



## Features

- Compliant with AEC-Q200 Rev-C- Stress Test Qualification for Passive Components in Automotive Applications
- Operating temperature range up to 125 °C
- Low thermal derating factor
- Higher hold currents at elevated temperature
- Choice of operating currents
- RoHS compliant\* and halogen free\*\*
- Resettable fault protection of general electronic equipment

## MF-RHT Series - High Temperature PTC Resettable Fuses

### Electrical Characteristics

Model	V max. Volts	I max. Amps	I <sub>hold</sub>	I <sub>trip</sub>	Resistance		Max. Time To Trip		Tripped Power Dissipation
			Amperes at 23 °C		Ohms at 23 °C		Amperes at 23 °C	Seconds at 23 °C	Watts at 23 °C
			Hold	Trip	R <sub>Min.</sub>	R <sub>1Max.</sub> (Post Trip)		Max.	Typ.
MF-RHT050	30	40	0.5	0.92	0.4800	1.10	2.5	2.5	0.9
MF-RHT070	16	40	0.7	1.4	0.3000	0.80	3.5	4.0	1.4
MF-RHT100	30	40	1.0	1.8	0.1800	0.43	5.0	5.2	1.4
MF-RHT200	16	100	2.0	3.8	0.0450	0.110	12.5	3.0	1.4
MF-RHT200/32	32	50	2.0	3.8	0.0450	0.110	12.5	3.0	1.4
MF-RHT300	16	100	3.0	6.0	0.0330	0.079	15.0	5.0	3.0
MF-RHT400	16	100	4.0	7.5	0.0240	0.060	20.0	5.0	3.3
MF-RHT450	16	100	4.5	7.8	0.0220	0.054	22.5	3.0	3.6
MF-RHT500	16	100	5.0	9.0	0.0175	0.045	25.0	9.0	3.6
MF-RHT550	16	100	5.5	10.0	0.0150	0.037	27.5	6.0	3.5
MF-RHT600	16	100	6.0	10.8	0.0130	0.0215	30.0	5.0	4.1
MF-RHT650	16	100	6.5	12.0	0.0110	0.026	32.5	5.5	4.3
MF-RHT700	16	100	7.0	13.0	0.0100	0.025	35.0	7.0	4.0
MF-RHT750	16	100	7.5	13.1	0.0094	0.022	37.5	7.0	4.5
MF-RHT800	16	100	8.0	15.0	0.0080	0.020	40.0	8.0	4.2
MF-RHT900	16	100	9.0	16.5	0.0074	0.017	45.0	10.0	5.0
MF-RHT1000	16	100	10.0	18.5	0.0062	0.015	50.0	9.0	5.3
MF-RHT1100	16	100	11.0	20.0	0.0055	0.013	55.0	11.0	5.5
MF-RHT1300	16	100	13.0	24.0	0.0041	0.010	60.0	13.0	6.9

### Environmental Characteristics

Operating Temperature.....	-40 °C to +125 °C
Storage Temperature.....	-40 °C to +85 °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.....	MIL-STD-202, Method 107..... ±10 % typical resistance change
	+125 °C to -40 °C, 10 cycles
Vibration.....	MIL-STD-883C, Method 2007.1..... No change
	Condition A
Moisture Sensitivity Level (MSL).....	Level 1
ESD Classification - HBM.....	Class 6

### Test Procedures And Requirements For Model MF-RHT 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>1max</sub>
Time to Trip.....	At specified current, 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
Solderability.....	MIL-STD-202, Method 208.....	95 % min. coverage

\* RoHS Directive 2015/863, Mar 31, 2015 and Annex.

\*\* 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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## Applications

- Protection of automotive circuitry including engine control modules
- Overcurrent surge protection of electronic equipment required to operate at high operating temperature ranges
- Resettable fault protection of general electronic equipment

## MF-RHT Series - High Temperature 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	125 °C
MF-RHT050	0.68	0.62	0.56	0.5	0.44	0.4	0.36	0.34	0.28	0.12
MF-RHT070	0.95	0.87	0.79	0.7	0.62	0.56	0.51	0.47	0.39	0.17
MF-RHT100	1.36	1.24	1.13	1.0	0.89	0.80	0.73	0.67	0.56	0.24
MF-RHT200	2.71	2.49	2.26	2.00	1.77	1.60	1.46	1.34	1.11	0.49
MF-RHT200/32	2.71	2.49	2.26	2.00	1.77	1.60	1.46	1.34	1.11	0.49
MF-RHT300	4.07	3.74	3.41	3.00	2.65	2.40	2.21	2.00	1.66	0.74
MF-RHT400	5.57	5.11	4.65	4.00	3.62	3.29	3.01	2.73	2.27	1.01
MF-RHT450	6.1	5.6	5.1	4.5	4.0	3.6	3.3	3.0	2.5	1.1
MF-RHT500	6.78	6.22	5.67	5.0	4.44	4	3.67	3.33	2.78	1.22
MF-RHT550	7.47	6.86	6.24	5.5	4.85	4.41	4.04	3.66	3.05	1.36
MF-RHT600	8.20	7.50	6.80	6.0	5.3	4.9	4.4	4	3.3	1.5
MF-RHT650	8.8	8.1	7.4	6.5	5.7	5.3	4.8	4.3	3.6	1.6
MF-RHT700	9.51	8.73	7.95	7.0	6.17	5.61	5.15	4.66	3.88	1.73
MF-RHT750	10.2	9.4	8.6	7.5	6.6	6.1	5.6	5.0	4.1	1.9
MF-RHT800	10.87	9.98	9.08	8.0	7.06	6.41	5.88	5.33	4.43	1.97
MF-RHT900	12.21	11.19	10.16	9.0	7.97	7.20	6.56	6.04	5.01	2.19
MF-RHT1000	13.6	12.5	11.4	10.0	8.8	8.10	7.40	6.60	5.50	2.5
MF-RHT1100	14.94	13.72	12.49	11.0	9.7	8.82	8.09	7.32	6.09	2.71
MF-RHT1300	17.7	16.3	14.8	13.0	11.4	10.5	9.6	8.6	7.2	3.3

### How to Order

**MF - RHT 200 /32 - - 14**

Multifuse® Product Designator \_\_\_\_\_

Series \_\_\_\_\_  
 RHT = High Temperature Radial Leaded Component

Hold Current,  $I_{hold}$  \_\_\_\_\_  
 050 - 1300 (0.50 - 13.00 Amps)

Higher Voltage Option \_\_\_\_\_  
 Blank = Standard Voltage  
 /32 = 32 Volts

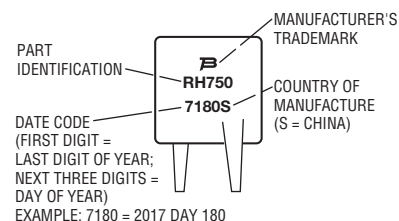
Packaging Options \_\_\_\_\_  
 Blank = Bulk Packaging  
 - 2 = Tape & Reel\*  
 - AP = Ammo-Pak\*

Part Number Suffix Option \_\_\_\_\_  
 - 14 = Kinked Leads in Place of Std. Straight Leads  
 - 17 = Straight Leads in Place of Std. Kinked Leads

\*Packaged per EIA 486-B

### Typical Part Marking

Represents total content. Layout may vary.



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# MF-RHT Series - High Temperature PTC Resettable Fuses

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## Product Dimensions

Model	A	B	C		D	E	F	Physical Characteristics	
	Max.	Max.	Nom.	Tol. ±	Min.	Max.	Nom.	Style	Material
MF-RHT050	$\frac{7.40}{(0.291)}$	$\frac{12.7}{(0.500)}$	$\frac{5.1}{(0.201)}$	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.30)}$	$\frac{3.0}{(0.12)}$	$\frac{0.51}{(0.020)}$	3	Sn/CuFe
MF-RHT070	$\frac{6.86}{(0.27)}$	$\frac{10.8}{(0.425)}$	$\frac{5.1}{(0.201)}$	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.30)}$	$\frac{3.0}{(0.12)}$	$\frac{0.51}{(0.020)}$	1	Sn/CuFe
MF-RHT100	$\frac{9.70}{(0.382)}$	$\frac{13.6}{(0.535)}$	$\frac{5.1}{(0.201)}$	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.30)}$	$\frac{3.0}{(0.12)}$	$\frac{0.51}{(0.020)}$	3	Sn/CuFe
MF-RHT200	$\frac{9.4}{(0.37)}$	$\frac{14.0}{(0.55)}$	$\frac{5.1}{(0.201)}$	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.30)}$	$\frac{3.0}{(0.12)}$	$\frac{0.51}{(0.020)}$	3	Sn/CuFe
MF-RHT200/32	$\frac{9.4}{(0.37)}$	$\frac{14.0}{(0.55)}$	$\frac{5.1}{(0.201)}$	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.30)}$	$\frac{3.0}{(0.12)}$	$\frac{0.51}{(0.020)}$	3	Sn/CuFe
MF-RHT300	$\frac{8.80}{(0.35)}$	$\frac{13.8}{(0.55)}$	$\frac{5.1}{(0.201)}$	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.30)}$	$\frac{3.0}{(0.12)}$	$\frac{0.81}{(0.032)}$	2	Sn/Cu
MF-RHT400	$\frac{10.0}{(0.394)}$	$\frac{15.0}{(0.591)}$	$\frac{5.1}{(0.201)}$	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.30)}$	$\frac{3.0}{(0.12)}$	$\frac{0.81}{(0.032)}$	2	Sn/Cu
MF-RHT450	$\frac{10.4}{(0.41)}$	$\frac{15.6}{(0.61)}$	$\frac{5.1}{(0.201)}$	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.30)}$	$\frac{3.0}{(0.12)}$	$\frac{0.81}{(0.032)}$	2	Sn/Cu
MF-RHT500	$\frac{11.2}{(0.441)}$	$\frac{18.9}{(0.744)}$	$\frac{5.1}{(0.201)}$	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.30)}$	$\frac{3.0}{(0.12)}$	$\frac{0.81}{(0.032)}$	2	Sn/Cu
MF-RHT550	$\frac{11.2}{(0.441)}$	$\frac{18.9}{(0.744)}$	$\frac{5.1}{(0.201)}$	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.30)}$	$\frac{3.0}{(0.12)}$	$\frac{0.81}{(0.032)}$	2	Sn/Cu
MF-RHT600	$\frac{11.2}{(0.441)}$	$\frac{21.0}{(0.827)}$	$\frac{5.1}{(0.201)}$	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.30)}$	$\frac{3.0}{(0.12)}$	$\frac{0.81}{(0.032)}$	2	Sn/Cu
MF-RHT650	$\frac{12.7}{(0.50)}$	$\frac{22.2}{(0.88)}$	$\frac{5.1}{(0.201)}$	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.30)}$	$\frac{3.0}{(0.12)}$	$\frac{0.81}{(0.032)}$	2	Sn/Cu
MF-RHT700	$\frac{14.0}{(0.55)}$	$\frac{21.9}{(0.862)}$	$\frac{5.1}{(0.201)}$	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.30)}$	$\frac{3.0}{(0.12)}$	$\frac{0.81}{(0.032)}$	2	Sn/Cu
MF-RHT750	$\frac{14.0}{(0.55)}$	$\frac{23.5}{(0.93)}$	$\frac{5.1}{(0.201)}$	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.30)}$	$\frac{3.0}{(0.12)}$	$\frac{0.81}{(0.032)}$	2	Sn/Cu
MF-RHT800	$\frac{16.5}{(0.65)}$	$\frac{22.5}{(0.88)}$	$\frac{5.1}{(0.201)}$	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.30)}$	$\frac{3.0}{(0.12)}$	$\frac{0.81}{(0.032)}$	2	Sn/Cu
MF-RHT900	$\frac{16.5}{(0.65)}$	$\frac{25.7}{(1.012)}$	$\frac{5.1}{(0.201)}$	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.30)}$	$\frac{3.0}{(0.12)}$	$\frac{0.81}{(0.032)}$	2	Sn/Cu
MF-RHT1000	$\frac{17.5}{(0.689)}$	$\frac{26.7}{(0.51)}$	$\frac{10.2}{(0.402)}$	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.30)}$	$\frac{3.0}{(0.12)}$	$\frac{0.81}{(0.032)}$	2	Sn/Cu
MF-RHT1100	$\frac{21.0}{(0.65)}$	$\frac{26.1}{(0.88)}$	$\frac{10.2}{(0.402)}$	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.30)}$	$\frac{3.0}{(0.12)}$	$\frac{0.81}{(0.032)}$	2	Sn/Cu
MF-RHT1300	$\frac{23.5}{(0.925)}$	$\frac{28.7}{(1.17)}$	$\frac{10.2}{(0.402)}$	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.30)}$	$\frac{3.6}{(0.14)}$	$\frac{1.0}{(0.040)}$	2	Sn/Cu

### Packaging:

BULK: MF-RHT050~MF-RHT800 = 500 pcs. per bag; MF-RHT900~MF-RHT1300 = 250 pcs. per bag

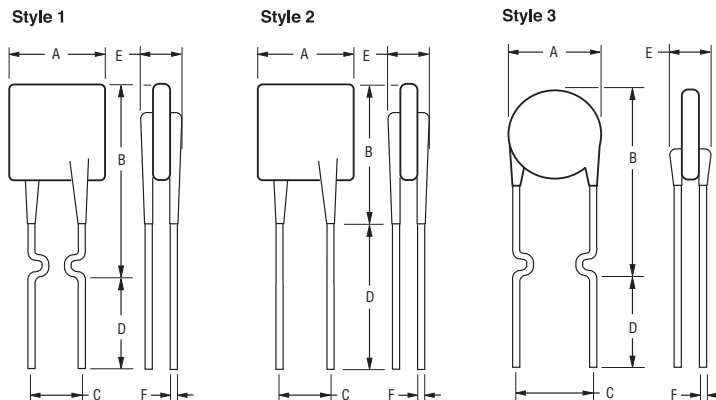
TAPE & REEL: MF-RHT050~MF-RHT400 = 3000 pcs. per reel; MF-RHT450~MF-RHT700 = 1500 pcs. per reel;

MF-RHT750~MF-RHT1300 = 1000 pcs. per reel

AMMO-PACK: MF-RHT050~MF-RHT400 = 2000 pcs. per pack; MF-RHT450~MF-RHT900 = 1000 pcs. per pack, MF-RHT1000~MF-RHT1300 = 500 pcs. per pack

0.51 (24AWG)  
0.81 (20AWG)  
1.0 (18AWG)

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



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

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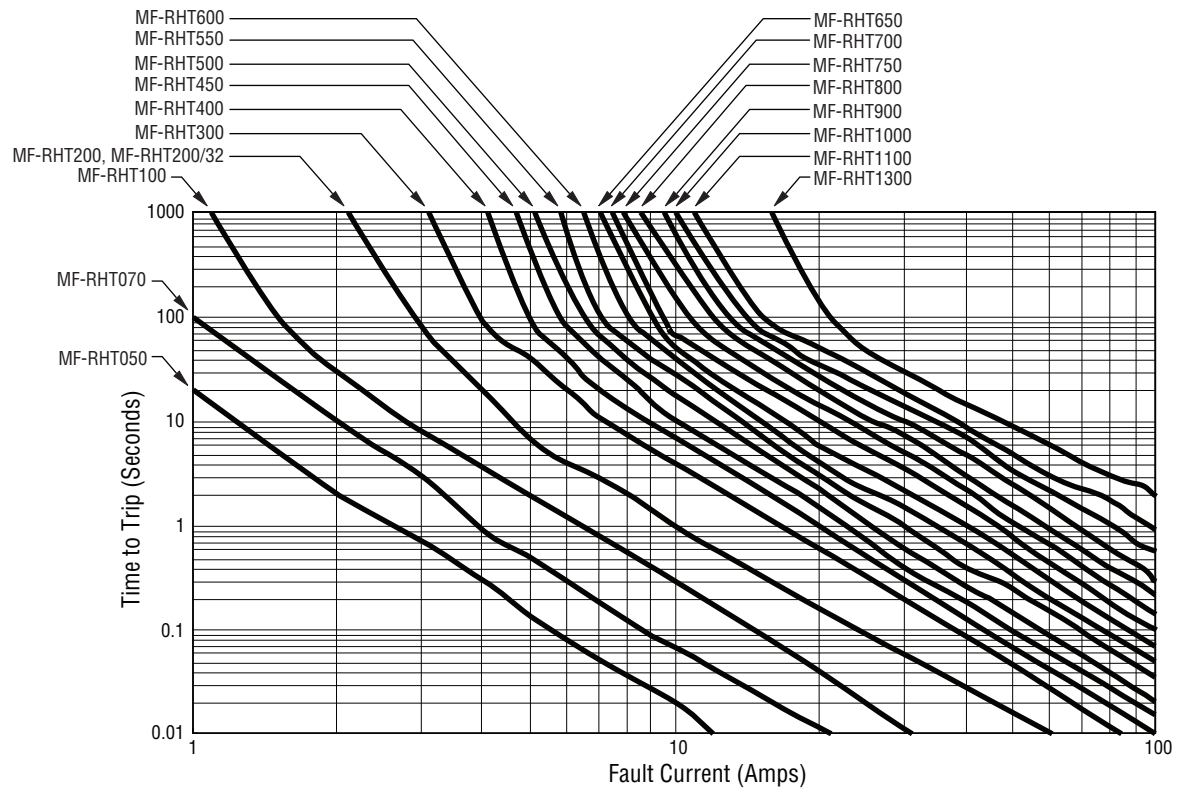
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## MF-RHT Series - High Temperature PTC Resettable Fuses

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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.

MF-RHT SERIES, REV. N, 05/18

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# MF-RHT Series Tape and Reel Specifications

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Devices taped using EIA468–B/IEC60286-2 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: MF-RHT050 ~ MF-RHT450	$H_1$	$H_1$	$\frac{32.2}{(1.268)}$	max.
Abscissa to top: MF-RHT500 ~ MF-RHT1300	$H_1$	$H_1$	$\frac{45.0}{(1.837)}$	max.
Overall width w/lead protrusion: MF-RHT050 ~ MF-RHT450		$C_1$	$\frac{42.5}{(1.673)}$	max.
Overall width w/lead protrusion: MF-RHT500 ~ MF-RHT1300		$C_1$	$\frac{55.0}{(2.165)}$	max.
Overall width w/o lead protrusion: MF-RHT050 ~ MF-RHT450		$C_2$	$\frac{42.5}{(1.673)}$	max.
Overall width w/o lead protrusion: MF-RHT500 ~ MF-RHT1300		$C_2$	$\frac{54.0}{(2.126)}$	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			$\frac{25.4}{(1.0)}$	$\frac{\pm 0.6}{(\pm .024)}$
Tape thickness	$t$	$t$	$\frac{0.9}{(.035)}$	max.
Tape thickness with splice: MF-RHT050 ~ MF-RHT200		$t_1$	$\frac{1.5}{(.059)}$	max.
Tape thickness with splice: MF-RHT300 ~ MF-RHT1300		$t_1$	$\frac{2.3}{(.091)}$	max.
Splice sprocket hole alignment			$\frac{4.0}{(.157)}$	$\frac{\pm 0.2}{(\pm .008)}$
Body lateral deviation	$\Delta_h$	$\Delta_h$	0	$\frac{\pm 1}{(\pm .039)}$
Body tape plane deviation	$\Delta_p$	$\Delta_p$	0	$\frac{\pm 0.3}{(\pm .012)}$
Ordinate to adjacent component lead	$P_1$	$P_1$	$\frac{3.81}{(.015)}$	$\frac{\pm 0.07}{(\pm .028)}$

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

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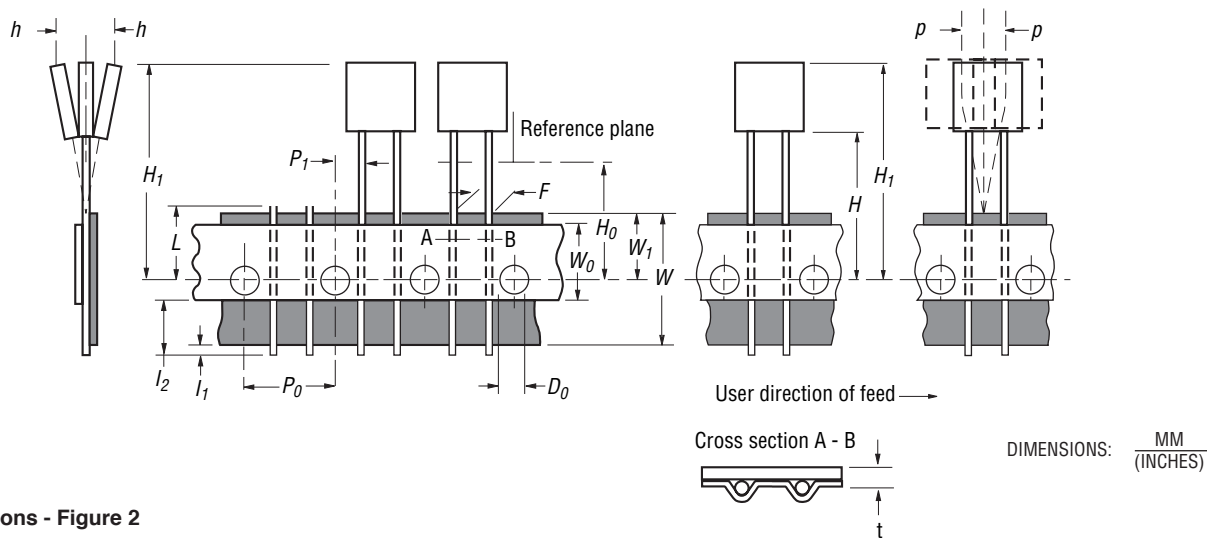
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# MF-RHT Series Tape and Reel Specifications

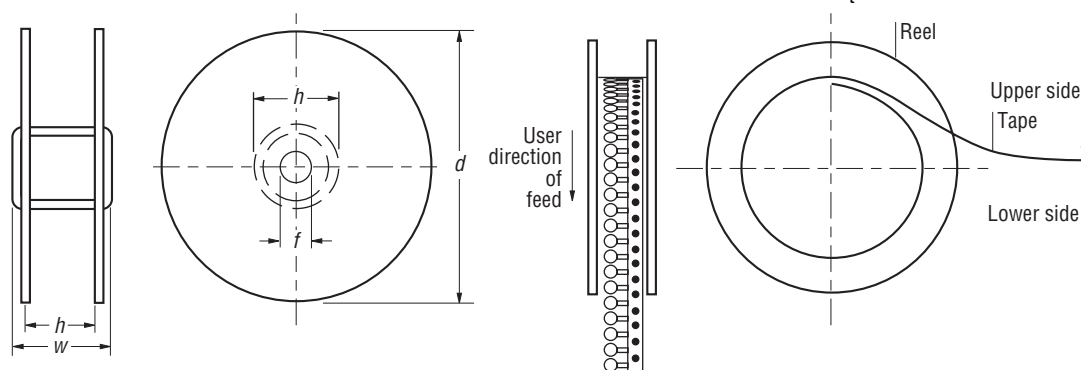
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Dimension Description	IEC Mark	EIA Mark	Dimensions	
			Dimensions	Tolerance
Lead spacing: MF-RHT050 ~ MF-RHT900	<i>F</i>	<i>F</i>	$\frac{5.08}{(0.2)}$	$\frac{-0.2/+0.8}{(-0.006/+0.031)}$
Lead spacing: MF-RHT1000 ~ MF-RHT1300	<i>F</i>	<i>F</i>	$\frac{10.2}{(0.402)}$	$\frac{-0.2/+0.8}{(-0.006/+0.031)}$
Reel width: MF-RHT050 ~ MF-RHT450	<i>w</i>	<i>W</i> <sub>2</sub>	$\frac{56}{(2.20)}$	max.
Reel width: MF-RHT500 ~ MF-RHT1300	<i>w</i>	<i>W</i> <sub>2</sub>	$\frac{63.5}{(2.50)}$	max.
Reel diameter	<i>d</i>	<i>a</i>	$\frac{370.0}{(14.57)}$	max.
Space between flanges less device	<i>W</i> <sub>1</sub>	<i>h</i>	$\frac{4.75}{(.187)}$	$\frac{\pm 3.25}{(\pm .128)}$
Arbor hole diameter	<i>f</i>	<i>c</i>	$\frac{26.0}{(1.02)}$	$\frac{\pm 12.0}{(\pm .472)}$
Core diameter	<i>h</i>	<i>n</i>	$\frac{80.0}{(3.15)}$	max.
Box			$\frac{62}{(2.44)}$ $\frac{355}{(14.0)}$ $\frac{345}{(13.6)}$	
Consecutive missing places			3	max.
Empty places per reel			Not specified	

**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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Users should verify actual device performance in their specific applications.

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