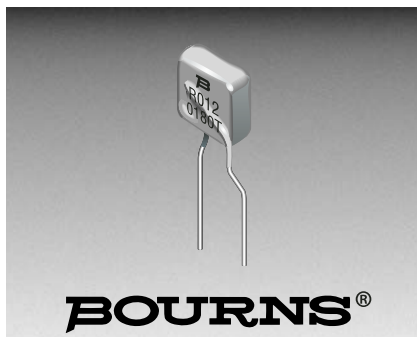




Features

- Radial Leaded Devices
- High ability to withstand lightning surges
- Ideal lightning surge coordination device
- Binned and sorted narrow resistance ranges available
- Lead free option available
- Agency recognition:   

Applications

- Customer Premise Equipment (CPE)
- Central Office / Telecom Centers (CO)
- Access equipment

MF-R/250 Series - Telecom PTC Resettable Fuses

Electrical Characteristics

Model	Max. Operating Voltage (Vdc)	Max. Interrupt Ratings		Hold Current Amps at 23 °C	Initial Resistance		One Hour Post-Trip Resistance Ohms at 23 °C
		Volts (Vrms)	Amps (A)		Ohms at 23 °C	Ohms at 23 °C	
		Max.	Max.		Min.	Max.	
MF-R008/250U	60	250	3.0	0.08	14.0	20.0	33.0
MF-R008/250	60	250	3.0	0.08	15.0	22.0	33.0
MF-R011/250U	60	250	3.0	0.11	5.0	9.0	16.0
MF-R012/250	60	250	3.0	0.12	4.0	8.0	16.0
MF-R012/250-A	60	250	3.0	0.12	7.0	9.0	16.0
MF-R012/250-C	60	250	3.0	0.12	5.5	7.5	14.0
MF-R012/250-F	60	250	3.0	0.12	6.0	10.5	16.0
MF-R012/250-1	60	250	3.0	0.12	6.0	9.0	16.0
MF-R012/250-2	60	250	3.0	0.12	8.0	10.5	16.0
MF-R012/250U	60	250	3.0	0.12	6.0	10.0	16.0
MF-R014/250	60	250	3.0	0.145	3.0	6.0	12.0
MF-R014/250-A	60	250	3.0	0.145	3.0	5.5	12.0
MF-R014/250-B	60	250	3.0	0.145	4.5	6.0	14.0
MF-R014/250U	60	250	3.0	0.145	3.5	6.5	12.0
MF-R018/250U	60	250	10.0	0.18	0.8	2.0	4.0

“U” suffix indicates product without insulation coating.

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±15 % typical resistance change
	+60°C, 1000 hours±15 % typical resistance change
Humidity Aging	+85 °C, 85 % R.H. 500 hours±15 % 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>95 % coverage
Flammability	IEC 695-2-2No Flame for 60 secs.
Vibration	MIL-STD-883C, Method 2007.1, Condition A.....±5 % typical resistance change

Test Procedures And Requirements For Model MF-R/250 Series

Test	Test Conditions	Accept/Reject Criteria
Visual/Mech.	Verify dimensions and materials.....	Per MF physical description
Resistance	In still air @ 23 °C	$R_{min} \leq R \leq R_{1max}$
Time to Trip	5 times I_{hold} , V_{max} , 23 °C.....	$T \leq$ typical 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	
CSA File Number	CA 110338	
TÜV File Number	R02057213	

Additional Features

- Assists equipment with meeting ITU-T K.20/K.21/K.45
- Assists equipment with meeting Telcordia GR-1089-C Intrabuilding

MF-R/250 Series - Telecom 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-R008/250	0.124	0.110	0.095	0.080	0.066	0.059	0.051	0.044	0.033
MF-R011/250U	0.171	0.151	0.131	0.110	0.091	0.081	0.071	0.061	0.046
MF-R012/250	0.186	0.165	0.143	0.120	0.099	0.088	0.077	0.066	0.050
MF-R014/250	0.255	0.199	0.172	0.145	0.119	0.106	0.093	0.080	0.060
MF-R018/250U	0.269	0.240	0.211	0.180	0.153	0.138	0.123	0.109	0.087

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

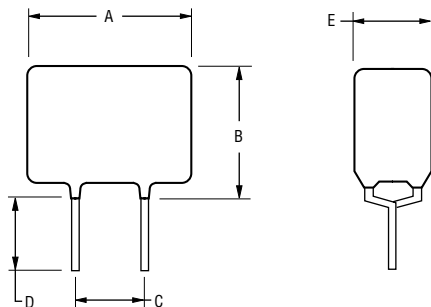
Product Dimensions

Model	A Max.	B Max.	C Max.	D Min.	E Max.	Physical Characteristics	
						Lead Dia.	Material
MF-R008/250	7.5 (0.295)	11.5 (0.453)	5.1 ± 0.7 (0.201 ± 0.028)	5.0 (0.197)	4.8 (0.189)	0.65 (0.026)	Sn/Cu
MF-R008/250U	6.2 (0.244)	11.5 (0.453)	5.1 ± 0.7 (0.201 ± 0.028)	5.0 (0.197)	3.8 (0.150)	0.65 (0.026)	Sn/Cu
MF-R011/250U	6.2 (0.244)	11.5 (0.453)	5.1 ± 0.7 (0.201 ± 0.028)	5.0 (0.197)	3.8 (0.150)	0.65 (0.026)	Sn/Cu
MF-R012/250	7.5 (0.295)	11.5 (0.453)	5.1 ± 0.7 (0.201 ± 0.028)	5.0 (0.197)	4.8 (0.189)	0.65 (0.026)	Sn/Cu
MF-R012/250U	6.2 (0.244)	11.5 (0.453)	5.1 ± 0.7 (0.201 ± 0.028)	5.0 (0.197)	3.8 (0.150)	0.65 (0.026)	Sn/Cu
MF-R014/250	7.5 (0.295)	11.5 (0.453)	5.1 ± 0.7 (0.201 ± 0.028)	5.0 (0.197)	4.8 (0.189)	0.65 (0.026)	Sn/Cu
MF-R014/250U	6.2 (0.244)	11.5 (0.453)	5.1 ± 0.7 (0.201 ± 0.028)	5.0 (0.197)	3.8 (0.150)	0.65 (0.026)	Sn/Cu
MF-R018/250U	10.4 (0.409)	12.6 (0.496)	5.1 ± 0.7 (0.201 ± 0.028)	5.0 (0.197)	3.8 (0.150)	0.65 (0.026)	Sn/Cu

Packaging options:

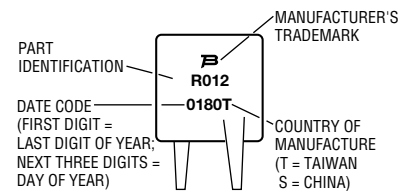
BULK: 500 pcs. per bag. TAPE & REEL: 1500 pcs. per reel (not available with binned option).

DIMENSIONS = $\frac{MM}{(INCHES)}$



Typical Part Marking

Represents total content. Layout may vary.



MF-R/250 Series - Telecom PTC Resettable Fuses

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How to Order

MF - R 012/250 U - A 05 - 2 - 99

Multifuse®
Product
Designator

Series

R = Radial Leaded
Component

Hold Current, I_{hold}
008-018
(0.08 - 0.18 Amps)

Max. Interrupt Voltage, V
250 (250 Volts)

Telecom Options

U = Uncoated (radial parts only)
T = Pre-tripped

Resistance Sorted

Narrow resistance ranges

Resistance Bins of 0.5 ohms
05 = 0.5 ohms

Packaging Options

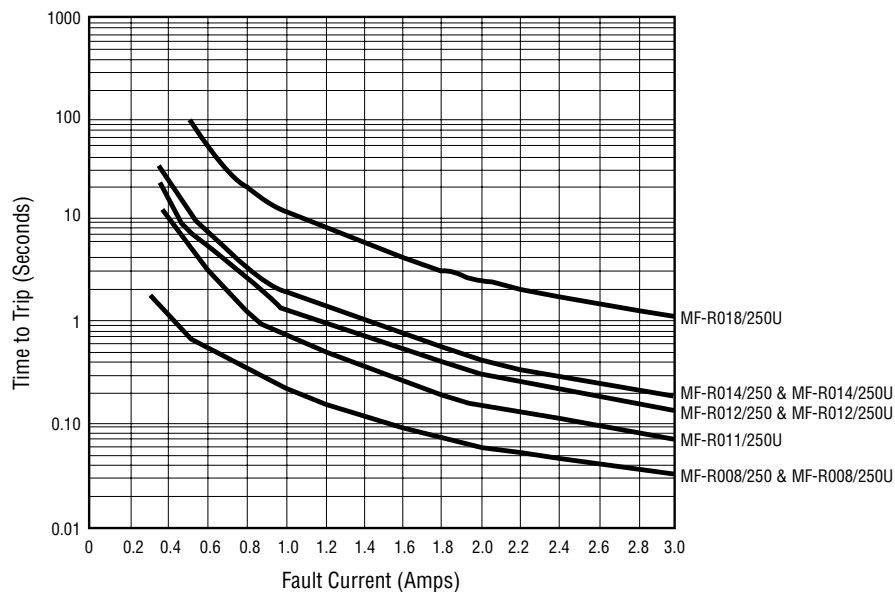
- 0 = Bulk Packaging
- 2 = Tape and Reel* (not available with binned
option)

Lead Free Option

___ = Standard Product
- 99 = Lead Free

*Packaged per EIA486-B

Typical Time to Trip at 23 °C



Resistance Options

Model	Rmin.	Rmax.	R1Max.	Bin
MF-R012/250	4.0	8.0	16.0	0.5
MF-R012/250-A05	7.0	9.0	16.0	0.5
MF-R012/250-C05	5.5	7.5	14.0	0.5
MF-R012/250-F05	6.0	10.5	16.0	0.5
MF-R012/250-105	6.0	9.0	16.0	0.5
MF-R012/250-205	8.0	10.5	16.0	0.5
MF-R012/250U	6.0	10.0	16.0	0.5
MF-R014/250	3.0	6.0	12.0	0.5
MF-R014/250-A05	3.0	5.5	12.0	0.5
MF-R014/250-B05	4.5	6.0	12.0	0.5
MF-R014/250U	3.5	6.5	12.0	0.5

MF-R, MF-RX, MF-R/90, MF-R/250, MF-RX/250 & MF-R/600 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	<i>W</i>	<i>W</i>	$\frac{18}{(.709)}$	$\frac{-0.5/+1.0}{(-0.02/+0.039)}$
Hold down tape width: MF-R/600		<i>W4</i>	$\frac{5}{(.197)}$	min.
Hold down tape width: all others		<i>W4</i>	$\frac{11}{(.433)}$	ref.
Hold down tape	<i>W0</i>		No protrusion	
Top distance between tape edges	<i>W2</i>	<i>W6</i>	$\frac{3}{(.118)}$	max.
Sprocket hole position	<i>W1</i>	<i>W5</i>	$\frac{9}{(.354)}$	$\frac{-0.5/+0.75}{(-0.02/+0.03)}$
Sprocket hole diameter	<i>D0</i>	<i>D0</i>	$\frac{4}{(.157)}$	± 0.2 ($\pm .0078$)
Abscissa to plane (straight lead)	<i>H</i>	<i>H</i>	$\frac{18.5}{(.728)}$	± 3.0 ($\pm .118$)
Abscissa to plane (kinked lead)	<i>H0</i>	<i>H0</i>	$\frac{16}{(.63)}$	± 0.5 ($\pm .02$)
Abscissa to top	<i>H1</i>	<i>H1</i>	$\frac{32.2}{(1.268)}$	max.
Overall width w/lead protrusion		<i>C1</i>	$\frac{43.2}{(1.7)}$	max.
Overall width w/o lead protrusion		<i>C2</i>	$\frac{42.5}{(1.673)}$	max.
Lead protrusion	<i>I1</i>	<i>L1</i>	$\frac{1.0}{(.039)}$	max.
Protrusion of cutout	<i>L</i>	<i>L</i>	$\frac{11}{(.433)}$	max.
Protrusion beyond hold tape	<i>I2</i>	<i>I2</i>	Not specified	
Sprocket hole pitch	<i>P0</i>	<i>P0</i>	$\frac{12.7}{(0.5)}$	$\frac{\pm 0.3}{(\pm .012)}$
Pitch tolerance			20 consecutive	± 1
Device pitch: MF-R005 – MF-R160 & MF-R/90			$\frac{12.7}{(0.5)}$	
Device pitch: MF-R185 – MF-R400 & MF-R/600			$\frac{25.4}{(1.0)}$	
Device pitch: MF-RX110 – MF-RX160			$\frac{12.7}{(0.5)}$	
Device pitch: MF-RX185 – MF-RX375			$\frac{12.7}{(0.5)}$	
Device pitch: MF-R/250 & MF-RX/250			$\frac{12.7}{(0.5)}$	
Tape thickness	<i>t</i>	<i>t</i>	$\frac{0.9}{(.035)}$	max.
Tape thickness with splice		<i>t1</i>	$\frac{2.0}{(.079)}$	max.
Splice sprocket hole alignment			0	$\frac{\pm 0.3}{(\pm .012)}$
Body lateral deviation	Δh	Δh	0	$\frac{\pm 1.0}{(\pm .039)}$
Body tape plane deviation	Δp	Δp	0	$\frac{\pm 1.3}{(\pm .051)}$
Lead seating plane deviation: MF-R/600*	$\Delta P1$	<i>P1</i>	$\frac{3.81}{(.015)}$	$\frac{\pm 0.7}{(\pm .028)}$
Lead seating plane deviation	$\Delta P1$	<i>P1</i>	0	$\frac{\pm 0.7}{(\pm .028)}$
Lead spacing	<i>F</i>	<i>F</i>	$\frac{5.08}{(0.2)}$	$\frac{\pm 0.8}{(\pm .035)}$
Reel width	<i>w</i>	<i>w</i>	$\frac{56}{(2.205)}$	max.
Reel diameter	<i>d</i>	<i>a</i>	$\frac{370}{(14.57)}$	max.
Space between flanges less device			$\frac{4.75}{(.187)}$	$\frac{\pm 3.25}{(\pm .128)}$

*Differs from EIA specification.

Specifications are subject to change without notice.

Customers should verify actual device performance in their specific applications.

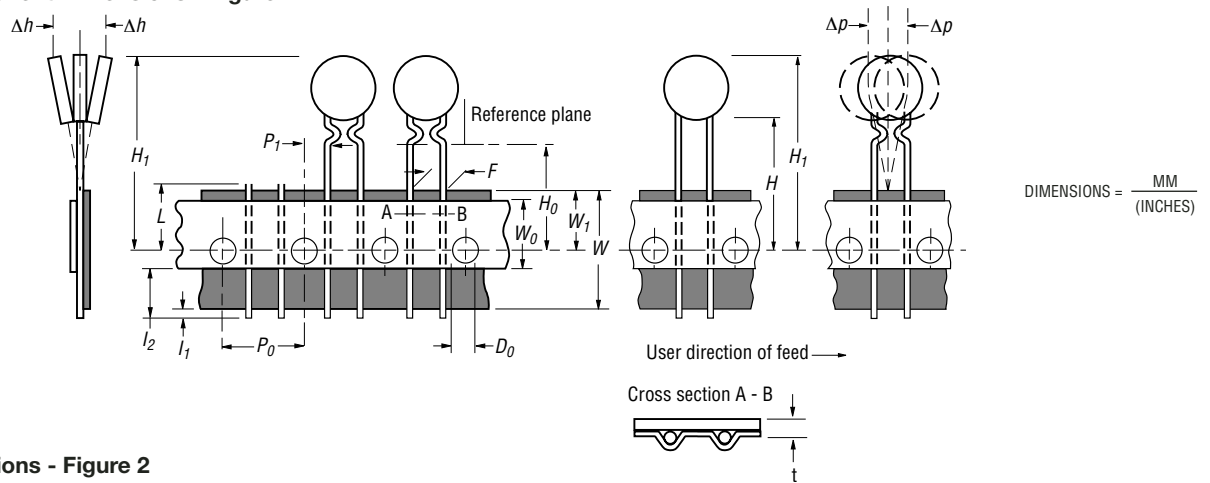
DIMENSIONS = $\frac{\text{MM}}{(\text{INCHES})}$

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

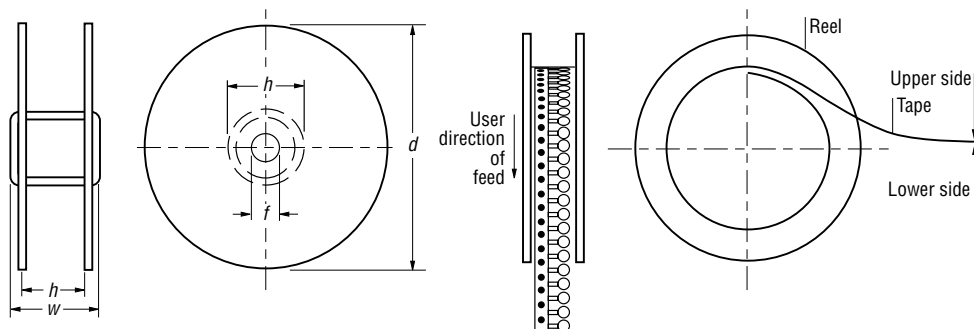
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Dimension Description	IEC Mark	EIA Mark	Dimensions	
			Dimensions	Tolerance
Space between flanges less device			$\frac{4.75}{(.187)}$	$\frac{\pm 3.25}{(\pm .128)}$
Arbor hole diameter	<i>f</i>	<i>c</i>	$\frac{26}{(1.024)}$	$\frac{\pm 12.0}{(\pm .472)}$
Core diameter: MF-R, MF-RX, MF-R/90 & MF-R/250	<i>h</i>	<i>n</i>	$\frac{80}{(3.15)}$	max.
Core diameter: MF-RX/250 & MF-R/600	<i>h</i>	<i>n</i>	$\frac{91}{(3.58)}$	max.
Box: MF-R, MF-RX, MF-R/90 & MF-R/250			$\frac{56}{(2.2)}$ $\frac{372}{(14.6)}$ $\frac{372}{(14.6)}$	max.
Box: MF-RX/250			$\frac{67}{(2.64)}$ $\frac{372}{(14.6)}$ $\frac{362}{(14.25)}$	max.
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 & MF-R/250			3	max.
Consecutive missing places: MF-RX/250 & MF-R/600			None	
Empty places per reel:				
MF-R, MF-RX, MF-R/90 & MF-R/250				Not specified
Empty places per reel: MF-RX/250 & MF-R/600			0.1 %	

Taped Component Dimensions - Figure 1



Reel Dimensions - Figure 2



Specifications are subject to change without notice.
Customers should verify actual device performance in their specific applications.