



Features

- Fast tripping resettable circuit protection
- Surface mount packaging for automated assembly
- Small footprint size (1210)
- RoHS compliant* and halogen free**
- Agency recognition*   

Applications

- Game consoles
- PC motherboards
- USB port protection - USB 2.0, 3.0 & OTG
- HDMI 1.4 Source protection
- IEEE 1394 ports
- Mobile phones
- Digital cameras

MF-USMF 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-USMF005 | 30 | 10 | 0.05 | 0.15 | 2.800 | 50.000 | 0.25 | 1.50 | 0.6 |
| MF-USMF010 | 30 | 10 | 0.10 | 0.30 | 0.800 | 15.000 | 0.50 | 0.60 | 0.6 |
| MF-USMF020 | 30 | 10 | 0.20 | 0.40 | 0.400 | 5.000 | 8.00 | 0.02 | 0.6 |
| MF-USMF035 | 6 | 40 | 0.35 | 0.75 | 0.200 | 1.300 | 8.00 | 0.20 | 0.6 |
| MF-USMF050 | 13.2 | 40 | 0.50 | 1.00 | 0.180 | 0.900 | 8.00 | 0.10 | 0.6 |
| MF-USMF075 | 6 | 40 | 0.75 | 1.50 | 0.070 | 0.450 | 8.00 | 0.10 | 0.6 |
| MF-USMF110 | 6 | 40 | 1.10 | 2.20 | 0.050 | 0.210 | 5.00 | 1.00 | 0.6 |
| MF-USMF150 | 6 | 40 | 1.50 | 3.00 | 0.030 | 0.110 | 5.00 | 5.00 | 0.6 |
| MF-USMF175X*** | 6 | 40 | 1.75 | 3.50 | 0.020 | 0.090 | 8.00 | 1.00 | 0.7 |

*** CSA approval pending.

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-USMF 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 | |
| CSA File Number..... | CA110338 http://directories.csa-international.org/ Under "Certification Record" and "File Number" enter 110338-0-000 | |
| TÜV Certificate Number | R 02057213 http://www.tuvdotcom.com/ Follow link to "other certificates", enter File No. 2057213 | |

*RoHS Directive 2002/95/EC Jan 27 2003 including Annex.

**To be considered halogen free, each homogenous material can have a maximum concentration of 900 ppm of either bromine or chlorine.

Specifications are subject to change without notice.

Customers should verify actual device performance in their specific applications.

MF-USMF Series - PTC Resettable Fuses

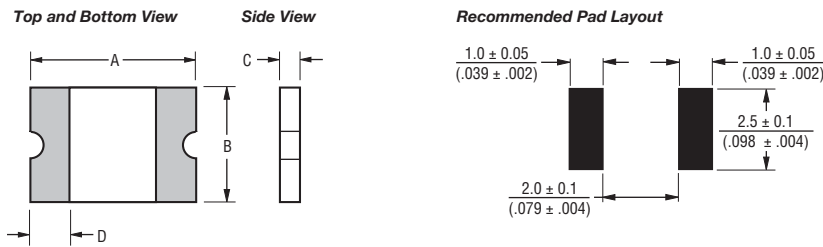
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Product Dimensions

| Model | A | | B | | C | | D |
|-------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| | Min. | Max. | Min. | Max. | Min. | Max. | Min. |
| MF-USMF005 | $\frac{3.00}{(0.118)}$ | $\frac{3.43}{(0.135)}$ | $\frac{2.35}{(0.093)}$ | $\frac{2.80}{(0.110)}$ | $\frac{0.80}{(0.031)}$ | $\frac{1.1}{(0.043)}$ | $\frac{0.30}{(0.012)}$ |
| MF-USMF010 | $\frac{3.00}{(0.118)}$ | $\frac{3.43}{(0.135)}$ | $\frac{2.35}{(0.093)}$ | $\frac{2.80}{(0.110)}$ | $\frac{0.80}{(0.031)}$ | $\frac{1.1}{(0.043)}$ | $\frac{0.30}{(0.012)}$ |
| MF-USMF020 | $\frac{3.00}{(0.118)}$ | $\frac{3.43}{(0.135)}$ | $\frac{2.35}{(0.093)}$ | $\frac{2.80}{(0.110)}$ | $\frac{0.80}{(0.031)}$ | $\frac{1.1}{(0.043)}$ | $\frac{0.30}{(0.012)}$ |
| MF-USMF035 | $\frac{3.00}{(0.118)}$ | $\frac{3.43}{(0.135)}$ | $\frac{2.35}{(0.093)}$ | $\frac{2.80}{(0.110)}$ | $\frac{0.55}{(0.022)}$ | $\frac{0.85}{(0.033)}$ | $\frac{0.30}{(0.012)}$ |
| MF-USMF050 | $\frac{3.00}{(0.118)}$ | $\frac{3.43}{(0.135)}$ | $\frac{2.35}{(0.093)}$ | $\frac{2.80}{(0.110)}$ | $\frac{0.55}{(0.022)}$ | $\frac{0.85}{(0.033)}$ | $\frac{0.30}{(0.012)}$ |
| MF-USMF075 | $\frac{3.00}{(0.118)}$ | $\frac{3.43}{(0.135)}$ | $\frac{2.35}{(0.093)}$ | $\frac{2.80}{(0.110)}$ | $\frac{0.55}{(0.022)}$ | $\frac{0.85}{(0.033)}$ | $\frac{0.30}{(0.012)}$ |
| MF-USMF110 | $\frac{3.00}{(0.118)}$ | $\frac{3.43}{(0.135)}$ | $\frac{2.35}{(0.093)}$ | $\frac{2.80}{(0.110)}$ | $\frac{0.55}{(0.022)}$ | $\frac{0.85}{(0.033)}$ | $\frac{0.30}{(0.012)}$ |
| MF-USMF150 | $\frac{3.00}{(0.118)}$ | $\frac{3.43}{(0.135)}$ | $\frac{2.35}{(0.093)}$ | $\frac{2.80}{(0.110)}$ | $\frac{0.40}{(0.016)}$ | $\frac{0.85}{(0.033)}$ | $\frac{0.30}{(0.012)}$ |
| MF-USMF175X | $\frac{3.00}{(0.118)}$ | $\frac{3.43}{(0.135)}$ | $\frac{2.35}{(0.093)}$ | $\frac{2.80}{(0.110)}$ | $\frac{0.40}{(0.016)}$ | $\frac{0.85}{(0.033)}$ | $\frac{0.30}{(0.012)}$ |

Packaging: 3000 pcs. per reel.

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



Terminal material:

Electroless Ni under immersion Au

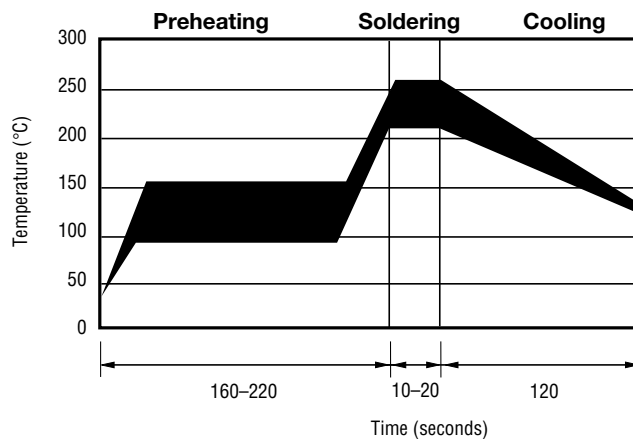
Termination pad solderability:

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

Recommended Storage:

40 °C max./70 % RH max.

Solder Reflow Recommendations



Notes:

- MF-USMF models cannot be wave soldered.
- 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.

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MF-USMF 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-USMF005 | 0.08 | 0.07 | 0.06 | 0.05 | 0.04 | 0.04 | 0.03 | 0.03 | 0.02 |
| MF-USMF010 | 0.15 | 0.13 | 0.12 | 0.10 | 0.09 | 0.08 | 0.07 | 0.06 | 0.05 |
| MF-USMF020 | 0.32 | 0.28 | 0.24 | 0.20 | 0.18 | 0.16 | 0.14 | 0.12 | 0.10 |
| MF-USMF035 | 0.51 | 0.46 | 0.40 | 0.34 | 0.30 | 0.27 | 0.24 | 0.22 | 0.18 |
| MF-USMF050 | 0.76 | 0.66 | 0.58 | 0.48 | 0.42 | 0.38 | 0.35 | 0.29 | 0.23 |
| MF-USMF075 | 1.10 | 0.97 | 0.86 | 0.72 | 0.64 | 0.58 | 0.55 | 0.47 | 0.39 |
| MF-USMF110 | 1.60 | 1.42 | 1.26 | 1.10 | 0.94 | 0.86 | 0.80 | 0.70 | 0.58 |
| MF-USMF150 | 2.30 | 2.02 | 1.76 | 1.43 | 1.24 | 1.11 | 1.00 | 0.85 | 0.65 |
| MF-USMF175X | 2.80 | 2.45 | 2.10 | 1.75 | 1.55 | 1.45 | 1.35 | 1.25 | 1.10 |

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.

How to Order

MF - USMF 010 X - 2

Multifuse® Product Designator _____
 Series _____
 USMF = 1210 Surface Mount Component
 Hold Current, I_{hold} _____
 005-175 (0.05-1.75 Amps)
 Multifuse® freeXpansion™ Design _____
 Packaging _____
 Packaged per EIA 481-1
 -2 = Tape and Reel

Typical Part Marking

Represents total content. Layout may vary.



Asia-Pacific: TEL +886-2 25624117 • FAX +886-2 25624116
Europe: TEL +41-41 7685555 • FAX +41-41 7685510
The Americas: TEL +1-951 781-5500 • FAX +1-951 781-5700
www.bourns.com

MF-USMF SERIES, REV. M, 04/10

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



MF-USMF Series per EIA 481-2

Tape Dimensions

| | |
|---------------------|---|
| W | $\frac{8.0 \pm 0.3}{(0.315 \pm 0.012)}$ |
| P ₀ | $\frac{4.0 \pm 0.1}{(0.157 \pm 0.004)}$ |
| P ₁ | $\frac{4.0 \pm 0.1}{(0.157 \pm 0.004)}$ |
| P ₂ | $\frac{2.0 \pm 0.05}{(0.079 \pm 0.002)}$ |
| A ₀ | $\frac{2.76 \pm 0.10}{(0.109 \pm 0.004)}$ |
| B ₀ | $\frac{3.50 \pm 0.10}{(0.138 \pm 0.004)}$ |
| B ₁ max. | $\frac{4.35}{(0.171)}$ |
| D ₀ | $\frac{1.5 + 0.1/-0.0}{(0.059 + 0.004/-0)}$ |
| F | $\frac{3.5 \pm 0.05}{(0.138 \pm 0.002)}$ |
| E ₁ | $\frac{1.75 \pm 0.10}{(0.069 \pm 0.004)}$ |
| E ₂ min. | $\frac{6.25}{(0.246)}$ |
| T max. | $\frac{0.6}{(0.024)}$ |
| T ₁ max. | $\frac{0.1}{(0.004)}$ |
| K ₀ | $\frac{1.07 \pm 0.10}{(0.042 \pm 0.004)}$ |
| Leader min. | $\frac{390}{(15.35)}$ |
| Trailer min. | $\frac{160}{(6.30)}$ |

Reel Dimensions

| | |
|---------------------|---|
| A max. | $\frac{185}{(7.283)}$ |
| N min. | $\frac{50}{(1.97)}$ |
| W ₁ | $\frac{8.4 + 1.5/-0.0}{(0.331 + 0.059/-0.0)}$ |
| W ₂ max. | $\frac{14.4}{(0.567)}$ |



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Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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