{(INCHES)}}$



Terminal material:

Electroless Ni under immersion Au

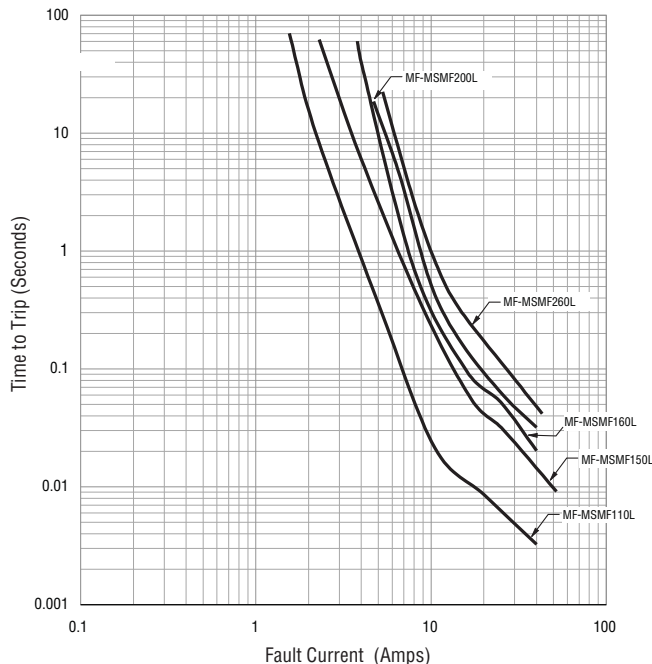
Termination pad solderability:

Standard Au finish:
Meets ANSI/J-STD-002 Category 2.

Recommended Storage:

40 °C max./70 % RH max.

Typical Time to Trip at 23 °C



The Time to Trip curves represent typical performance of a device in a simulated application environment. Actual performance in specific customer applications may differ from these values due to the influence of other variables.

Specifications are subject to change without notice.
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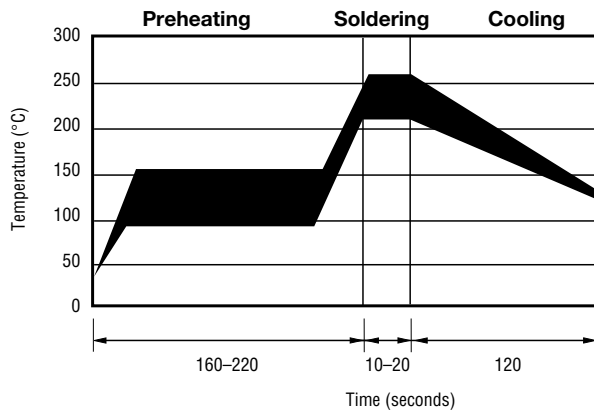
MF-MSMF L Series - PTC Resettable Fuses

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Thermal Derating Chart - I_{hold} (Amps)

Model	Ambient Operating Temperature								
	-40 °C	-20 °C	0 °C	23 °C	40 °C	50 °C	60 °C	70 °C	85 °C
MF-MSMF110L	1.59	1.43	1.26	1.10	0.95	0.87	0.80	0.71	0.60
MF-MSMF150L	2.17	1.95	1.72	1.50	1.30	1.18	1.09	0.97	0.82
MF-MSMF160L	2.30	2.20	1.90	1.60	1.45	1.30	1.15	1.03	0.91
MF-MSMF200L	3.08	2.71	2.35	2.00	1.80	1.60	1.50	1.40	1.25
MF-MSMF260L	4.00	3.52	3.06	2.60	2.34	2.08	1.95	1.39	1.04

Solder Reflow Recommendations



Notes:

- MF-MSMF models cannot be wave soldered. Please contact Bourns for hand soldering recommendations.
- If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.
- Compatible with Pb and Pb-free solder reflow profiles.
- Excess solder may cause a short circuit, especially during hand soldering. Please refer to the Multifuse® Polymer PTC Soldering Recommendation guidelines.

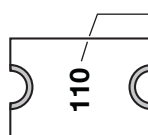
How to Order

MF - MSMF 110 L - 2

Multifuse® Product Designator _____
 Series _____
 MSMF = 4532 mm (1812 mils) Surface Mount Component
 Hold Current, I_{hold} _____
 110-260 (1.10 Amps - 2.60 Amps)
 Model Suffix _____
 Packaging _____
 Packaged per EIA 481-1
 -2 = Tape and Reel

Typical Part Marking

Represents total content. Layout may vary.



PART IDENTIFICATION EXAMPLES:

MF-MSMF110L = 110
 MF-MSMF150L = 150
 MF-MSMF160L = 160
 MF-MSMF200L = 200
 MF-MSMF260L = 260

MF-MSMF L SERIES, REV. A, 01/11

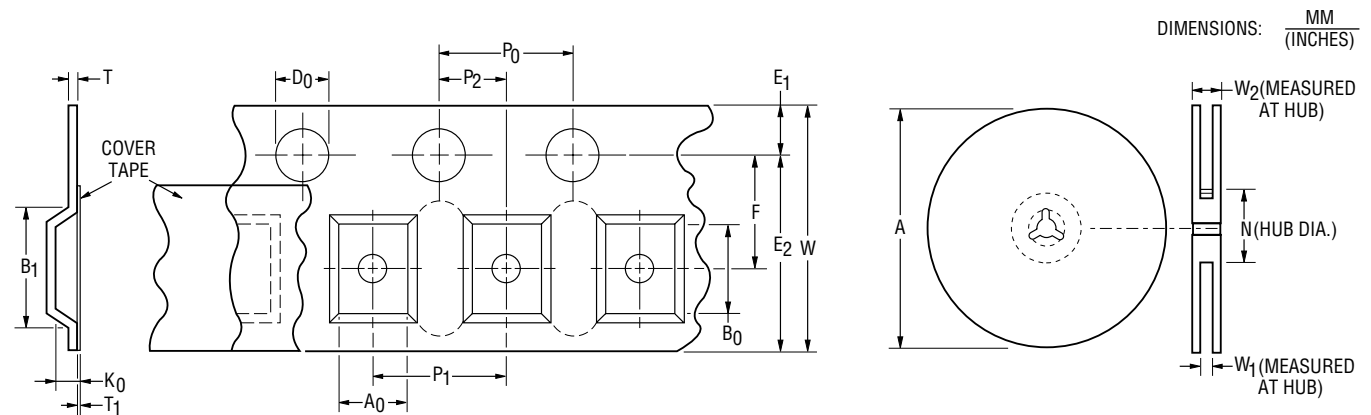
“freeXpansion Design” is a trademark of Bourns, Inc.
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MF-MSMF L Series Tape and Reel Specifications

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Tape Dimensions	MF-MSMF L Series per EIA 481-1
W	12.0 ± 0.30 (0.472 ± 0.012)
P ₀	4.0 ± 0.10 (0.157 ± 0.004)
P ₁	8.0 ± 0.10 (0.315 ± 0.004)
P ₂	2.0 ± 0.05 (0.079 ± 0.002)
A ₀	3.66 ± 0.15 (0.144 ± 0.006)
B ₀	4.98 ± 0.10 (0.196 ± 0.004)
B ₁ max.	5.9 (0.232)
D ₀	$1.5 + 0.10/-0.0$ (0.059 + 0.004/-0)
F	5.5 ± 0.05 (0.217 ± 0.002)
E ₁	1.75 ± 0.10 (0.069 ± 0.004)
E ₂ min.	10.25 (0.404)
T max.	0.6 (0.024)
T ₁ max.	0.1 (0.004)
K ₀	0.95 ± 0.10 (0.037 ± 0.004)
Leader min.	390 (15.35)
Trailer min.	160 (6.30)
Reel Dimensions	
A max.	185 (7.28)
N min.	50 (1.97)
W ₁	$12.4 + 2.0/-0.0$ (0.488 + 0.079/-0.0)
W ₂ max.	18.4 (0.724)



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