





Features

- High power ratings
- Compliant with AEC-Q200 Rev-C- Stress Test Qualification for Passive Components in Automotive Applications
- Low profile
- Compatible with Pb and Pb-free solder reflow profiles
- RoHS compliant* and halogen free**
- Surface mount packaging for automated assembly
- Agency recognition:  
- Standard 7555 mm (2920 mils) footprint

MF-LSMF 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-LSMF185/33X | 33.0 | 40 | 1.85 | 3.70 | 0.045 | 0.150 | 8.0 | 2.50 | 1.5 | | |
| MF-LSMF260X | 24.0 | 20 | 2.60 | 5.20 | 0.020 | 0.075 | 8.0 | 5.00 | 1.5 | | |
| MF-LSMF300X | 6.0 | 40 | 3.00 | 5.00 | 0.015 | 0.048 | 8.0 | 20.00 | 1.5 | | |
| MF-LSMF300/24X | 24.0 | 20 | 3.00 | 5.20 | 0.020 | 0.075 | 8.0 | 5.00 | 1.5 | | |

*** Features Multifuse® Free Xpansion Design™ for MF-LSMF Series.

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-LSMF 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

TÜV Certificate Number R 50256634
<http://www.tuvdotcom.com/> Follow link to "Certificate Search", enter 50256634

*RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011.

**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.

The device characteristics and parameters in this data sheet can and do vary in different applications and actual device performance may vary over time. Users should verify actual device performance in their specific applications.

Applications

- Automotive electronics
- Industrial controls
- IEEE ports
- Portable electronics

MF-LSMF Series - PTC Resettable Fuses

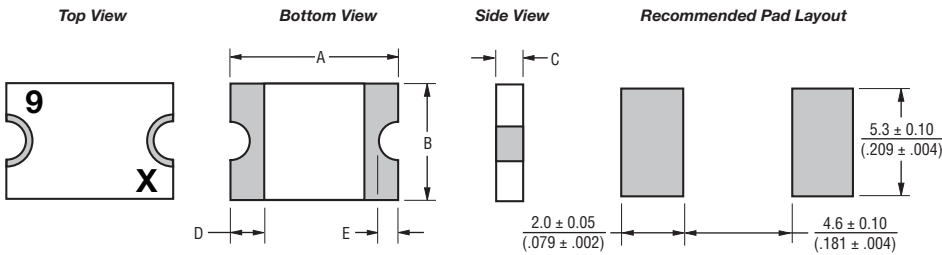
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Product Dimensions

| Model | A | | B | | C | | D | | E | |
|----------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|--|
| | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Min. | Max. | |
| MF-LSMF185/33X | $\frac{6.73}{(0.265)}$ | $\frac{7.98}{(0.312)}$ | $\frac{4.80}{(0.189)}$ | $\frac{5.44}{(0.214)}$ | $\frac{0.75}{(0.030)}$ | $\frac{1.60}{(0.063)}$ | $\frac{0.30}{(0.012)}$ | $\frac{0.25}{(0.010)}$ | $\frac{2.00}{(0.079)}$ | |
| MF-LSMF260X | $\frac{6.73}{(0.265)}$ | $\frac{7.98}{(0.312)}$ | $\frac{4.80}{(0.189)}$ | $\frac{5.44}{(0.214)}$ | $\frac{0.75}{(0.030)}$ | $\frac{1.60}{(0.063)}$ | $\frac{0.30}{(0.012)}$ | $\frac{0.25}{(0.010)}$ | $\frac{2.00}{(0.079)}$ | |
| MF-LSMF300X | $\frac{6.73}{(0.265)}$ | $\frac{7.98}{(0.312)}$ | $\frac{4.80}{(0.189)}$ | $\frac{5.44}{(0.214)}$ | $\frac{0.35}{(0.014)}$ | $\frac{0.85}{(0.033)}$ | $\frac{0.30}{(0.012)}$ | $\frac{0.25}{(0.010)}$ | $\frac{2.00}{(0.079)}$ | |
| MF-LSMF300/24X | $\frac{6.73}{(0.265)}$ | $\frac{7.98}{(0.312)}$ | $\frac{4.80}{(0.189)}$ | $\frac{5.44}{(0.214)}$ | $\frac{0.75}{(0.030)}$ | $\frac{1.60}{(0.063)}$ | $\frac{0.30}{(0.012)}$ | $\frac{0.25}{(0.010)}$ | $\frac{2.00}{(0.079)}$ | |

Packaging: 3000 pcs. per reel.

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



Terminal material:

Electroless Ni under immersion Au

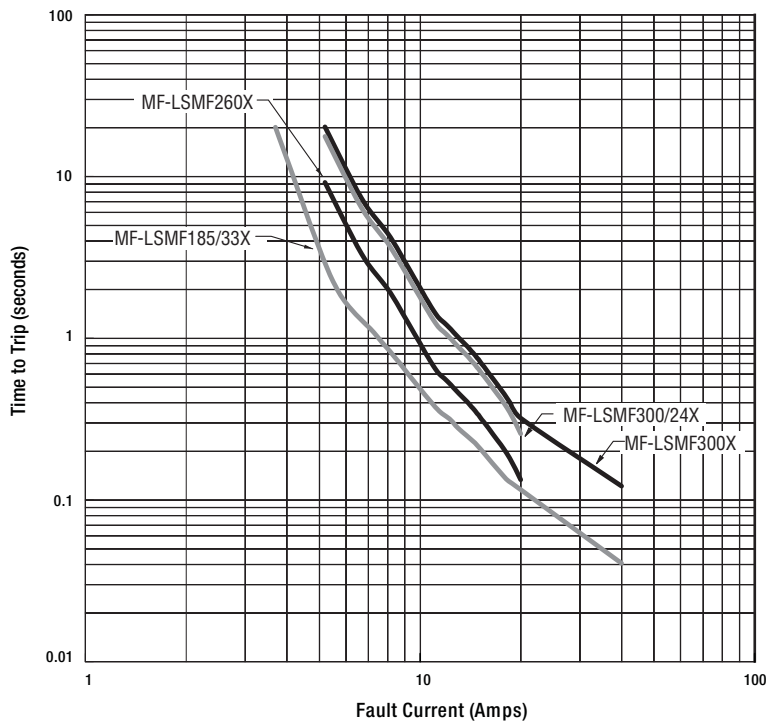
Termination pad solderability:

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.

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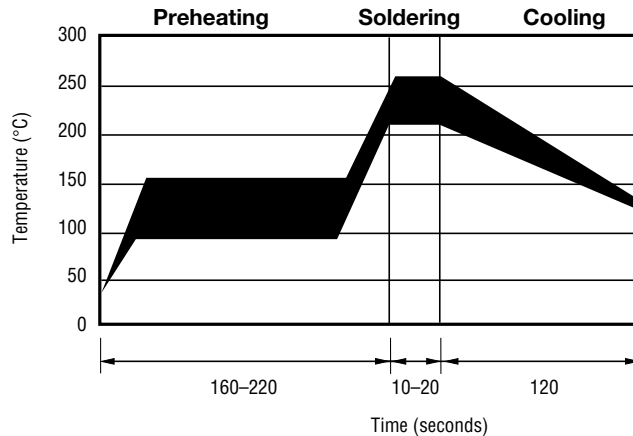
MF-LSMF Series - PTC Resettable Fuses

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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-LSMF185/33X | 2.80 | 2.47 | 2.17 | 1.85 | 1.54 | 1.39 | 1.22 | 1.07 | 0.85 |
| MF-LSMF260X | 3.75 | 3.35 | 3.00 | 2.60 | 2.35 | 2.15 | 2.05 | 1.80 | 1.30 |
| MF-LSMF300X | 4.53 | 4.02 | 3.51 | 3.00 | 2.52 | 2.26 | 1.99 | 1.75 | 1.34 |
| MF-LSMF300/24X | 4.00 | 3.55 | 3.20 | 3.00 | 2.50 | 2.25 | 2.15 | 1.85 | 1.50 |

Solder Reflow Recommendations



Notes:

- MF-LSMF 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.

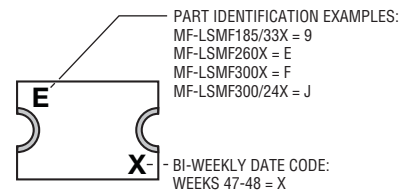
How to Order

MF - LSMF 185/33X - 2

Multifuse® Product Designator _____
 Series _____
 LSMF = 7555 mm (2920 mils) Surface Mount Component
 Hold Current, I_{hold} _____
 185-300 (1.85 Amps - 3.00 Amps)
 Higher Voltage Option _____
 /24 = 24 Volt Rated
 /33 = 33 Volt Rated
 X = Multifuse® freeXpansion™ Design MF-LSMF Series
 Packaging _____
 Packaged per EIA 481-1
 -2 = Tape and Reel

Typical Part Marking

Represents total content. Layout may vary.



MF-LSMF SERIES, REV. B, 07/13

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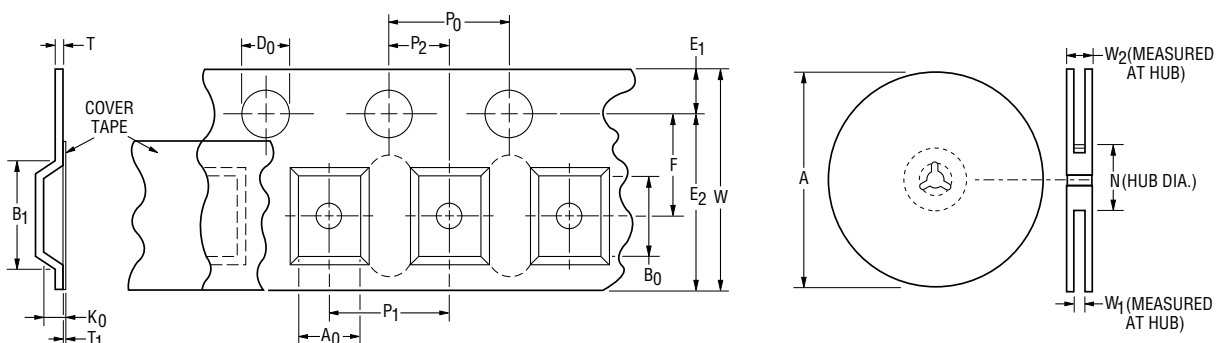
MF-LSMF Series Tape and Reel Specifications

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NOTE: Effective December 1, 2010 (product date code "X"), the cover tape was changed to the new 3M™ Universal Cover Tape (UCT).

| Tape Dimensions | MF-LSMF300X | MF-LSMF185/33X, MF-LSMF260X, MF-LSMF300/24X |
|------------------------|---|--|
| | per EIA 481-2 | per EIA 481-2 |
| W | 16.0 ± 0.30 (0.630 ± 0.012) | 16.0 ± 0.30 (0.630 ± 0.012) |
| P ₀ | 4.0 ± 0.10 (0.157 ± 0.004) | 4.0 ± 0.10 (0.157 ± 0.004) |
| P ₁ | 8.0 ± 0.10 (0.315 ± 0.004) | 8.0 ± 0.10 (0.315 ± 0.004) |
| P ₂ | 2.0 ± 0.05 (0.079 ± 0.002) | 2.0 ± 0.05 (0.079 ± 0.002) |
| A ₀ | 5.74 ± 0.10 (0.226 ± 0.004) | 5.70 ± 0.10 (0.224 ± 0.004) |
| B ₀ | 8.02 ± 0.10 (0.316 ± 0.004) | 8.10 ± 0.10 (0.319 ± 0.004) |
| B ₁ max. | 12.1 (0.476) | 12.1 (0.476) |
| D ₀ | $1.5 + 0.10/-0.0$ (0.059 + 0.004/-0) | $1.5 + 0.10/-0.0$ (0.059 + 0.004/-0) |
| F | 7.5 ± 0.05 (0.295 ± 0.002) | 7.5 ± 0.05 (0.295 ± 0.002) |
| E ₁ | 1.75 ± 0.10 (0.069 ± 0.004) | 1.75 ± 0.10 (0.069 ± 0.004) |
| E ₂ min. | 14.25 (0.561) | 14.25 (0.561) |
| T max. | 0.6 (0.024) | 0.6 (0.024) |
| T ₁ max. | 0.1 (0.004) | 0.1 (0.004) |
| K ₀ | 0.91 ± 0.10 (0.036 ± 0.004) | 1.70 ± 0.10 (0.067 ± 0.004) |
| Leader min. | 390 (15.35) | 390 (15.35) |
| Trailer min. | 160 (6.30) | 160 (6.30) |
| Reel Dimensions | | |
| A max. | 331 (13.03) | 331 (13.03) |
| N min. | 50 (1.97) | 50 (1.97) |
| W ₁ | $16.4 + 2.0/-0.0$ (0.646 + 0.079/-0.0) | $16.4 + 2.0/-0.0$ (0.646 + 0.079/-0.0) |
| W ₂ max. | 22.4 (0.882) | 22.4 (0.882) |

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



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