



**BOURNS®**

**Features**

- Radial Leaded Devices
- Cured, flame retardant epoxy polymer insulating material meets UL 94V-0 requirements
- Agency recognition:   
- RoHS compliant\*

 The MF-RX Series is currently available, although not recommended for new designs. The higher voltage rated **MF-RX/72 Series** is preferred.

**MF-RX Series - PTC Resettable Fuses**

**Electrical Characteristics**

| Model    | V max. Volts | I max. Amps | I <sub>hold</sub> | I <sub>trip</sub> | Initial Resistance |      | 1 Hour (R <sub>1</sub> ) Post-Trip Resistance | Max. Time to Trip |                  | Tripped Power Dissipation |
|----------|--------------|-------------|-------------------|-------------------|--------------------|------|-----------------------------------------------|-------------------|------------------|---------------------------|
|          |              |             | Amperes at 23 °C  |                   | Ohms at 23 °C      |      | Ohms at 23 °C                                 | Amperes at 23 °C  | Seconds at 23 °C | Watts at 23 °C            |
|          |              |             | Hold              | Trip              | Min.               | Max. | Max.                                          |                   |                  | Typ.                      |
| MF-RX110 | 60           | 40          | 1.10              | 2.20              | 0.15               | 0.25 | 0.38                                          | 5.5               | 8.2              | 1.50                      |
| MF-RX135 | 60           | 40          | 1.35              | 2.70              | 0.12               | 0.19 | 0.30                                          | 6.75              | 9.6              | 1.70                      |
| MF-RX160 | 60           | 40          | 1.60              | 3.20              | 0.09               | 0.14 | 0.22                                          | 8.0               | 11.4             | 1.90                      |
| MF-RX185 | 60           | 40          | 1.85              | 3.70              | 0.08               | 0.12 | 0.19                                          | 9.25              | 12.6             | 2.10                      |
| MF-RX250 | 60           | 40          | 2.50              | 5.00              | 0.05               | 0.08 | 0.13                                          | 12.5              | 15.6             | 2.50                      |
| MF-RX300 | 60           | 40          | 3.00              | 6.00              | 0.04               | 0.06 | 0.10                                          | 15.0              | 19.8             | 2.80                      |
| MF-RX375 | 60           | 40          | 3.75              | 7.50              | 0.03               | 0.05 | 0.08                                          | 18.75             | 24.0             | 3.20                      |

**Environmental Characteristics**

Operating/Storage 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..... -40 °C to +85 °C, 10 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-RX Series**

| Test                 | Test Conditions                                           | Accept/Reject Criteria                  |
|----------------------|-----------------------------------------------------------|-----------------------------------------|
| Visual/Mech.....     | Verify dimensions and materials.....                      | Per MF physical description             |
| Resistance.....      | In still air @ 23 °C.....                                 | R <sub>min</sub> ≤ R ≤ R <sub>max</sub> |
| Time to Trip.....    | 5 times I <sub>hold</sub> , V <sub>max</sub> , 23 °C..... | T ≤ max. time to trip (seconds)         |
| Hold Current.....    | 30 min. at I <sub>hold</sub> .....                        | No trip                                 |
| Trip Cycle Life..... | V <sub>max</sub> , I <sub>max</sub> , 100 cycles.....     | No arcing or burning                    |
| Trip Endurance.....  | V <sub>max</sub> , 48 hours.....                          | No arcing or burning                    |

UL File Number ..... E 174545S  
 CSA File Number..... CA 110338  
 TÜV File Number ..... R2057213

**Thermal Derating Chart - I<sub>hold</sub> / I<sub>trip</sub> (Amps)**

| Model    | Ambient Operating Temperature |             |             |             |             |             |             |             |             |
|----------|-------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|          | -40 °C                        | -20 °C      | 0 °C        | 23 °C       | 40 °C       | 50 °C       | 60 °C       | 70 °C       | 85 °C       |
| MF-RX110 | 1.71 / 3.42                   | 1.50 / 3.00 | 1.31 / 2.62 | 1.10 / 2.20 | 0.89 / 1.78 | 0.79 / 1.58 | 0.69 / 1.38 | 0.59 / 1.18 | 0.44 / 0.88 |
| MF-RX135 | 2.09 / 4.18                   | 1.84 / 3.68 | 1.61 / 3.22 | 1.35 / 2.70 | 1.09 / 2.18 | 0.97 / 1.94 | 0.85 / 1.70 | 0.73 / 1.46 | 0.54 / 1.08 |
| MF-RX160 | 2.48 / 4.96                   | 2.18 / 4.36 | 1.90 / 3.80 | 1.60 / 3.20 | 1.30 / 2.60 | 1.15 / 2.30 | 1.01 / 2.02 | 0.86 / 1.72 | 0.64 / 1.28 |
| MF-RX185 | 2.87 / 5.74                   | 2.52 / 5.04 | 2.20 / 4.40 | 1.85 / 3.70 | 1.50 / 3.00 | 1.33 / 2.66 | 1.17 / 2.34 | 1.00 / 2.00 | 0.74 / 1.48 |
| MF-RX250 | 3.88 / 7.76                   | 3.40 / 6.80 | 2.98 / 5.96 | 2.50 / 5.00 | 2.03 / 4.06 | 1.80 / 3.60 | 1.58 / 3.16 | 1.35 / 2.70 | 1.00 / 2.00 |
| MF-RX300 | 4.65 / 9.30                   | 4.08 / 8.16 | 3.57 / 7.14 | 3.00 / 6.00 | 2.43 / 4.86 | 2.16 / 4.32 | 1.89 / 3.78 | 1.62 / 3.24 | 1.20 / 2.40 |
| MF-RX375 | 5.81 / 11.6                   | 5.10 / 10.2 | 4.46 / 8.92 | 3.75 / 7.50 | 3.04 / 6.08 | 2.70 / 5.40 | 2.36 / 4.72 | 2.03 / 4.06 | 1.50 / 3.00 |

\*RoHS Directive 2002/95/EC Jan 27, 2003 including Annex.  
 Specifications are subject to change without notice.  
 Customers should verify actual device performance in their specific applications.

## Additional Features

- Bulk packaging, tape and reel and Ammo-Pak available on most models
- Resettable circuit protection

## Applications

Almost anywhere there is a low voltage power supply, up to 60 V and a load to be protected, including:

- Security and fire alarm systems
- Loud speakers
- Power transformers

# MF-RX Series - PTC Resettable Fuses

# BOURNS®

### Product Dimensions

| Model    | A<br>Max.       | B<br>Max.       | C               |                | D<br>Min.      | E<br>Max.      | Physical Characteristics |                 |          |
|----------|-----------------|-----------------|-----------------|----------------|----------------|----------------|--------------------------|-----------------|----------|
|          |                 |                 | Nom.            | Tol. ±         |                |                | Style                    | Lead Dia.       | Material |
| MF-RX110 | 13.0<br>(0.512) | 18.0<br>(0.709) | 5.1<br>(0.201)  | 0.7<br>(0.028) | 7.6<br>(0.299) | 3.1<br>(0.122) | 1                        | 0.81<br>(0.032) | Sn/Cu    |
| MF-RX135 | 14.5<br>(0.571) | 19.6<br>(0.772) | 5.1<br>(0.201)  | 0.7<br>(0.028) | 7.6<br>(0.299) | 3.1<br>(0.122) | 1                        | 0.81<br>(0.032) | Sn/Cu    |
| MF-RX160 | 16.3<br>(0.642) | 21.3<br>(0.839) | 5.1<br>(0.201)  | 0.7<br>(0.028) | 7.6<br>(0.299) | 3.1<br>(0.122) | 1                        | 0.81<br>(0.032) | Sn/Cu    |
| MF-RX185 | 17.8<br>(0.701) | 22.9<br>(0.902) | 5.1<br>(0.201)  | 0.7<br>(0.028) | 7.6<br>(0.299) | 3.1<br>(0.122) | 1                        | 0.81<br>(0.032) | Sn/Cu    |
| MF-RX250 | 21.3<br>(0.839) | 26.4<br>(1.039) | 10.2<br>(0.402) | 0.7<br>(0.028) | 7.6<br>(0.299) | 3.1<br>(0.122) | 1                        | 0.81<br>(0.032) | Sn/Cu    |
| MF-RX300 | 24.9<br>(0.980) | 30.0<br>(1.181) | 10.2<br>(0.402) | 0.7<br>(0.028) | 7.6<br>(0.299) | 3.1<br>(0.122) | 1                        | 0.81<br>(0.032) | Sn/Cu    |
| MF-RX375 | 28.4<br>(1.118) | 33.5<br>(1.319) | 10.2<br>(0.402) | 0.7<br>(0.028) | 7.6<br>(0.299) | 3.1<br>(0.122) | 1                        | 0.81<br>(0.032) | Sn/Cu    |

Packaging options:

BULK: All models = 500 pcs. per bag.

TAPE & REEL: MF-RX110 – MF-RX160 = 1500 pcs. per reel; MF-RX185 – MF-RX375 = 1000 pcs. per reel

AMMO-PACK: MF-RX110 – MF-RX160 = 1000 pcs. per reel; MF-RX185 – MF-RX375 = 500 pcs. per reel

0.81 (20AWG)



NOTE: Kinked lead option is available for board standoff. Contact factory for details.

### Typical Part Marking

Represents total content. Layout may vary.



### How to Order

#### MF - RX 110 - 0 - 99

- Multifuse® Product Designator
- Series RX = Radial Leaded Component
- Hold Current, I<sub>hold</sub> 110-375 (1.10 Amps - 3.75 Amps)
- Packaging Options
  - = Bulk Packaging without part number suffix option
  - 0-99 = Bulk Packaging with part number suffix option
  - 2 = Tape and Reel without part number suffix option\*
  - 2-99 = Tape and Reel with part number suffix option\*
  - AP = Ammo-Pak\*
  - 0-14 = Kinked leads where straight leads are standard
  - 0-17 = Straight leads where kinked leads are standard

#### Part Number Suffix Option

- 99 = As of date code April 1, 2005 all MF-RX models are RoHS compliant. The suffix "-99" can be used if a new part number is required to reference the RoHS compliance.
- Examples:
  - MF-RX110 ..... Bulk packaging
  - MF-RX110-0-99 ..... Bulk packaging with part number suffix option
  - MF-RX110-2 ..... Tape and reel packaging
  - MF-RX110-2-99 ..... Tape and reel packaging with part number suffix option

\*Packaged per EIA486-B

### Typical Time to Trip at 23 °C



MF-RX SERIES, REV. M, 05/11

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# MF-R, MF-R/90, MF-R/600, MF-RX, MF-RX/72 & MF-RX/250 Series Tape and Reel Specifications

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Devices taped using EIA468-B/IEC286-2 standards. See table below and Figures 1 and 2 for details.

| Dimension Description                                                                                | IEC Mark   | EIA Mark   | Dimensions             |                                    |
|------------------------------------------------------------------------------------------------------|------------|------------|------------------------|------------------------------------|
|                                                                                                      |            |            | Dimensions             | Tolerance                          |
| Carrier tape width                                                                                   | $W$        | $W$        | $\frac{18}{(.709)}$    | $\frac{-0.5/+1.0}{(-0.02/+0.039)}$ |
| Hold down tape width                                                                                 | $W_0$      | $W_4$      | $\frac{11}{(.433)}$    | min.                               |
| Hold down tape                                                                                       |            |            | No protrusion          |                                    |
| Top distance between tape edges                                                                      | $W_2$      | $W_6$      | $\frac{3}{(.118)}$     | max.                               |
| Sprocket hole position                                                                               | $W_1$      | $W_5$      | $\frac{9}{(.354)}$     | $\frac{-0.5/+0.75}{(-0.02/+0.03)}$ |
| Sprocket hole diameter                                                                               | $D_0$      | $D_0$      | $\frac{4}{(.157)}$     | $\frac{\pm 0.2}{(\pm .0078)}$      |
| Abscissa to plane (straight lead)                                                                    | $H$        | $H$        | $\frac{18.5}{(.728)}$  | $\frac{\pm 3.0}{(\pm .118)}$       |
| Abscissa to plane (kinked lead)                                                                      | $H_0$      | $H_0$      | $\frac{16}{(.63)}$     | $\frac{\pm 0.5}{(\pm .02)}$        |
| Abscissa to top (straight lead)                                                                      | $H_1$      | $H_1$      | $\frac{38.0}{(1.496)}$ | max.                               |
| Abscissa to top (kinked lead)                                                                        | $H_1$      | $H_1$      | $\frac{32.2}{(1.268)}$ | max.                               |
| Overall width w/lead protrusion (straight lead)                                                      |            | $C_1$      | $\frac{55.0}{(2.165)}$ | max.                               |
| Overall width w/lead protrusion (kinked lead)                                                        |            | $C_1$      | $\frac{43.2}{(1.7)}$   | max.                               |
| Overall width w/o lead protrusion (straight lead)                                                    |            | $C_2$      | $\frac{54.0}{(2.126)}$ | max.                               |
| Overall width w/o lead protrusion (kinked lead)                                                      |            | $C_2$      | $\frac{42.5}{(1.673)}$ | max.                               |
| Lead protrusion                                                                                      | $l_1$      | $L_1$      | $\frac{1.0}{(.039)}$   | max.                               |
| Protrusion of cutout                                                                                 | $L$        | $L$        | $\frac{11}{(.433)}$    | max.                               |
| Protrusion beyond hold-down tape                                                                     | $l_2$      | $l_2$      | Not specified          |                                    |
| Sprocket hole pitch                                                                                  | $P_0$      | $P_0$      | $\frac{12.7}{(0.5)}$   | $\frac{\pm 0.3}{(\pm .012)}$       |
| Pitch tolerance                                                                                      |            |            | 20 consecutive         | $\frac{\pm 1}{(\pm .039)}$         |
| Device pitch: MF-R005–MF-R160, MF-R/90,<br>MF-RX110/72–MF-RX185/72                                   |            |            | $\frac{12.7}{(0.5)}$   | $\frac{\pm 0.3}{(\pm .012)}$       |
| Device pitch: MF-R185–MF-R400, MF-RX110–MF-RX375<br>MF-R/600, MF-RX250/72–MF-RX375/72                |            |            | $\frac{25.4}{(1.0)}$   | $\frac{\pm 0.6}{(\pm .024)}$       |
| Tape thickness                                                                                       | $t$        | $t$        | $\frac{0.9}{(.035)}$   | max.                               |
| Tape thickness with splice: MF-R010–MF-R160,<br>MF-RX110/72–MF-RX185/72                              |            | $t_1$      | $\frac{1.5}{(.059)}$   | max.                               |
| Tape thickness with splice: MF-R250–MF-R1100,<br>MF-RX110–MF-RX375, MF-R/90, MF-RX250/72–MF-RX375/72 |            | $t_1$      | $\frac{2.3}{(.091)}$   | max.                               |
| Splice sprocket hole alignment                                                                       |            |            | 0                      | $\frac{\pm 0.3}{(\pm .012)}$       |
| Body lateral deviation                                                                               | $\Delta_h$ | $\Delta_h$ | 0                      | $\frac{\pm 1.0}{(\pm .039)}$       |
| Body tape plane deviation                                                                            | $\Delta_p$ | $\Delta_p$ | 0                      | $\frac{\pm 1.3}{(\pm .051)}$       |

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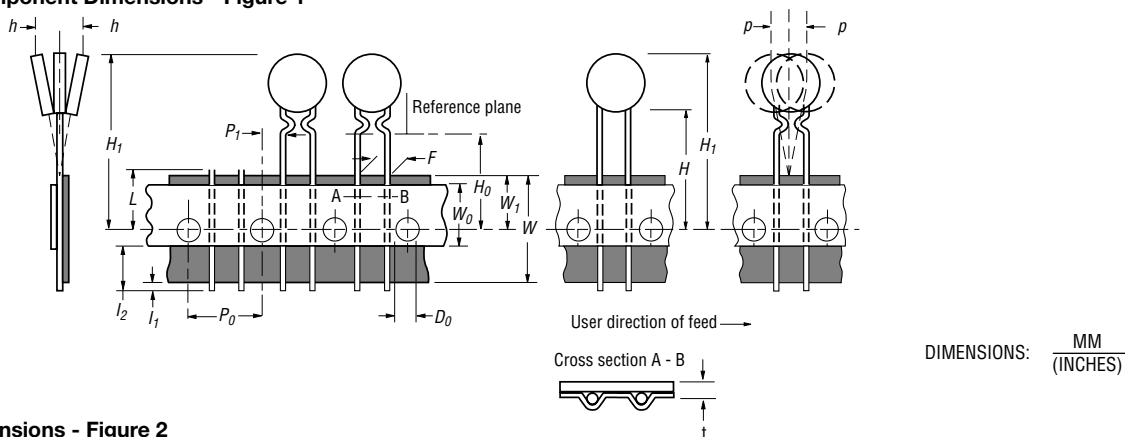
DIMENSIONS:  $\frac{\text{MM}}{\text{(INCHES)}}$

# MF-R, MF-R/90, MF-R/600, MF-RX, MF-RX/72 & MF-RX/250 Series Tape and Reel Specifications

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| Dimension Description                                  | IEC Mark       | EIA Mark       | Dimensions       |                                    |                |               |
|--------------------------------------------------------|----------------|----------------|------------------|------------------------------------|----------------|---------------|
|                                                        |                |                | Dimensions       | Tolerance                          |                |               |
| Lead spacing: MF-R, MF-R/90, MF-R/600, MF-RX, MF-RX/72 | F              | F              | 5.08<br>(0.2)    | $\pm 0.2$<br>( $\pm 0.008$ )       |                |               |
| Lead spacing: MF-RX/250                                | F              | F              | 5.08<br>(0.2)    | $-0.5/+0.6$<br>( $-0.020/+0.024$ ) |                |               |
| Reel width                                             | w              | W <sub>2</sub> | 56.0<br>(2.205)  | max.                               |                |               |
| Reel diameter                                          | d              | a              | 370.0<br>(14.57) | max.                               |                |               |
| Space between flanges less device                      | W <sub>1</sub> | h              | 4.75<br>(.187)   | $\pm 3.25$<br>( $\pm .128$ )       |                |               |
| Arbor hole diameter                                    | f              | c              | 26.0<br>(1.024)  | $\pm 12.0$<br>( $\pm .472$ )       |                |               |
| Core diameter: MF-R, MF-RX, MF-R/90                    | h              | n              | 80<br>(3.15)     | max.                               |                |               |
| Core diameter: MF-RX/250, MF-R/600                     | h              | n              | 91<br>(3.58)     | max.                               |                |               |
| Box: MF-R, MF-RX, MF-R/90                              |                |                | 56<br>(2.2)      | 372<br>(14.6)                      | 372<br>(14.6)  | max.          |
| Box: MF-RX/250                                         |                |                | 67<br>(2.64)     | 372<br>(14.6)                      | 362<br>(14.25) | max.          |
| Box: MF-R/600                                          |                |                | 64<br>(2.52)     | 372<br>(14.6)                      | 362<br>(14.25) | max.          |
| Consecutive missing places: MF-R, MF-RX, MF-R/90       |                |                | 3                |                                    |                | max.          |
| Consecutive missing places: MF-RX/250, MF-R/600        |                |                | none             |                                    |                |               |
| Empty places per reel: MF-R, MF-RX, MF-R/90            |                |                |                  |                                    |                | Not specified |
| Empty places per reel: MF-RX/250, MF-R/600             |                |                |                  |                                    |                | 0.1 %         |

**Taped Component Dimensions - Figure 1**



**Reel Dimensions - Figure 2**



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

Наши преимущества:

- Поставка оригинальных импортных электронных компонентов напрямую с производств Америки, Европы и Азии, а так же с крупнейших складов мира;
- Широкая линейка поставок активных и пассивных импортных электронных компонентов (более 30 млн. наименований);
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Помощь Конструкторского Отдела и консультации квалифицированных инженеров;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Поставка электронных компонентов под контролем ВП;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- При необходимости вся продукция военного и аэрокосмического назначения проходит испытания и сертификацию в лаборатории (по согласованию с заказчиком);
- Поставка специализированных компонентов военного и аэрокосмического уровня качества (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Actel, Aeroflex, Peregrine, VPT, Syfer, Eurofarad, Texas Instruments, MS Kennedy, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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## JONHON

«JONHON» (основан в 1970 г.)

Разъемы специального, военного и аэрокосмического назначения:

(Применяются в военной, авиационной, аэрокосмической, морской, железнодорожной, горно- и нефтедобывающей отраслях промышленности)

«FORSTAR» (основан в 1998 г.)

ВЧ соединители, коаксиальные кабели,  
кабельные сборки и микроволновые компоненты:

(Применяются в телекоммуникациях гражданского и специального назначения, в средствах связи, РЛС, а так же военной, авиационной и аэрокосмической отраслях промышленности).



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