


## Features

- 72 V rated
- Radial leaded devices
- Cured, flame retardant epoxy polymer insulating material meets UL 94 V-0 requirements
- RoHS compliant\* and halogen free\*\*
- Agency recognition: 

## Applications

Almost anywhere there is a low voltage power supply, up to 72 V and a load to be protected, including:

- Security and fire alarm systems
- Loudspeakers
- Power transformers

# MF-RX/72 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-RX020/72	72	40	0.20	0.40	1.50	2.84	4.40	1.0	2.2	0.40
MF-RX025/72	72	40	0.25	0.50	1.00	1.95	3.00	1.25	2.5	0.45
MF-RX030/72	72	40	0.30	0.60	0.76	1.36	2.10	1.5	3.0	0.50
MF-RX040/72	72	40	0.40	0.80	0.52	0.86	1.29	2.0	3.9	0.55
MF-RX050/72	72	40	0.50	1.00	0.41	0.77	1.17	2.5	4.0	0.75
MF-RX065/72	72	40	0.65	1.30	0.27	0.48	0.72	3.25	5.3	0.90
MF-RX075/72	72	40	0.75	1.50	0.18	0.40	0.60	3.75	6.3	0.90
MF-RX090/72	72	40	0.90	1.80	0.14	0.31	0.47	4.5	7.2	1.00
MF-RX110/72	72	40	1.10	2.20	0.15	0.25	0.38	5.5	8.2	1.50
MF-RX135/72	72	40	1.35	2.70	0.12	0.19	0.30	6.75	9.6	1.70
MF-RX160/72	72	40	1.60	3.20	0.09	0.14	0.22	8.0	11.4	1.90
MF-RX185/72	72	40	1.85	3.70	0.08	0.12	0.19	9.25	12.6	2.10
MF-RX250/72	72	40	2.50	5.00	0.05	0.08	0.13	12.5	15.6	2.50
MF-RX300/72	72	40	3.00	6.00	0.04	0.06	0.10	15.0	19.8	2.80
MF-RX375/72	72	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 .....	+85 °C to -55 °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/72 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 .....	E174545 <a href="http://www.ul.com/">http://www.ul.com/</a> Follow link to Certifications, then UL File No., enter E174545	
TÜV Certificate Number .....	R 02057213 <a href="http://www.tuvdotcom.com/">http://www.tuvdotcom.com/</a> Follow link to "other certificates", enter File No. 2057213	

\* 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.

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## Additional Features

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

# MF-RX/72 Series - PTC Resettable Fuses

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### Product Dimensions

Model	A		B		C		D		E		Physical Characteristics		
	Max.	Max.	Nom.	Tol. ±	Min.	Max.	Style	Lead Dia.	Material				
MF-RX020/72	7.4 (0.291)	12.7 (0.5)	5.1 (0.201)	0.7 (0.028)	7.6 (0.30)	3.1 (0.122)	1	0.51 (0.020)	Sn/CuFe				
MF-RX025/72	7.4 (0.291)	12.7 (0.5)	5.1 (0.201)	0.7 (0.028)	7.6 (0.30)	3.1 (0.122)	1	0.51 (0.020)	Sn/CuFe				
MF-RX030/72	7.4 (0.291)	13.4 (0.528)	5.1 (0.201)	0.7 (0.028)	7.6 (0.30)	3.1 (0.122)	1	0.51 (0.020)	Sn/CuFe				
MF-RX040/72	7.4 (0.291)	13.7 (0.539)	5.1 (0.201)	0.7 (0.028)	7.6 (0.30)	3.1 (0.122)	1	0.51 (0.020)	Sn/CuFe				
MF-RX050/72	7.9 (0.311)	13.7 (0.539)	5.1 (0.201)	0.7 (0.028)	7.6 (0.30)	3.1 (0.122)	1	0.51 (0.020)	Sn/Cu				
MF-RX065/72	9.7 (0.382)	15.2 (0.598)	5.1 (0.201)	0.7 (0.028)	7.6 (0.30)	3.1 (0.122)	1	0.51 (0.020)	Sn/Cu				
MF-RX075/72	10.4 (0.409)	16.0 (0.630)	5.1 (0.201)	0.7 (0.028)	7.6 (0.30)	3.1 (0.122)	1	0.51 (0.020)	Sn/Cu				
MF-RX090/72	11.7 (0.461)	16.70 (0.657)	5.1 (0.201)	0.7 (0.028)	7.6 (0.30)	3.1 (0.122)	1	0.51 (0.020)	Sn/Cu				
MF-RX110/72	10.84 (0.427)	16.84 (0.662)	5.1 (0.201)	0.7 (0.028)	7.6 (0.30)	3.1 (0.122)	2	0.81 (0.032)	Sn/Cu				
MF-RX135/72	12.26 (0.483)	18.26 (0.718)	5.1 (0.201)	0.7 (0.028)	7.6 (0.30)	3.1 (0.122)	2	0.81 (0.032)	Sn/Cu				
MF-RX160/72	13.94 (0.549)	19.94 (0.785)	5.1 (0.201)	0.7 (0.028)	7.6 (0.30)	3.1 (0.122)	2	0.81 (0.032)	Sn/Cu				
MF-RX185/72	15.18 (0.598)	21.18 (0.833)	5.1 (0.201)	0.7 (0.028)	7.6 (0.30)	3.1 (0.122)	2	0.81 (0.032)	Sn/Cu				
MF-RX250/72	17.84 (0.702)	23.84 (0.938)	10.2 (0.402)	0.7 (0.028)	7.6 (0.30)	3.1 (0.122)	2	0.81 (0.032)	Sn/Cu				
MF-RX300/72	20.67 (0.814)	26.67 (1.050)	10.2 (0.402)	0.7 (0.028)	7.6 (0.30)	3.1 (0.122)	2	0.81 (0.032)	Sn/Cu				
MF-RX375/72	23.51 (0.926)	29.51 (1.161)	10.2 (0.402)	0.7 (0.028)	7.6 (0.30)	3.1 (0.122)	2	0.81 (0.032)	Sn/Cu				

### Packaging options:

BULK: 500 pcs. per bag.

TAPE & REEL: MF-RX020/72-2 ~ MF-RX090/72-2 = 3000 pcs. per reel; MF-RX110/72-2 ~ MF-RX160/72-2 = 1500 pcs. per reel;

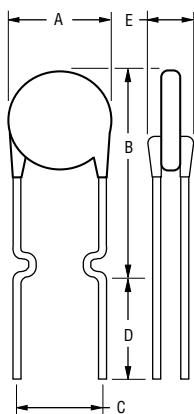
MF-RX185/72-2 - MF-RX375/72-2 = 1000 pcs. per reel.

AMMO-PACK: MF-RX020/72-AP ~ MF-RX090/72-AP = 2000 pcs. per pack; MF-RX110/72-AP ~ MF-RX160/72-AP = 1000 pcs. per pack;

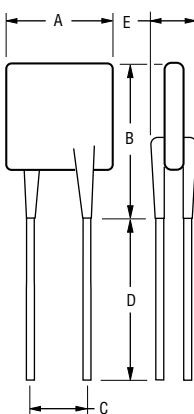
MF-RX185/72-AP - MF-RX375/72-AP = 500 pcs. per pack.

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

### Style 1



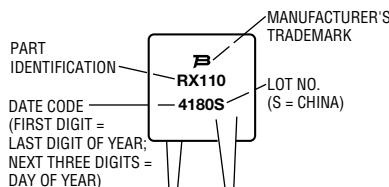
### Style 2



Also available with kinked and straight leads in place of standard leads (see How to Order).

### Typical Part Marking

Represents total content. Layout may vary.



### How to Order

**MF - RX 110/72 - 2 - 14**

Multifuse®  
Product Designator  
Series  
RX = Radial Leaded Component  
Hold Current, I<sub>hold</sub>  
020-375 (0.20 A - 3.75 A)  
Maximum Voltage, V<sub>max</sub>  
72 (72 Volts)  
Packaging Options  
- 0 = Bulk Packaging  
- 2 = Tape and Reel\*  
- AP = Ammo-Pak\*  
Part Number Suffix Option  
- 14 = Kinked Leads in Place of Standard Straight Leads  
- 17 = Straight Leads in Place of Standard Kinked Leads

\*Packaged per EIA 486-B

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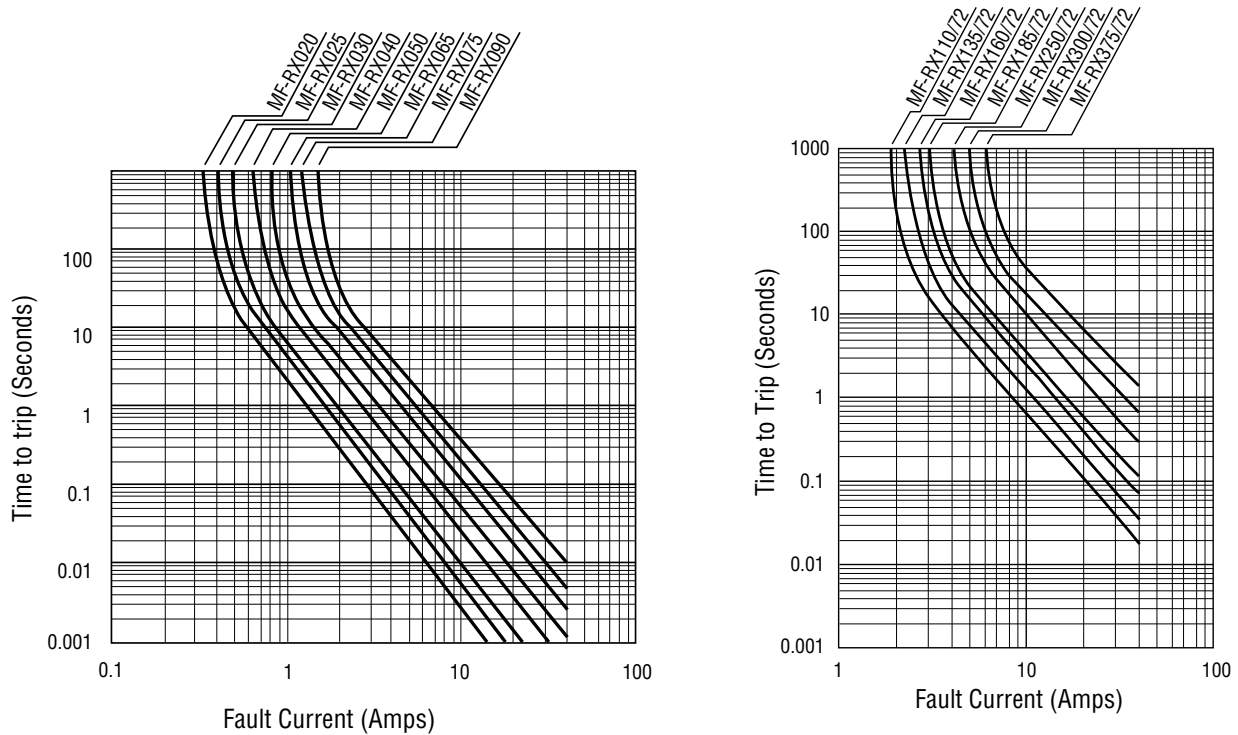
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# MF-RX/72 Series - PTC Resettable Fuses

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## 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.

## Thermal Derating Chart - I<sub>hold</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-RX020/72	0.31	0.27	0.24	0.20	0.16	0.14	0.13	0.11	0.08
MF-RX025/72	0.39	0.34	0.30	0.25	0.20	0.18	0.16	0.14	0.10
MF-RX030/72	0.47	0.41	0.36	0.30	0.24	0.22	0.19	0.16	0.12
MF-RX040/72	0.62	0.54	0.48	0.40	0.32	0.29	0.25	0.22	0.16
MF-RX050/72	0.78	0.68	0.60	0.50	0.41	0.36	0.32	0.27	0.20
MF-RX065/72	1.01	0.88	0.77	0.65	0.53	0.47	0.41	0.35	0.26
MF-RX075/72	1.16	1.02	0.89	0.75	0.61	0.54	0.47	0.41	0.30
MF-RX090/72	1.40	1.22	1.07	0.90	0.73	0.65	0.57	0.49	0.36
MF-RX110/72	1.71	1.50	1.31	1.10	0.89	0.79	0.69	0.59	0.44
MF-RX135/72	2.09	1.84	1.61	1.35	1.09	0.97	0.85	0.73	0.54
MF-RX160/72	2.48	2.18	1.90	1.60	1.30	1.15	1.01	0.86	0.64
MF-RX185/72	2.87	2.52	2.20	1.85	1.50	1.33	1.17	1.00	0.74
MF-RX250/72	3.88	3.40	2.98	2.50	2.03	1.80	1.58	1.35	1.00
MF-RX300/72	4.65	4.08	3.57	3.00	2.43	2.16	1.89	1.62	1.20
MF-RX375/72	5.81	5.10	4.46	3.75	3.04	2.70	2.36	2.03	1.50

MF-RX/72 SERIES, REV. O 03/17

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## MF-R, MF-R/90, MF-R/600, & MF-RX, & MF-RX/72 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, MF-RX020/72–MF-RX030/72			$\frac{12.7}{(0.5)}$	$\frac{\pm 0.3}{(\pm .012)}$
Device pitch: MF-R185–MF-R400, MF-R/600, MF-RX110–MF-RX375 MF-RX040/72–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, MF-RX110/72–MF-RX185/72		$t_1$	$\frac{1.5}{(.059)}$	max.
Tape thickness with splice: MF-R250–MF-R1100, 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	$\frac{\pm 1.3}{(\pm .051)}$

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

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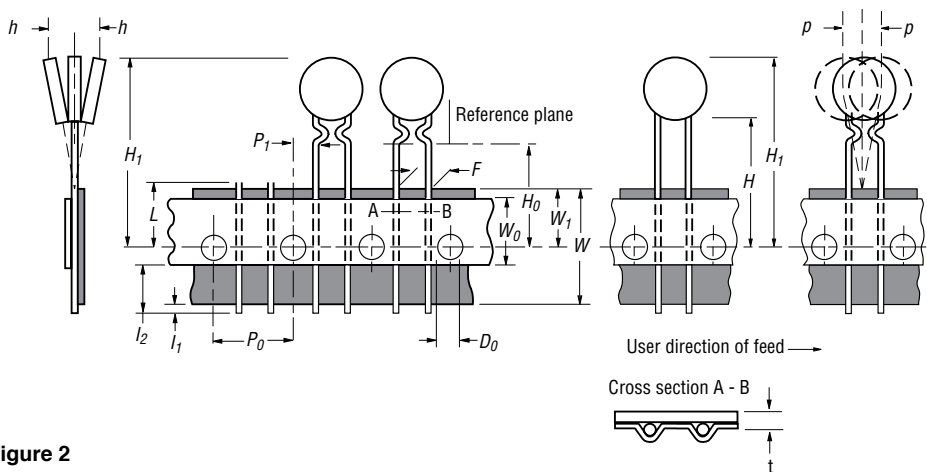
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# MF-R, MF-R/90, MF-R/600, MF-RX, & MF-RX/72 Series Tape and Reel Specifications

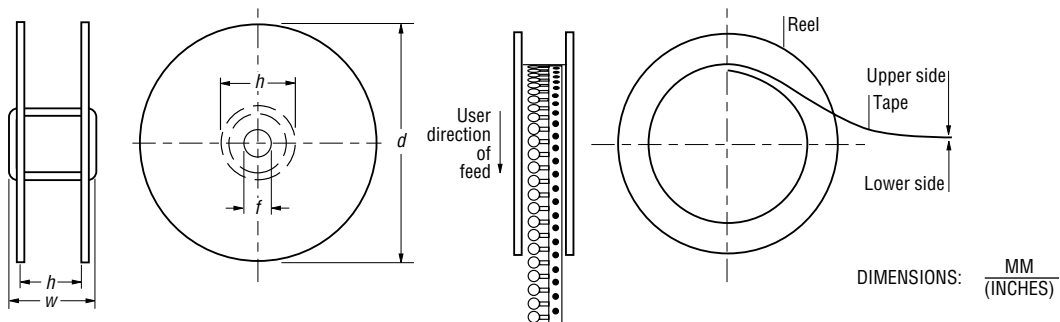
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Dimension Description	IEC Mark	EIA Mark	Dimensions	
			Dimensions	Tolerance
Lead spacing: MF-R, MF-R/90, MF-R/600, MF-RX, MF-RX/72	<i>F</i>	<i>F</i>	$\frac{5.08}{(0.2)}$	$\frac{\pm 0.2}{(\pm 0.008)}$
Reel width	<i>w</i>	<i>W<sub>2</sub></i>	$\frac{56.0}{(2.205)}$	max.
Reel diameter	<i>d</i>	<i>a</i>	$\frac{370.0}{(14.57)}$	max.
Space between flanges less device	<i>W<sub>1</sub></i>	<i>h</i>	$\frac{4.75}{(.187)}$	$\frac{\pm 3.25}{(\pm .128)}$
Arbor hole diameter	<i>f</i>	<i>c</i>	$\frac{26.0}{(1.024)}$	$\frac{\pm 12.0}{(\pm .472)}$
Core diameter: MF-R, MF-RX, MF-R/90	<i>h</i>	<i>n</i>	$\frac{80}{(3.15)}$	max.
Core diameter: MF-R/600	<i>h</i>	<i>n</i>	$\frac{91}{(3.58)}$	max.
Box: MF-R, MF-RX, MF-R/90			$\frac{62}{(2.44)}$ $\frac{355}{(14.0)}$ $\frac{345}{(13.6)}$	nom.
Box: MF-R/600			$\frac{64}{(2.52)}$ $\frac{372}{(14.6)}$ $\frac{362}{(14.25)}$	max.
Consecutive missing places: MF-R, MF-RX, MF-R/90			3	max.
Consecutive missing places: MF-R/600			none	
Empty places per reel: MF-R, MF-RX, MF-R/90			Not specified	
Empty places per reel: MF-R/600			0.1 %	

**Taped Component Dimensions -  
Figure 1**



**Reel Dimensions - Figure 2**



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**Application Notice**

- Users are responsible for independent and adequate evaluation of Bourns® Multifuse® Polymer PTC devices in the user's application, including the PPTC device characteristics stated in the applicable data sheet.
- Polymer PTC devices must not be allowed to operate beyond their stated maximum ratings. Operation in excess of such maximum ratings could result in damage to the PTC device and possibly lead to electrical arcing and/or fire. Circuits with inductance may generate a voltage above the rated voltage of the polymer PTC device and should be thoroughly evaluated within the user's application during the PTC selection and qualification process.
- Polymer PTC devices are intended to protect against adverse effects of temporary overcurrent or overtemperature conditions up to rated limits and are not intended to serve as protective devices where overcurrent or overvoltage conditions are expected to be repetitive or prolonged.
- In normal operation, polymer PTC devices experience thermal expansion under fault conditions. Thus, a polymer PTC device must be protected against mechanical stress, and must be given adequate clearance within the user's application to accommodate such thermal expansion. Rigid potting materials or fixed housings or coverings that do not provide adequate clearance should be thoroughly examined and tested by the user, as they may result in the malfunction of polymer PTC devices if the thermal expansion is inhibited.
- Exposure to lubricants, silicon-based oils, solvents, gels, electrolytes, acids, and other related or similar materials may adversely affect the performance of polymer PTC devices.
- Aggressive solvents may adversely affect the performance of polymer PTC devices. Conformal coating, encapsulating, potting, molding, and sealing materials may contain aggressive solvents including but not limited to xylene and toluene, which are known to cause adverse effects on the performance of polymer PTCs. Such aggressive solvents must be thoroughly cured or baked to ensure their complete removal from polymer PTCs to minimize the possible adverse effect on the device.
- Recommended storage conditions should be followed at all times. Such conditions can be found on the applicable data sheet and on the Multifuse® Polymer PTC Moisture/Reflow Sensitivity Classification (MSL) note:  
[https://www.bourns.com/docs/RoHS-MSL/msl\\_mf.pdf](https://www.bourns.com/docs/RoHS-MSL/msl_mf.pdf)

MFAN 12/18

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Unless Bourns has explicitly designated an individual Bourns® product as meeting the requirements of a particular industry standard (e.g., ISO/TS 16949) or a particular qualification (e.g., UL listed or recognized), Bourns is not responsible for any failure of an individual Bourns® product to meet the requirements of such industry standard or particular qualification. Users of Bourns® products are responsible for ensuring compliance with safety-related requirements and standards applicable to their devices or applications.

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