

## Features

- Radial Leaded Devices
- Maximum 600 VAC interrupt fault rating
- Available in matched resistance "bins"
- Ability to withstand lightning surges
- RoHS compliant\*, lead free
- Agency recognition:

## Applications

Customer Premise Equipment (CPE):

- Modems
- Cable modems
- Fax machines
- POS equipment
- Security equipment
- Set top boxes

# MF-R/600 Series - Telecom PTC Resettable Fuses

### Electrical Characteristics

Model	Max. Operating Voltage	Max. Interrupt Ratings		Hold Current	Trip Current	Initial Resistance		One Hour Post-Trip Resistance	Max. Time To Trip @ 1 A	Tripped Power Dissipation
		Volts	Amps			Amps at 23 °C	Amps at 23 °C			
		Max.	Max.			Min.	Max.	Max.		
MF-R015/600	60	600	3	0.15	0.30	6.0	12.0	22.0	5.0	1.0
MF-R015/600-A	60	600	3	0.15	0.30	7.0	10.0	20.0	5.0	1.0
MF-R015/600-B	60	600	3	0.15	0.30	9.0	12.0	22.0	5.0	1.0
MF-R015/600-F	60	600	3	0.15	0.30	7.0	12.0	22.0	5.0	1.0
MF-R016/600	60	600	3	0.16	0.32	4.0	10.0	18.0	7.0	1.0
MF-R016/600-A	60	600	3	0.16	0.32	4.0	7.0	16.0	7.0	1.0
MF-R016/600-1	60	600	3	0.16	0.32	4.0	8.0	17.0	7.0	1.0

### 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
	+60 °C, 1000 hours..... ±5 % typical resistance change
Humidity Aging .....	+85 °C, 85 % R.H. 500 hours..... ±5 % typical resistance change
Thermal Shock .....	MIL-STD-202F, Method 107G, ..... ±10 % typical resistance change
	+125 °C to -55 °C, 10 times ..... ±15 % typical resistance change
Solvent Resistance.....	MIL-STD-202, Method 215B ..... No change
Lead Solderability.....	ANSI/J-STD-002
Flammability .....	IEC 695-2-2 ..... No Flame for 60 secs.
Vibration .....	MIL-STD-883C, Method 2007.1, Condition A ..... No change

### Test Procedures And Requirements For Model MF-R/600 Series

Test	Test Conditions	Accept/Reject Criteria
Visual/Mech.....	Verify dimensions and materials.....	Per MF physical description
Resistance.....	In still air @ 23 °C.....	$R_{min} \leq R \leq R_{max}$
Time to Trip.....	5 times $I_{hold}$ , $V_{max}$ , 23 °C.....	$T \leq \text{max. time to trip (seconds)}$
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

UL File Number ..... E 174545S

### 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-R015/600	0.233	0.206	0.178	0.150	0.124	0.110	0.096	0.083	0.062
MF-R016/600	0.249	0.219	0.190	0.160	0.132	0.117	0.103	0.088	0.066

$I_{trip}$  is approximately two times  $I_{hold}$ .

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

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Customers should verify actual device performance in their specific applications.

## Additional Features

- Ability to withstand AC power cross conditions

# MF-R/600 Series - Telecom PTC Resettable Fuses

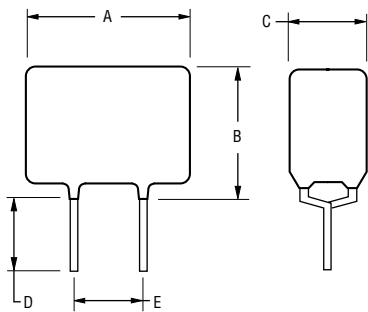
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### Product Dimensions

Model	A Max.	B Max.	C Max.	D Min.	E Nom.	Physical Characteristics		
						Style	Lead Dia.	Material
MF-R015/600	$\frac{13.5}{(0.531)}$	$\frac{12.6}{(0.496)}$	$\frac{6.0}{(0.236)}$	$\frac{4.7}{(0.185)}$	$\frac{5.0}{(0.197)}$	1	$\frac{0.65}{(0.026)}$	Sn/Cu
MF-R016/600	$\frac{16.0}{(0.629)}$	$\frac{12.6}{(0.496)}$	$\frac{6.0}{(0.236)}$	$\frac{4.7}{(0.185)}$	$\frac{5.0}{(0.197)}$	1	$\frac{0.65}{(0.026)}$	Sn/Cu

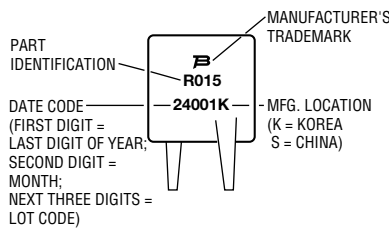
Packaging options: BULK: 500 pcs. per bag. TAPE & REEL: 600 pcs. per reel.  
Longer lead lengths available upon request.

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



### Typical Part Marking

Represents total content. Layout may vary.



### How to Order

#### MF - R 015/600 - A 05 - 2

Multifuse®  
Product  
Designator

Series  
R = Radial Ledged  
Component

Hold Current, I<sub>hold</sub>  
015-016 (0.15 - 0.16 Amps)

Max. Interrupt Voltage, V

Resistance Range

- Narrow resistance ranges are available on all models as defined in Electrical Characteristics.
- Blank = N/A

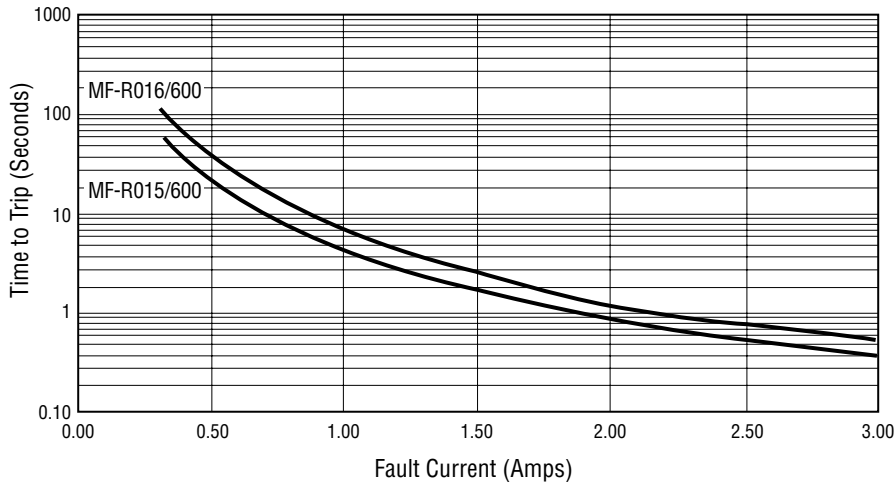
Resistance Bins

- Narrow resistance ranges can be separated into packages where each device is within 0.5 ohms of each other.
- Blank = N/A

Packaging Options  
- 0 = Bulk Packaging  
- 2 = Tape and Reel\*

\*Packaged per EIA486-B

### Typical Time to Trip at 23 °C



### Resistance Options

Model	R <sub>min.</sub>	R <sub>max.</sub>	R1 <sub>Max.</sub>	Bin
MF-R015/600	6.0	12.0	22.0	N/A
MF-R015/600-A	7.0	10.0	20.0	0.5
MF-R015/600-B	9.0	12.0	22.0	0.5
MF-R015/600-F	7.0	12.0	22.0	0.5
MF-R016/600	4.0	10.0	18.0	N/A
MF-R016/600-A	4.0	7.0	16.0	0.5
MF-R016/600-1	4.0	8.0	17.0	0.5

MF-R/600, REV. G, 12/10

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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	$I_1$	$L_1$	$\frac{1.0}{(.039)}$	max.
Protrusion of cutout	$L$	$L$	$\frac{11}{(.433)}$	max.
Protrusion beyond hold-down tape	$I_2$	$I_2$	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-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 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, 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	$\frac{\pm 1.3}{(\pm .051)}$

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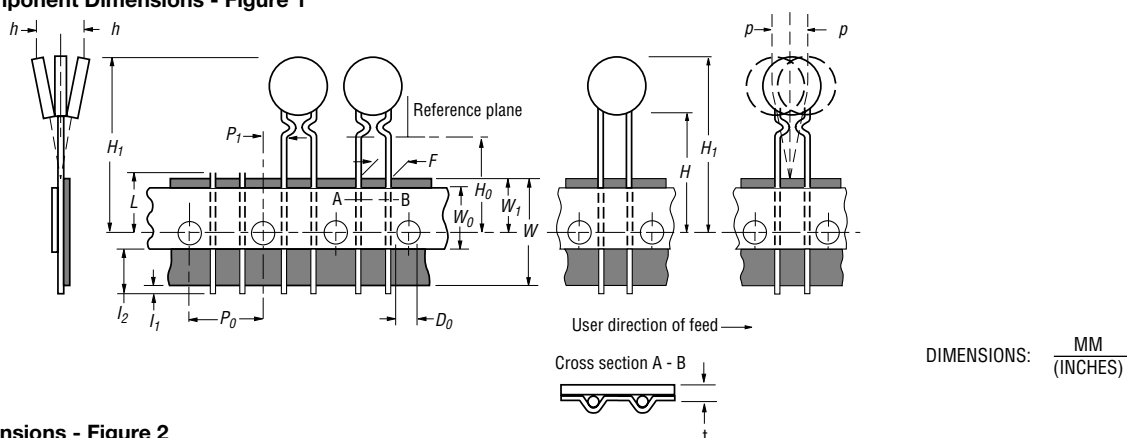
DIMENSIONS:  $\frac{\text{MM}}{\text{(INCHES)}}$

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

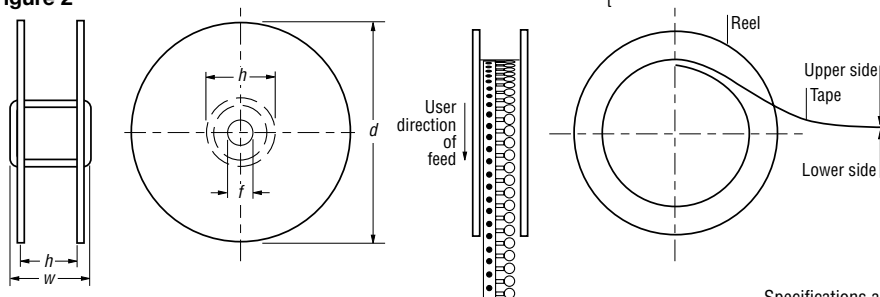
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Dimension Description	IEC Mark	EIA Mark	Dimensions			
			Dimensions	Tolerance		
Lead spacing: MF-R, MF-R/90, MF-R/600, MF-RX, MF-RX/72	F	F	5.08 (0.2)	$\pm 0.2$ ( $\pm 0.008$ )		
Lead spacing: MF-RX/250	F	F	5.08 (0.2)	$-0.5/+0.6$ ( $-0.020/+0.024$ )		
Reel width	w	W <sub>2</sub>	56.0 (2.205)	max.		
Reel diameter	d	a	370.0 (14.57)	max.		
Space between flanges less device	W <sub>1</sub>	h	4.75 (.187)	$\pm 3.25$ ( $\pm .128$ )		
Arbor hole diameter	f	c	26.0 (1.024)	$\pm 12.0$ ( $\pm .472$ )		
Core diameter: MF-R, MF-RX, MF-R/90	h	n	80 (3.15)	max.		
Core diameter: MF-RX/250, MF-R/600	h	n	91 (3.58)	max.		
Box: MF-R, MF-RX, MF-R/90			56 (2.2)	372 (14.6)	372 (14.6)	max.
Box: MF-RX/250			67 (2.64)	372 (14.6)	362 (14.25)	max.
Box: MF-R/600			64 (2.52)	372 (14.6)	362 (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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