Features

- Radial Leaded Devices
- Cured, flame retardant epoxy polymer insulating material meets UL 94V-0 requirements
- RoHS compliant* and halogen free**
- Agency recognition: c UL us, TÜV

Applications

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

- Computers & peripherals
- General electronics
- Automotive applications

MF-R Series - PTC Resettable Fuses

Electrical Characteristics

Model	V max. Volts	I max. Amps	Ihold	Itrip	Initial Resistance		1 Hour (R_1) 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-R005	60	40	0.05	0.10	7.3	11.1	22.0	0.5	5.0	0.22
MF-R010	60	40	0.10	0.20	2.50	4.50	7.50	0.5	4.0	0.38
MF-R017	60	40	0.17	0.34	2.00	3.20	8.00	0.85	3.0	0.48
MF-R020	60	40	0.20	0.40	1.50	2.84	4.40	1.0	2.2	0.40
MF-R025	60	40	0.25	0.50	1.00	1.95	3.00	1.25	2.5	0.45
MF-R030	60	40	0.30	0.60	0.76	1.36	2.10	1.5	3.0	0.50
MF-R040	60	40	0.40	0.80	0.52	0.86	1.29	2.0	3.8	0.55
MF-R050	60	40	0.50	1.00	0.41	0.77	1.17	2.5	4.0	0.75
MF-R065	60	40	0.65	1.30	0.27	0.48	0.72	3.25	5.3	0.90
MF-R075	60	40	0.75	1.50	0.18	0.40	0.60	3.75	6.3	0.90
MF-R090	60	40	0.90	1.80	0.14	0.31	0.47	4.5	7.2	1.00
MF-R090-0-9	30	40	0.90	1.80	0.07	0.12	0.22	4.5	5.9	0.60
MF-R110	30	40	1.10	2.20	0.10	0.18	0.27	5.5	6.6	0.70
MF-R135	30	40	1.35	2.70	0.065	0.115	0.17	6.75	7.3	0.80
MF-R160	30	40	1.60	3.20	0.055	0.105	0.15	8.0	8.0	0.90
MF-R185	30	40	1.85	3.70	0.040	0.07	0.11	9.25	8.7	1.00
MF-R250	30	40	2.50	5.00	0.025	0.048	0.07	12.5	10.3	1.20
MF-R250-0-10	30	40	2.50	5.00	0.025	0.048	0.07	12.5	10.3	1.20
MF-R300	30	40	3.00	6.00	0.020	0.05	0.08	15.0	10.8	2.00
MF-R400	30	40	4.00	8.00	0.010	0.03	0.05	20.0	12.7	2.50
MF-R500	30	40	5.00	10.00	0.010	0.03	0.05	25.0	14.5	3.00
MF-R600	30	40	6.00	12.00	0.005	0.02	0.04	30.0	16.0	3.50
MF-R700	30	40	7.00	14.00	0.005	0.02	0.03	35.0	17.5	3.80
MF-R800	30	40	8.00	16.00	0.005	0.02	0.03	40.0	18.8	4.00
MF-R900	30	40	9.00	18.00	0.005	0.01	0.02	45.0	***20.0	4.20
MF-R1100	16	100	11.00	22.00	0.003	0.01	0.014	40.0	20.0	4.50

***Tested at 40 amps

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, Condition A ..... No change

Test Procedures And Requirements For Model MF-R Series

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

UL File Number E174545
TÜV File Number R2057213

* RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011.
** Bourns follows the prevailing definition of "halogen free" in the industry. 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.

Additional Features

■ Bulk packaging, tape and reel and Ammo-Pak available on most models

MF-R Series - PTC Resettable Fuses

BOURNS®

Product Dimensions (see next page for outline drawing)

Model	A	B	C		D	E	Physical Characteristics		
	Max.	Max.	Nom.	Tol. ±	Min.	Max.	Style	Lead Dia.	Material
MF-R005	8.0 (0.315)	8.3 (0.327)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.1 (0.122)	4	0.405 (0.016)	Sn/NiCu
MF-R010	7.4 (0.291)	12.7 (0.5)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.1 (0.122)	1	0.51 (0.020)	Sn/NiCu
MF-R017	7.4 (0.291)	12.7 (0.5)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.1 (0.122)	1	0.51 (0.020)	Sn/CuFe
MF-R020	7.4 (0.291)	12.7 (0.5)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.1 (0.122)	1	0.51 (0.020)	Sn/CuFe
MF-R025	7.4 (0.291)	12.7 (0.5)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.1 (0.122)	1	0.51 (0.020)	Sn/CuFe
MF-R030	7.4 (0.291)	13.4 (0.528)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.1 (0.122)	1	0.51 (0.020)	Sn/CuFe
MF-R040	7.4 (0.291)	13.7 (0.539)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.1 (0.122)	1	0.51 (0.020)	Sn/CuFe
MF-R050	7.9 (0.311)	13.7 (0.539)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.1 (0.122)	1	0.51 (0.020)	Sn/Cu
MF-R065	9.7 (0.382)	15.2 (0.598)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.1 (0.122)	1	0.51 (0.020)	Sn/Cu
MF-R075	10.4 (0.409)	16.0 (0.630)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.1 (0.122)	1	0.51 (0.020)	Sn/Cu
MF-R090	11.7 (0.461)	16.7 (0.657)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.1 (0.122)	1	0.51 (0.020)	Sn/Cu
MF-R090-0-9	7.4 (0.291)	12.2 (0.480)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.0 (0.118)	3	0.51 (0.020)	Sn/CuFe
MF-R110	8.9 (0.350)	14.0 (0.551)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.0 (0.118)	1	0.51 (0.020)	Sn/Cu
MF-R135	8.9 (0.350)	18.9 (0.744)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.0 (0.118)	1	0.51 (0.020)	Sn/Cu
MF-R160	10.2 (0.402)	16.8 (0.661)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.0 (0.118)	1	0.51 (0.020)	Sn/Cu
MF-R185	12.0 (0.472)	18.4 (0.724)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.0 (0.118)	1	0.51 (0.020)	Sn/Cu
MF-R250	12.0 (0.472)	18.3 (0.720)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.0 (0.118)	2	0.81 (0.032)	Sn/Cu
MF-R250-0-10	12.0 (0.472)	18.3 (0.720)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.0 (0.118)	3	0.51 (0.020)	Sn/CuFe
MF-R300	12.0 (0.472)	18.3 (0.720)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.0 (0.118)	2	0.81 (0.032)	Sn/Cu
MF-R400	14.4 (0.567)	24.8 (0.976)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.0 (0.118)	2	0.81 (0.032)	Sn/Cu
MF-R500	17.4 (0.685)	24.9 (0.980)	10.2 (0.402)	0.7 (0.028)	7.6 (0.299)	3.0 (0.118)	2	0.81 (0.032)	Sn/Cu
MF-R600	19.3 (0.760)	31.9 (1.256)	10.2 (0.402)	0.7 (0.028)	7.6 (0.299)	3.0 (0.118)	2	0.81 (0.032)	Sn/Cu
MF-R700	22.1 (0.870)	29.8 (1.173)	10.2 (0.402)	0.7 (0.028)	7.6 (0.299)	3.0 (0.118)	2	0.81 (0.032)	Sn/Cu
MF-R800	24.2 (0.953)	32.9 (1.295)	10.2 (0.402)	0.7 (0.028)	7.6 (0.299)	3.0 (0.118)	2	0.81 (0.032)	Sn/Cu
MF-R900	24.2 (0.953)	32.9 (1.295)	10.2 (0.402)	0.7 (0.028)	7.6 (0.299)	3.0 (0.118)	2	0.81 (0.032)	Sn/Cu
MF-R1100	24.2 (0.953)	32.9 (1.295)	10.2 (0.402)	0.7 (0.028)	7.6 (0.299)	3.0 (0.118)	2	0.81 (0.032)	Sn/Cu

Packaging options:

BULK: All models = 500 pcs. per bag

TAPE & REEL: MF-R005-MF-R160 12.7 mm device pitch = 3000 pcs. per reel
MF-R185-MF-R400 25.4 mm device pitch = 1500 pcs. per reel
MF-R500~MF-R1100 25.4 mm device pitch = 1000 pcs. per reel

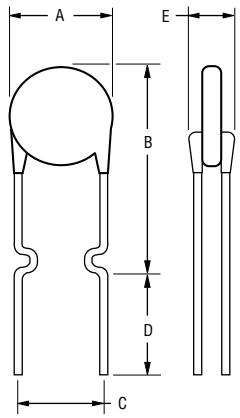
AMMO-PACK: MF-R005-MF-R160 12.7 mm device pitch = 2000 pcs. per pack
MF-R185-MF-R400 25.4 mm device pitch = 1000 pcs. per pack
MF-R500~MF-R1100 25.4 mm device pitch = 500 pcs. per pack

0.405 (26AWG)
0.51 (24AWG)
0.81 (20AWG)

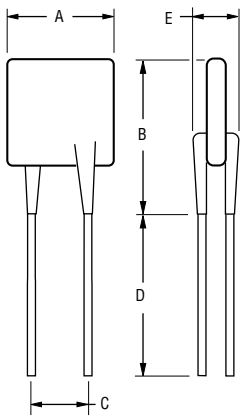
DIMENSIONS: MM / (INCHES)

Product Dimensions (see previous page for dimensions)

Style 1

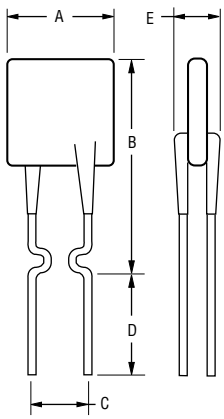


Style 2



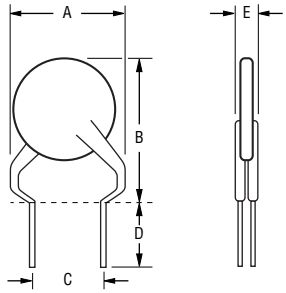
NOTE: Kinked lead option is available for board standoff. Contact factory for details.

Style 3



NOTE: Also available with straight leads. Contact factory for details.

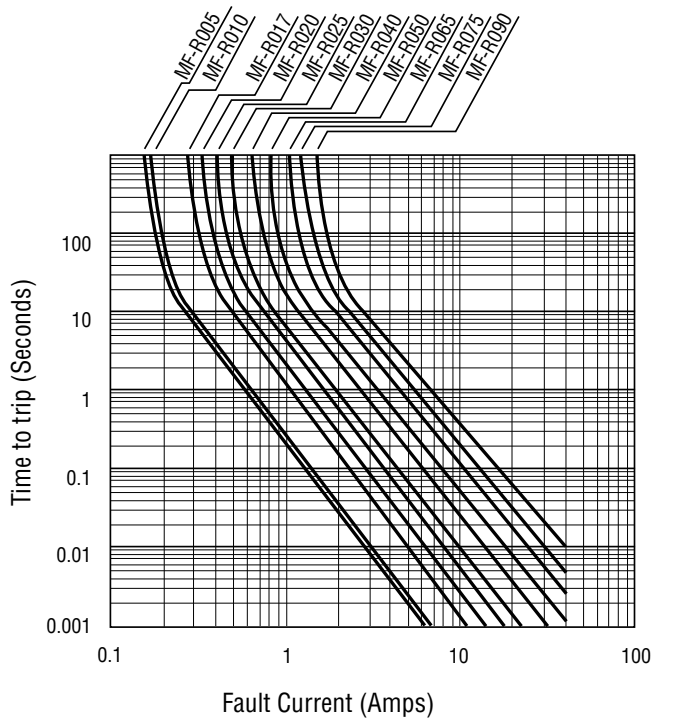
Style 4

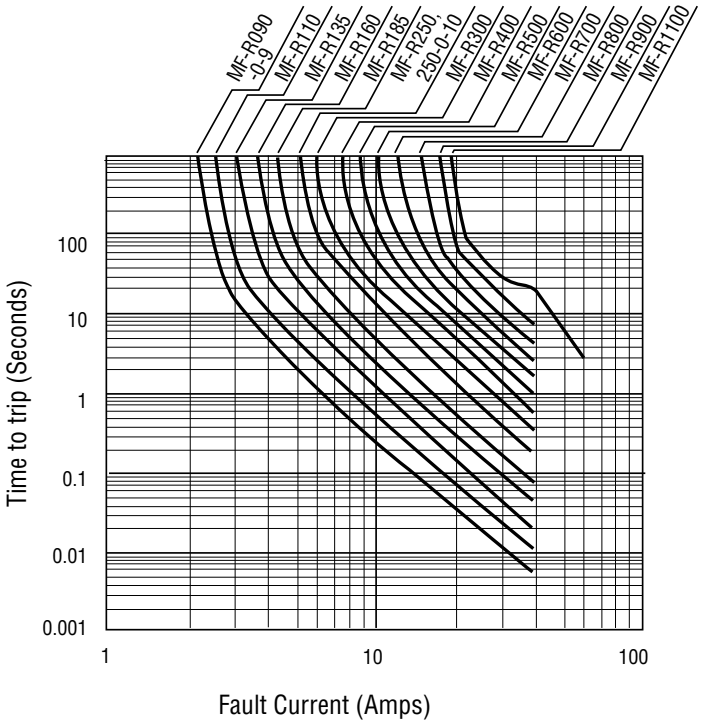


Thermal Derating Chart - I_{hold} / I_{trip} (Amps)

Model	Ambient Operating Temperature								
	-40 °C	-20 °C	0 °C	23 °C	40 °C	50 °C	60 °C	70 °C	85 °C
MF-R005	0.08 / 0.16	0.07 / 0.14	0.06 / 0.12	0.05 / 0.10	0.04 / 0.08	0.04 / 0.08	0.03 / 0.07	0.03 / 0.07	0.02 / 0.05
MF-R010	0.16 / 0.32	0.14 / 0.28	0.12 / 0.24	0.10 / 0.20	0.08 / 0.16	0.07 / 0.14	0.06 / 0.12	0.05 / 0.10	0.04 / 0.08
MF-R017	0.26 / 0.52	0.23 / 0.46	0.20 / 0.40	0.17 / 0.34	0.14 / 0.28	0.12 / 0.24	0.11 / 0.22	0.09 / 0.18	0.07 / 0.14
MF-R020	0.31 / 0.62	0.27 / 0.54	0.24 / 0.48	0.20 / 0.40	0.16 / 0.32	0.14 / 0.28	0.13 / 0.26	0.11 / 0.22	0.08 / 0.16
MF-R025	0.39 / 0.78	0.34 / 0.68	0.30 / 0.60	0.25 / 0.50	0.20 / 0.40	0.18 / 0.36	0.16 / 0.32	0.14 / 0.28	0.10 / 0.20
MF-R030	0.47 / 0.94	0.41 / 0.82	0.36 / 0.72	0.30 / 0.60	0.24 / 0.48	0.22 / 0.44	0.19 / 0.38	0.16 / 0.32	0.12 / 0.24
MF-R040	0.62 / 1.24	0.54 / 1.08	0.48 / 0.96	0.40 / 0.80	0.32 / 0.64	0.29 / 0.58	0.25 / 0.50	0.22 / 0.44	0.16 / 0.32
MF-R050	0.78 / 1.56	0.68 / 1.36	0.60 / 1.20	0.50 / 1.00	0.41 / 0.82	0.36 / 0.72	0.32 / 0.64	0.27 / 0.54	0.20 / 0.40
MF-R065	1.01 / 2.02	0.88 / 1.76	0.77 / 1.54	0.65 / 1.30	0.53 / 1.06	0.47 / 0.94	0.41 / 0.82	0.35 / 0.70	0.26 / 0.52
MF-R075	1.16 / 2.32	1.02 / 2.04	0.89 / 1.78	0.75 / 1.50	0.61 / 1.22	0.54 / 1.08	0.47 / 0.94	0.41 / 0.82	0.30 / 0.60
MF-R090	1.40 / 2.80	1.22 / 2.44	1.07 / 2.14	0.90 / 1.80	0.73 / 1.46	0.65 / 1.30	0.57 / 1.14	0.49 / 0.98	0.36 / 0.72
MF-R090-0-9	1.40 / 2.80	1.22 / 2.44	1.07 / 2.14	0.90 / 1.80	0.73 / 1.46	0.65 / 1.30	0.57 / 1.14	0.49 / 0.98	0.36 / 0.72
MF-R110	1.60 / 3.20	1.43 / 2.86	1.27 / 2.54	1.10 / 2.20	0.91 / 1.82	0.85 / 1.70	0.75 / 1.50	0.67 / 1.34	0.57 / 1.14
MF-R135	1.96 / 3.92	1.76 / 3.52	1.55 / 3.10	1.35 / 2.70	1.12 / 2.24	1.04 / 2.08	0.92 / 1.84	0.82 / 1.64	0.70 / 1.40
MF-R160	2.32 / 4.64	2.08 / 4.16	1.84 / 3.68	1.60 / 3.20	1.33 / 2.66	1.23 / 2.46	1.09 / 2.18	0.98 / 1.96	0.83 / 1.66
MF-R185	2.68 / 5.36	2.41 / 4.82	2.13 / 4.26	1.85 / 3.70	1.54 / 3.08	1.42 / 2.84	1.26 / 2.52	1.13 / 2.26	0.96 / 1.92
MF-R250	3.63 / 7.26	3.25 / 6.50	2.88 / 5.76	2.50 / 5.00	2.08 / 4.16	1.93 / 3.86	1.70 / 3.40	1.53 / 3.06	1.30 / 2.60
MF-R250-0-10	3.63 / 7.26	3.25 / 6.50	2.88 / 5.76	2.50 / 5.00	2.08 / 4.16	1.93 / 3.86	1.70 / 3.40	1.53 / 3.06	1.30 / 2.60
MF-R300	4.35 / 8.70	3.90 / 7.80	3.45 / 6.90	3.00 / 6.00	2.49 / 4.98	2.31 / 4.62	2.04 / 4.08	1.83 / 3.66	1.56 / 3.12
MF-R400	5.80 / 11.6	5.20 / 10.4	4.60 / 9.20	4.00 / 8.00	3.32 / 6.64	3.08 / 6.16	2.72 / 5.44	2.44 / 4.88	2.08 / 4.16
MF-R500	7.25 / 14.5	6.50 / 13.0	5.75 / 11.5	5.00 / 10.0	4.15 / 8.30	3.85 / 7.70	3.40 / 6.80	3.05 / 6.10	2.60 / 5.20
MF-R600	8.70 / 17.4	7.80 / 15.6	6.90 / 13.8	6.00 / 12.0	4.98 / 9.96	4.62 / 9.24	4.08 / 8.16	3.66 / 7.32	3.12 / 6.24
MF-R700	10.1 / 20.3	9.10 / 18.2	8.05 / 16.1	7.00 / 14.0	5.81 / 11.6	5.39 / 10.7	4.76 / 9.52	4.27 / 9.44	3.64 / 7.28
MF-R800	11.6 / 23.2	10.4 / 20.8	9.20 / 18.4	8.00 / 16.0	6.64 / 13.2	6.16 / 12.3	5.44 / 10.8	4.88 / 9.76	4.16 / 8.32
MF-R900	13.0 / 26.1	11.7 / 23.4	10.3 / 20.7	9.00 / 18.0	7.47 / 14.9	6.93 / 12.7	6.12 / 12.2	5.49 / 10.9	4.68 / 9.36
MF-R1100	16.1 / 32.0	14.6 / 29.2	13.1 / 26.2	11.0 / 22.1	9.40 / 18.4	8.80 / 17.6	7.80 / 15.6	6.90 / 13.8	5.20 / 10.4

Typical Time to Trip at 23 °C





How to Order

MF - R 110 - 0 - 99

Multifuse® Product Designator

Series
R = Radial Leaded Component

Hold Current, I_{hold}
005-1100 (0.05 Amps - 11.0 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

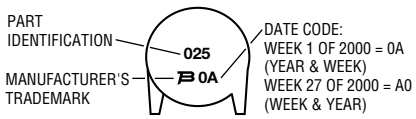
Part Number Suffix Option
- 99 = As of date code April 1, 2005 all MF-R models are RoHS compliant. The suffix "-99" can be used if a new part number is required to reference the RoHS compliance.

Examples:
- MF-R110.....Bulk packaging
- MF-R110-0-99.....Bulk packaging with part number suffix option
- MF-R110-2.....Tape and reel packaging
- MF-R110-2-99.....Tape and reel packaging with part number suffix option
- MF-R090-0-9-99.....Bulk packaging with part number suffix option
- MF-R250-0-10-99....Bulk packaging with part number suffix option

*Packaged per EIA486-B

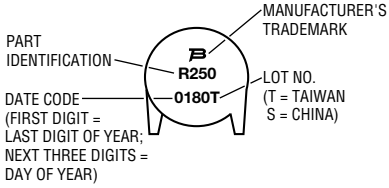
Typical Part Marking: MF-R005 - R025

Represents total content. Layout may vary.



Typical Part Marking: MF-R030 - R1100

Represents total content. Layout may vary.



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

BOURNS®

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

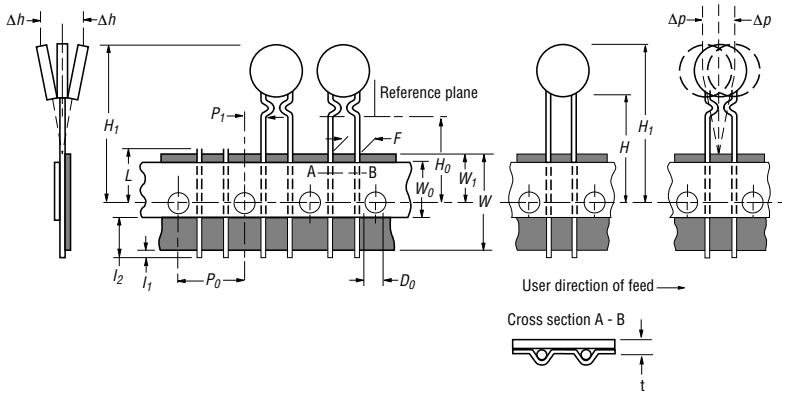
DIMENSIONS: MM (INCHES)

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

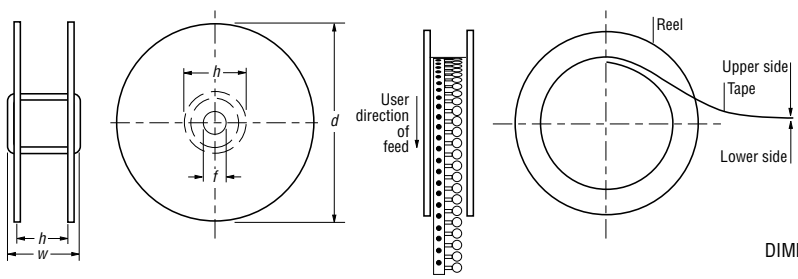
BOURNS®

Dimension Description	IEC Mark	EIA Mark	Dimensions	Tolerance
Lead spacing: MF-R, MF-R/90, MF-R/600, MF-RX, MF-RX/72	*F*	*F*	5.08 (0.2)	±0.2 (±0.008)
Lead spacing: MF-RX/250	*F*	*F*	5.08 (0.2)	-0.5/+0.6 (-.020/+.024)
Reel width	*w*	W_2	56.0 (2.205)	max.
Reel diameter	*d*	*a*	370.0 (14.57)	max.
Space between flanges less device	W_1	*h*	4.75 (.187)	±3.25 (±.128)
Arbor hole diameter	*f*	*c*	26.0 (1.024)	±12.0 (±.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			62 (2.44) 355 (14.0) 345 (13.6)	nom.
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



DIMENSIONS: MM (INCHES)