

#### **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**

	V max. Volts	l max. Amps	I <sub>hold</sub>	l <sub>trip</sub>	Resis	stance	Max. Time To Trip		Tripped Power Dissipation
Model			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.	Тур.
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	
FSD 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	Rmin $\leq$ R $\leq$ R1max
Time to Trip	At specified current, 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
Solderability	MIL-STD-202, Method 208	95 % min. coverage

Users should verify actual device performance in their specific applications.

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<sup>\*</sup> 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. Specifications are subject to change without notice.

### **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

## BOURNS

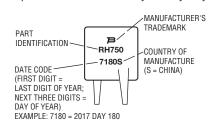
#### Thermal Derating Chart - Ihold (Amps)

	Ambient Operating Temperature											
Model	-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 -Multifuse® Product Designator Series RHT = High Temperature Radial Leaded Component Hold Current, Ihold 050 - 1300 (0.50 - 13.00 Amps) Higher Voltage Option Blank = Standard Voltage /32 = 32 Volts- 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

#### **Typical Part Marking**

Represents total content. Layout may vary.



\*Packaged per EIA 486-B

#### **Product Dimensions**

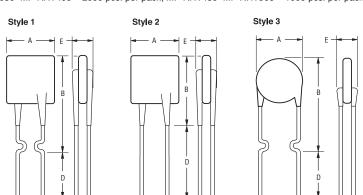
Model	A B		С		D	Е	F	Physical Characteristics	
wodei	Max.	Max.	Nom.	Tol. ±	Min.	Max.	Nom.	Style	Material
MF-RHT050	7.40	12.7	5.1	0.7	7.6	_3.0_	0.51	3	Sn/CuFe
WIF-NH 1030	(0.291)	(0.500)	(0.201)	(0.028)	(0.30)	(0.12)	(0.020)	3	SII/Cure
MF-RHT070	6.86	10.8	5.1	0.7	_7.6_	3.0	0.51	1	Sn/CuFe
11111070	(0.27)	(0.425)	(0.201)	(0.028)	(0.30)	(0.12)	(0.020)	'	Olivour o
MF-RHT100	9.70	_13.6_	5.1	0.7	7.6	3.0	0.51	3	Sn/CuFe
	(0.382)	(0.535)	(0.201)	(0.028)	(0.30)	(0.12)	(0.020)		0 0 0 0
MF-RHT200	9.4	14.0	5.1	0.7	7.6	3.0	0.51	3	Sn/CuFe
	(0.37)	(0.55)	(0.201)	(0.028)	(0.30)	(0.12)	(0.020)		
MF-RHT200/32	$\frac{9.4}{(0.37)}$	14.0 (0.55)	<u>5.1</u> (0.201)	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.30)}$	3.0 (0.12)	<u>0.51</u> (0.020)	3	Sn/CuFe
	8.80	13.8	5.1	0.028)		(- /	0.020)		
MF-RHT300	(0.35)	(0.55)	(0.201)	(0.028)	$\frac{7.6}{(0.30)}$	3.0 (0.12)	(0.032)	2	Sn/Cu
	10.0	15.0	5.1	0.7	7.6	3.0	0.81		
MF-RHT400	(0.394)	(0.591)	(0.201)	(0.028)	$\frac{7.0}{(0.30)}$	(0.12)	(0.032)	2	Sn/Cu
	10.4	15.6	5.1	0.7	7.6	3.0	0.81	2	
MF-RHT450	(0.41)	(0.61)	(0.201)	(0.028)	(0.30)	(0.12)	(0.032)		Sn/Cu
	11.2	18.9	5.1	0.7	7.6	3.0	0.81	2	Sn/Cu
MF-RHT500	(0.441)	(0.744)	(0.201)	(0.028)	(0.30)	(0.12)	(0.032)		
ME DUTEEO	11.2	18.9	5.1	0.7	7.6	3.0	0.81	2	Sn/Cu
MF-RHT550	(0.441)	(0.744)	(0.201)	(0.028)	(0.30)	(0.12)	(0.032)		
MF-RHT600	11.2	21.0	5.1	0.7	_7.6_	3.0	0.81	2	Sn/Cu
WII - HI I I 000	(0.441)	(0.827)	(0.201)	(0.028)	(0.30)	(0.12)	(0.032)		
MF-RHT650	12.7	_22.2_	5.1	0.7	7.6	3.0	_0.81_	2	Sn/Cu
11111000	(0.50)	(0.88)	(0.201)	(0.028)	(0.30)	(0.12)	(0.032)		01#00
MF-RHT700	_14.0_	21.9	5.1	0.7	7.6	3.0	0.81	2	Sn/Cu
	(0.55)	(0.862)	(0.201)	(0.028)	(0.30)	(0.12)	(0.032)	_	000
MF-RHT750	14.0	23.5	5.1	0.7	7.6	3.0	0.81	2	Sn/Cu
	(0.55)	(0.93)	(0.201)	(0.028)	(0.30)	(0.12)	(0.032)		
MF-RHT800	16.5	22.5	5.1	0.7	7.6	3.0	0.81	2	Sn/Cu
	(0.65)	(0.88)	(0.201)	(0.028)	(0.30)	(0.12)	(0.032)		
MF-RHT900	16.5 (0.65)	25.7 (1.012)	5.1 (0.201)	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.30)}$	3.0 (0.12)	$\frac{0.81}{(0.032)}$	2	Sn/Cu
MF-RHT1000	17.5	26.7	10.2	0.028)	7.6	3.0	0.81		
	(0.689)	(0.51)	$\frac{10.2}{(0.402)}$	$\frac{0.7}{(0.028)}$	$\frac{7.0}{(0.30)}$	(0.12)	(0.032)	2	Sn/Cu
MF-RHT1100	21.0	26.1	10.2	0.7	7.6	3.0	0.81	_	
	(0.65)	(0.88)	(0.402)	(0.028)	(0.30)	(0.12)	(0.032)	2	Sn/Cu
	23.5	28.7	10.2	0.7	7.6	3.6	1.0		0.10
MF-RHT1300	(0.925)	(1.17)	(0.402)	(0.028)	(0.30)	(0.14)	(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; 0.51 (24AWG) 0.81 (20AWG) 1.0 (18AWG)

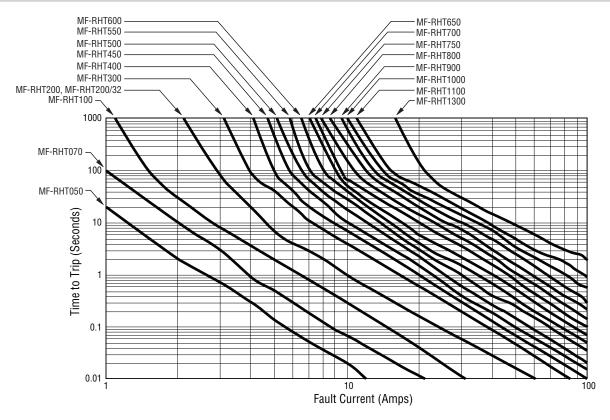
MM DIMENSIONS: (INCHES)

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



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

#### 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 Tape and Reel Specifications**

Devices taped using EIA468-B/IEC60286-2 standards. See table below and Figures 1 and 2 for details.

	IEC	EIA	Dimensions		
Dimension Description	Mark	Mark	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 <sub>2</sub>	W <sub>6</sub>	3 (.118)	max.	
Sprocket hole position	W <sub>1</sub>	W <sub>5</sub>	9 (.354)	-0.5/+0.75 (-0.02/+0.03)	
Sprocket hole diameter	D <sub>0</sub>	D <sub>0</sub>	<u>4</u> (.157)	±0.2 (±.0078)	
Abscissa to plane (straight lead)	Н	Н	18.5 (.728)	±3.0 (±.118)	
Abscissa to plane (kinked lead)	H <sub>0</sub>	H <sub>0</sub>	16 (.63)	±0.5 (±.02)	
Abscissa to top: MF-RHT050 ~ MF-RHT450	H <sub>1</sub>	H <sub>1</sub>	32.2 (1.268)	max.	
Abscissa to top: MF-RHT500 ~ MF-RHT1300	H <sub>1</sub>	H <sub>1</sub>	45.0 (1.837)	max.	
Overall width w/lead protrusion: MF-RHT050 ~ MF-RHT450		C <sub>1</sub>	42.5 (1.673)	max.	
Overall width w/lead protrusion: MF-RHT500 ~ MF-RHT1300		C <sub>1</sub>	<u>55.0</u> (2.165)	max.	
Overall width w/o lead protrusion: MF-RHT050 ~ MF-RHT450		C <sub>2</sub>	42.5 (1.673)	max.	
Overall width w/o lead protrusion: MF-RHT500 ~ MF-RHT1300		C <sub>2</sub>	54.0 (2.126)	max.	
Lead protrusion	11	L <sub>1</sub>	1.0 (.039)	max.	
Protrusion of cutout	L	L	11 (.433)	max.	
Protrusion beyond hold-down tape	12	12	Not specified		
Sprocket hole pitch	P <sub>0</sub>	P <sub>0</sub>	12.7 (0.5)	±0.3 (±.012)	
Pitch tolerance			20 consecutive	±1 (±.039)	
Device pitch			<u>25.4</u> (1.0)	±0.6 (±.024)	
Tape thickness	t	t	0.9 (.035)	max.	
Tape thickness with splice: MF-RHT050 ~ MF-RHT200		t <sub>1</sub>	1.5 (.059)	max.	
Tape thickness with splice: MF-RHT300 ~ MF-RHT1300		t <sub>1</sub>	2.3 (.091)	max.	
Splice sprocket hole alignment			4.0 (.157)	±0.2 (±.008)	
Body lateral deviation	$\Delta_h$	$\Delta_h$	0	±1 (±.039)	
Body tape plane deviation	$\Delta_{\mathcal{p}}$	$\Delta_{\mathcal{p}}$	0	±0.3 (±.012)	
Ordinate to adjacent component lead	P <sub>1</sub>	P <sub>1</sub>	3.81 (.015)	±0.07 (±.028)	

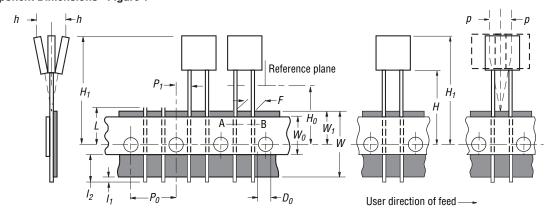
MM (INCHES) DIMENSIONS:

# **MF-RHT Series Tape and Reel Specifications**

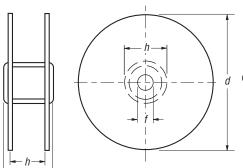
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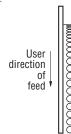
	IEC	EIA	Dimensions		
Dimension Description	Mark	Mark	Dimensions	Tolerance	
Lead spacing: MF-RHT050 ~ MF-RHT900	F	F	<u>5.08</u> (0.2)	-0.2/+0.8 (-0.006/+0.031)	
Lead spacing: MF-RHT1000 ~ MF-RHT1300	F	F	10.2 (0.402)	-0.2/+0.8 (-0.006/+0.031)	
Reel width: MF-RHT050 ~ MF-RHT450	w	W <sub>2</sub>	<u>56</u> (2.20)	max.	
Reel width: MF-RHT500 ~ MF-RHT1300	W	$W_2$	<u>63.5</u> (2.50)	max.	
Reel diameter	d	а	370.0 (14.57)	max.	
Space between flanges less device	W <sub>1</sub>	h	4.75 (.187)	±3.25 (±.128)	
Arbor hole diameter	f	С	<u>26.0</u> (1.02)	±12.0 (±.472)	
Core diameter	h	n	80.0 (3.15)	max.	
Вох			$\frac{62}{(2.44)} \frac{355}{(14.0)} \frac{345}{(13.6)}$		
Consecutive missing places			3	max.	
Empty places per reel			Not specified		

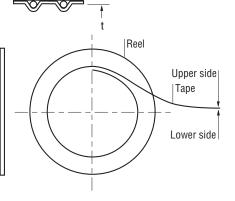
#### **Taped Component Dimensions - Figure 1**











MM (INCHES)

DIMENSIONS:

Specifications are subject to change without notice.

Users should verify actual device performance in their specific applications.

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