



Features

- Compact design to save board space - 0805 footprint
- Small size results in very fast time to react to fault events
- Symmetrical design
- Low profile
- RoHS compliant* and halogen free**
- Agency recognition: 

Applications

- USB port protection - USB 2.0, 3.0 & OTG
- HDMI 1.4 Source protection
- PC motherboards - Plug and Play protection
- Mobile phones - Battery and port protection
- PDAs / digital cameras
- Game console port protection

MF-PSMF 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-PSMF010X | 15 | 40 | 0.10 | 0.30 | 1.0 | 7.5 | 0.5 | 1.5 | 0.5 |
| MF-PSMF010/24X*** | 24 | 80 | 0.10 | 0.30 | 1.0 | 7.5 | 0.5 | 1.5 | 0.5 |
| MF-PSMF020X | 9 | 40 | 0.20 | 0.50 | 0.65 | 3.5 | 8.00 | 0.02 | 0.5 |
| MF-PSMF035X | 6 | 40 | 0.35 | 0.75 | 0.250 | 1.200 | 8.00 | 0.10 | 0.5 |
| MF-PSMF050X | 6 | 40 | 0.50 | 1.00 | 0.150 | 0.900 | 8.00 | 0.10 | 0.5 |
| MF-PSMF075X | 6 | 40 | 0.75 | 1.50 | 0.090 | 0.350 | 8.00 | 0.20 | 0.6 |
| MF-PSMF110X | 6 | 40 | 1.10 | 2.20 | 0.060 | 0.210 | 8.00 | 0.30 | 0.6 |

***TÜV approval pending.

Environmental Characteristics

| | | |
|----------------------------|-----------------------------------|---------------------------------|
| Operating Temperature..... | -40 °C to +85 °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-PSMF 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 50171531

<http://www.tuvdotcom.com/> Follow link to "other certificates", enter File No. 50171531

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-PSMF010X | 0.15 | 0.13 | 0.12 | 0.10 | 0.09 | 0.08 | 0.07 | 0.06 | 0.05 |
| MF-PSMF010/24X | 0.15 | 0.13 | 0.12 | 0.10 | 0.09 | 0.08 | 0.07 | 0.06 | 0.05 |
| MF-PSMF020X | 0.28 | 0.25 | 0.23 | 0.20 | 0.17 | 0.14 | 0.12 | 0.10 | 0.07 |
| MF-PSMF035X | 0.47 | 0.44 | 0.39 | 0.35 | 0.30 | 0.27 | 0.24 | 0.20 | 0.14 |
| MF-PSMF050X | 0.68 | 0.62 | 0.55 | 0.50 | 0.40 | 0.37 | 0.33 | 0.29 | 0.23 |
| MF-PSMF075X | 1.00 | 0.90 | 0.79 | 0.75 | 0.63 | 0.57 | 0.53 | 0.42 | 0.35 |
| MF-PSMF110X | 1.45 | 1.35 | 1.20 | 1.10 | 0.92 | 0.84 | 0.75 | 0.65 | 0.52 |

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

**Bourns considers a product to be "halogen free" if (a) the Bromine (Br) content is 900 ppm or less; (b) the Chlorine (Cl) content is 900 ppm or less; and (c) the total Bromine (Br) and Chlorine (Cl) content is 1500 ppm or less.

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.

Additional Applications

- Automotive electronic control modules

MF-PSMF Series - PTC Resettable Fuses

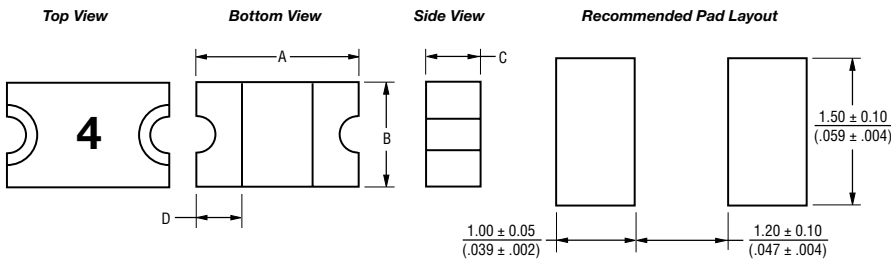
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Product Dimensions

| Model | A | | B | | C | | D |
|----------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| | Min. | Max. | Min. | Max. | Min. | Max. | Min. |
| MF-PSMF010X | $\frac{2.00}{(0.079)}$ | $\frac{2.30}{(0.091)}$ | $\frac{1.20}{(0.047)}$ | $\frac{1.50}{(0.059)}$ | $\frac{0.48}{(0.019)}$ | $\frac{0.85}{(0.033)}$ | $\frac{0.20}{(0.008)}$ |
| MF-PSMF010/24X | $\frac{2.00}{(0.079)}$ | $\frac{2.30}{(0.091)}$ | $\frac{1.20}{(0.047)}$ | $\frac{1.50}{(0.059)}$ | $\frac{0.48}{(0.019)}$ | $\frac{0.85}{(0.033)}$ | $\frac{0.20}{(0.008)}$ |
| MF-PSMF020X | $\frac{2.00}{(0.079)}$ | $\frac{2.30}{(0.091)}$ | $\frac{1.20}{(0.047)}$ | $\frac{1.50}{(0.059)}$ | $\frac{0.48}{(0.019)}$ | $\frac{0.85}{(0.033)}$ | $\frac{0.20}{(0.008)}$ |
| MF-PSMF035X | $\frac{2.00}{(0.079)}$ | $\frac{2.30}{(0.091)}$ | $\frac{1.20}{(0.047)}$ | $\frac{1.50}{(0.059)}$ | $\frac{0.48}{(0.019)}$ | $\frac{0.85}{(0.033)}$ | $\frac{0.20}{(0.008)}$ |
| MF-PSMF050X | $\frac{2.00}{(0.079)}$ | $\frac{2.30}{(0.091)}$ | $\frac{1.20}{(0.047)}$ | $\frac{1.50}{(0.059)}$ | $\frac{0.48}{(0.019)}$ | $\frac{0.85}{(0.033)}$ | $\frac{0.20}{(0.008)}$ |
| MF-PSMF075X | $\frac{2.00}{(0.079)}$ | $\frac{2.30}{(0.091)}$ | $\frac{1.20}{(0.047)}$ | $\frac{1.50}{(0.059)}$ | $\frac{0.75}{(0.030)}$ | $\frac{1.25}{(0.049)}$ | $\frac{0.20}{(0.008)}$ |
| MF-PSMF110X | $\frac{2.00}{(0.079)}$ | $\frac{2.30}{(0.091)}$ | $\frac{1.20}{(0.047)}$ | $\frac{1.50}{(0.059)}$ | $\frac{0.75}{(0.030)}$ | $\frac{1.25}{(0.049)}$ | $\frac{0.20}{(0.008)}$ |

Packaging: 3000 pcs. per reel.

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



Terminal material:

Nickel/gold plated.

Termination pad solderability:

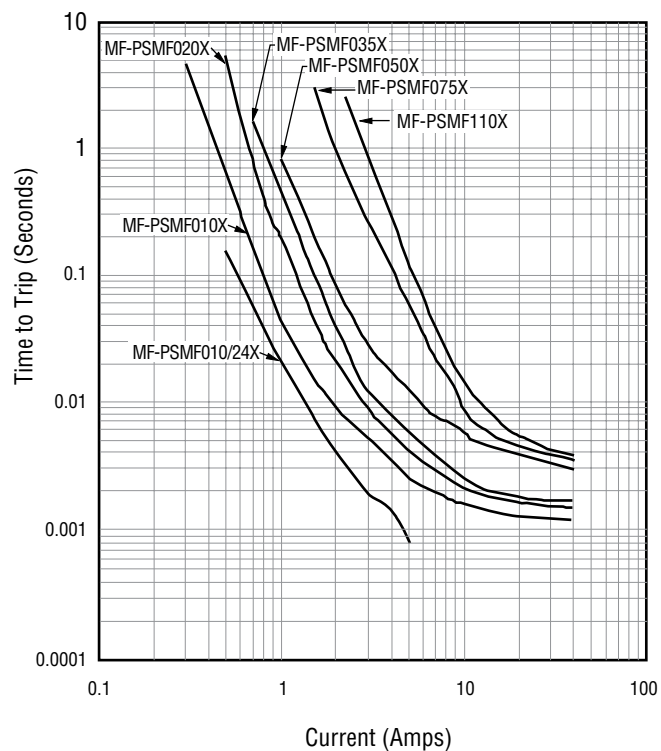
Standard Au finish:
Meets ANSI/J-STD-002 Category 2.

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.

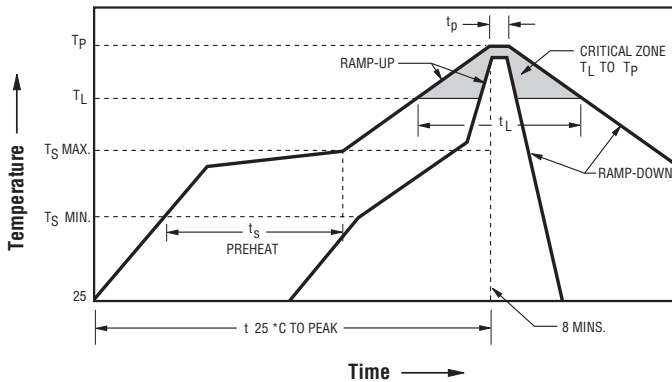


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MF-PSMF Series - PTC Resettable Fuses

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Solder Reflow Recommendations



Notes:

- MF-FSML models cannot be wave soldered or hand soldered. Please contact Bourns for soldering recommendations.
- All temperatures refer to topside of the package, measured on the package body surface.
- If reflow temperatures exceed the recommended profile, devices may not meet the published specifications.
- 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.
- Designed for single solder reflow operations.

| Profile Feature | Pb-Free Assembly |
|---|------------------------------------|
| Average Ramp-Up Rate (T _S max to T _P) | 3 °C / second max. |
| PREHEAT: Temperature Min. (T _S min) Temperature Max. (T _S max) Time (t _S min to t _S max) | 150 °C 200 °C 60~180 seconds |
| TIME MAINTAINED ABOVE: Temperature (T _L) Time (t _L) | 217 °C 60~150 seconds |
| Peak / Classification Temperature (T _P) | 260 °C |
| Time within 5 °C of Actual Peak Temperature (t _p) | 20~40 seconds |
| Ramp-Down Rate | 6 °C / second max. |
| Time within 25 °C to Peak Temperature | 8 minutes max. |

How to Order

MF - PSMF 010 /24 X - 2

Multifuse® Product Designator

Series
PSMF = 0805 Surface Mount Component

Hold Current, I_{hold}
010-110 (0.10 - 1.10 Amps)

Higher Voltage Option
Blank = Standard Voltage
/24 = 24 V

Multifuse® freeExpansion™ Design

Packaging
Packaged per EIA 481-1
-2 = Tape and Reel

Typical Part Marking

Represents total content. Layout may vary.



BIWEEKLY DATE CODE WILL APPEAR ON THE PACKAGING LABEL:
WEEK 1 AND 2 = A
WEEK 51 AND 52 = Z

PART IDENTIFICATION:
MF-PSMF010X = 1
MF-PSMF010/24X = 1
MF-PSMF020X = 2
MF-PSMF035X = 3
MF-PSMF050X = 4
MF-PSMF075X = 5
MF-PSMF110X = 6

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MF-PSMF SERIES, REV. O 05/17

“freeExpansion Design” is a trademark of Bourns, Inc.

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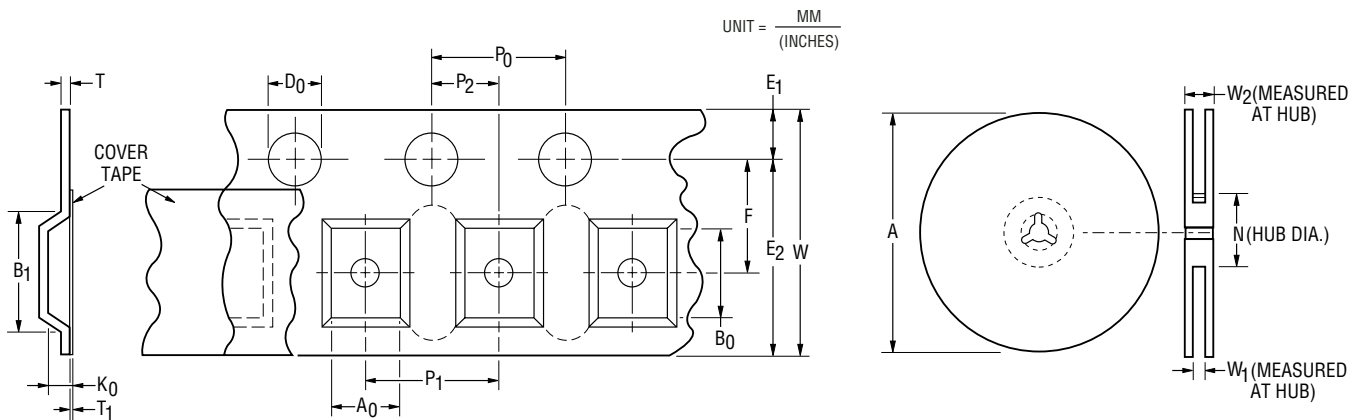
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MF-PSMF Series Tape and Reel Specifications

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| Tape Dimensions | MF-PSMF010X, MF-PSMF010/24X, MF-PSMF020X, MF-PSMF035X & MF-PSMF050X per EIA 481-1 | MF-PSMF075X & MF-PSMF110X per EIA 481-1 |
|------------------------|--|---|
| | W | $\frac{8.0 \pm 0.30}{(0.315 \pm 0.012)}$ |
| P ₀ | $\frac{4.0 \pm 0.10}{(0.157 \pm 0.004)}$ | $\frac{4.0 \pm 0.10}{(0.157 \pm 0.004)}$ |
| P ₁ | $\frac{4.0 \pm 0.10}{(0.157 \pm 0.004)}$ | $\frac{4.0 \pm 0.10}{(0.157 \pm 0.004)}$ |
| P ₂ | $\frac{2.0 \pm 0.05}{(0.079 \pm 0.002)}$ | $\frac{2.0 \pm 0.05}{(0.079 \pm 0.002)}$ |
| A ₀ | $\frac{1.65 \pm 0.10}{(0.065 \pm 0.004)}$ | $\frac{1.65 \pm 0.10}{(0.065 \pm 0.004)}$ |
| B ₀ | $\frac{2.4 \pm 0.10}{(0.094 \pm 0.004)}$ | $\frac{2.4 \pm 0.10}{(0.094 \pm 0.004)}$ |
| B ₁ max. | $\frac{4.35}{(0.171)}$ | $\frac{4.35}{(0.171)}$ |
| D ₀ | $\frac{1.50 + 0.10/-0.0}{(0.059 + 0.004/-0)}$ | $\frac{1.50 + 0.10/-0.0}{(0.059 + 0.004/-0)}$ |
| F | $\frac{3.5 \pm 0.05}{(0.138 \pm 0.002)}$ | $\frac{3.5 \pm 0.05}{(0.138 \pm 0.002)}$ |
| E ₁ | $\frac{1.75 \pm 0.10}{(0.069 \pm 0.004)}$ | $\frac{1.75 \pm 0.10}{(0.069 \pm 0.004)}$ |
| E ₂ min. | $\frac{6.25}{(0.246)}$ | $\frac{6.25}{(0.246)}$ |
| T max. | $\frac{0.6}{(0.024)}$ | $\frac{0.6}{(0.024)}$ |
| T ₁ max. | $\frac{0.10}{(0.004)}$ | $\frac{0.10}{(0.004)}$ |
| K ₀ | $\frac{0.95 \pm 0.10}{(0.037 \pm 0.004)}$ | $\frac{1.25 \pm 0.10}{(0.049 \pm 0.004)}$ |
| Leader min. | $\frac{390}{(15.35)}$ | $\frac{390}{(15.35)}$ |
| Trailer min. | $\frac{160}{(6.30)}$ | $\frac{160}{(6.30)}$ |
| Reel Dimensions | | |
| A max. | $\frac{185}{(7.28)}$ | $\frac{185}{(7.28)}$ |
| N min. | $\frac{50}{(1.97)}$ | $\frac{50}{(1.97)}$ |
| W ₁ | $\frac{8.4 + 1.5/-0.0}{(0.331 + 0.059/-0)}$ | $\frac{8.4 + 1.5/-0.0}{(0.331 + 0.059/-0)}$ |
| W ₂ max. | $\frac{14.4}{(0.567)}$ | $\frac{14.4}{(0.567)}$ |



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