


Features

- Compliant with AEC-Q200 Rev-D 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 temperatures

- RoHS compliant* and halogen free**
- Agency recognition:  cULus

MF-RHS Series - High Temperature PTC Resettable Fuses

Electrical Characteristics

Model	V _{max}	I _{max}	I _{hold}	I _{trip}	Resistance		Max. Time to Trip		Tripped Power Dissipation	Agency Recognition	AEC-Q200 Compliant/ Automotive Grade
			at 23 °C		at 23 °C (Ohms)		at 23 °C		at 23 °C (Watts)	cUL	
	Volts	Amps	Amps	R _{min}	R _{1Max} ***	Amps	Seconds	Typ.	E174545		
MF-RHS350	16	100	3.5	7.0	0.018	0.050	17.5	4.5	3.0	✓	✓
MF-RHS400			4.0	8.0	0.016	0.044	20.0	5.0	3.0	✓	✓
MF-RHS450			4.5	9.0	0.0145	0.040	22.5	5.5	3.0	✓	✓
MF-RHS500			5.0	10.0	0.0135	0.038	25.0	5.8	3.0	✓	✓
MF-RHS550			5.5	11.0	0.0120	0.032	27.5	10.0	3.0	✓	✓
MF-RHS600			6.0	12.0	0.0090	0.0252	30.0	6.5	3.3	✓	✓
MF-RHS650			6.5	13.0	0.0095	0.0225	32.5	6.5	3.3	✓	✓
MF-RHS700			7.0	14.0	0.0085	0.0190	35.0	6.8	3.7	✓	✓
MF-RHS750			7.5	15.0	0.0073	0.0168	37.5	7.0	4.0	✓	✓
MF-RHS800			8.0	16.0	0.0060	0.0145	40.0	8.0	4.3	✓	✓
MF-RHS900			9.0	18.0	0.0046	0.0098	45.0	9.0	5.0	✓	✓
MF-RHS1000			10.0	20.0	0.0042	0.0090	50.0	10.0	5.4	✓	✓
MF-RHS1100			11.0	22.0	0.0038	0.0083	55.0	11.2	5.7	✓	✓
MF-RHS1200			12.0	24.0	0.0035	0.0077	60.0	12.5	6.0	✓	✓
MF-RHS1300			13.0	26.0	0.0033	0.0070	60.0	14.0	6.4	✓	✓

***R_{1max}: measured 1 hour post reflow.

Environmental Characteristics


Item	Condition	Criteria
Operating Temperature	-40 °C to +125 °C	
Recommended Storage	+40 °C max. / 70 % R.H. max.	
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 +125 °C, 10 times	±10 % typical resistance change
Solvent Resistance	MIL-STD-202, Method 215	No change (marking still legible)
Vibration	MIL-STD-883C, Method 2007.1 Condition A	No change (R _{min} < R < R _{1max})
Moisture Sensitivity Level (MSL)	See Note	
ESD Classification	Class 6 (per AEC-Q200-2, HBM)	

Additional Information

Click these links for more information:



[PRODUCT SELECTOR](#) [TECHNICAL LIBRARY](#) [INVENTORY](#) [SAMPLES](#) [CONTACT](#)

 **CALIFORNIA WARNING:** Can expose you to lead, a carcinogen and reproductive toxicant. See www.P65Warnings.ca.gov

* 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

- DC motors
- Servers and data centers
- HVAC (heating, ventilation and cooling) protection in motors, air-flow detection and I/O

MF-RHS Series - High Temperature PTC Resettable Fuses

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Test Procedures and Requirements

Item	Test Conditions	Accept/Reject Criteria
Visual/Mechanical	Verify dimensions and materials	Per MF physical description
Resistance	In still air @ 23 °C	$R_{min} \leq R \leq R_{max}$
Time to Trip	At specified current, V_{max} , 23 °C, still air	$T \leq \text{max. time to trip (seconds)}$
Hold Current	30 min. at I_{hold} , still air	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
Solderability	245 °C \pm 5 °C, 5 seconds	95 % min. coverage

Thermal Derating Table - 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-RHS350	4.8	4.5	4.1	3.5	3.2	3.0	2.8	2.5	2.1	1.0
MF-RHS400	5.2	4.9	4.5	4.0	3.5	3.3	3.0	2.6	2.2	1.0
MF-RHS450	5.4	5.2	5.0	4.5	3.8	3.5	3.2	2.9	2.4	1.1
MF-RHS500	6.3	6.0	5.7	5.0	4.7	4.4	4.0	3.8	3.3	1.5
MF-RHS550	8.1	7.2	6.2	5.5	5.1	4.8	4.3	4.0	3.5	1.7
MF-RHS600	8.6	7.7	6.6	6.0	5.5	5.2	4.8	4.4	3.8	1.8
MF-RHS650	9.0	8.1	7.2	6.5	6.0	5.5	5.1	4.7	4.1	1.9
MF-RHS700	9.4	8.6	7.9	7.0	6.4	5.8	5.4	4.9	4.4	2.0
MF-RHS750	9.9	9.1	8.4	7.5	6.7	6.1	5.8	5.2	4.6	2.2
MF-RHS800	11.2	9.7	8.9	8.0	7.1	6.5	6.3	5.8	4.8	2.6
MF-RHS900	13.1	11.4	10.3	9.0	8.4	7.8	7.4	6.6	5.9	3.1
MF-RHS1000	15.0	13.1	11.2	10.0	9.4	8.8	8.1	7.6	6.8	3.5
MF-RHS1100	15.7	13.8	12.2	11.0	10.0	9.2	8.4	7.9	7.1	3.6
MF-RHS1200	16.3	14.6	12.9	12.0	10.5	9.6	8.9	8.2	7.3	3.8
MF-RHS1300	16.8	15.4	14.0	13.0	11.5	10.3	9.4	8.5	7.5	3.9

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MF-RHS Series - High Temperature PTC Resettable Fuses



How to Order

MF - RHS 750 - 2 - 14

Multifuse® Product Designator _____

Series _____
 RHS = High Temperature Radial Leaded Component

Hold Current, I_{hold} _____
 350 - 1300 (3.50 - 13.0 Amps)

Packaging Options _____
 - 0 = Bulk Packaging
 - 2 = Tape & Reel*
 - AP = Ammo-Pak*

Part Number Suffix Option _____
 - 14 = Kinked leads where straight leads are standard

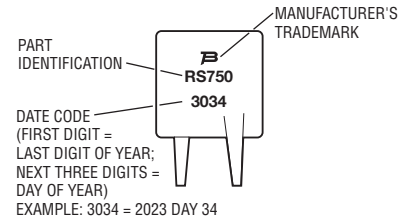
*Packaged per EIA-468

Packaging Quantity

Packaging options	Models	Unit Quantity (Pcs.)	Unit
Bulk	All models	500	Bag
Tape & Reel	MF-RHS350, MF-RHS400, MF-RHS450, MF-RHS500, MF-RHS550, MF-RHS600, MF-RHS650	3000	Reel
	MF-RHS700, MF-RHS750, MF-RHS800, MF-RHS900, MF-RHS1000	1500	
	MF-RHS1100, MF-RHS1200, MF-RHS1300	1000	
Ammo-Pack	MF-RHS350, MF-RHS400, MF-RHS450, MF-RHS500, MF-RHS550, MF-RHS600, MF-RHS650	2000	Box
	MF-RHS700, MF-RHS750, MF-RHS800, MF-RHS900, MF-RHS1000	1000	
	MF-RHS1100, MF-RHS1200, MF-RHS1300	500	

Typical Part Marking

Represents total content. Layout may vary.

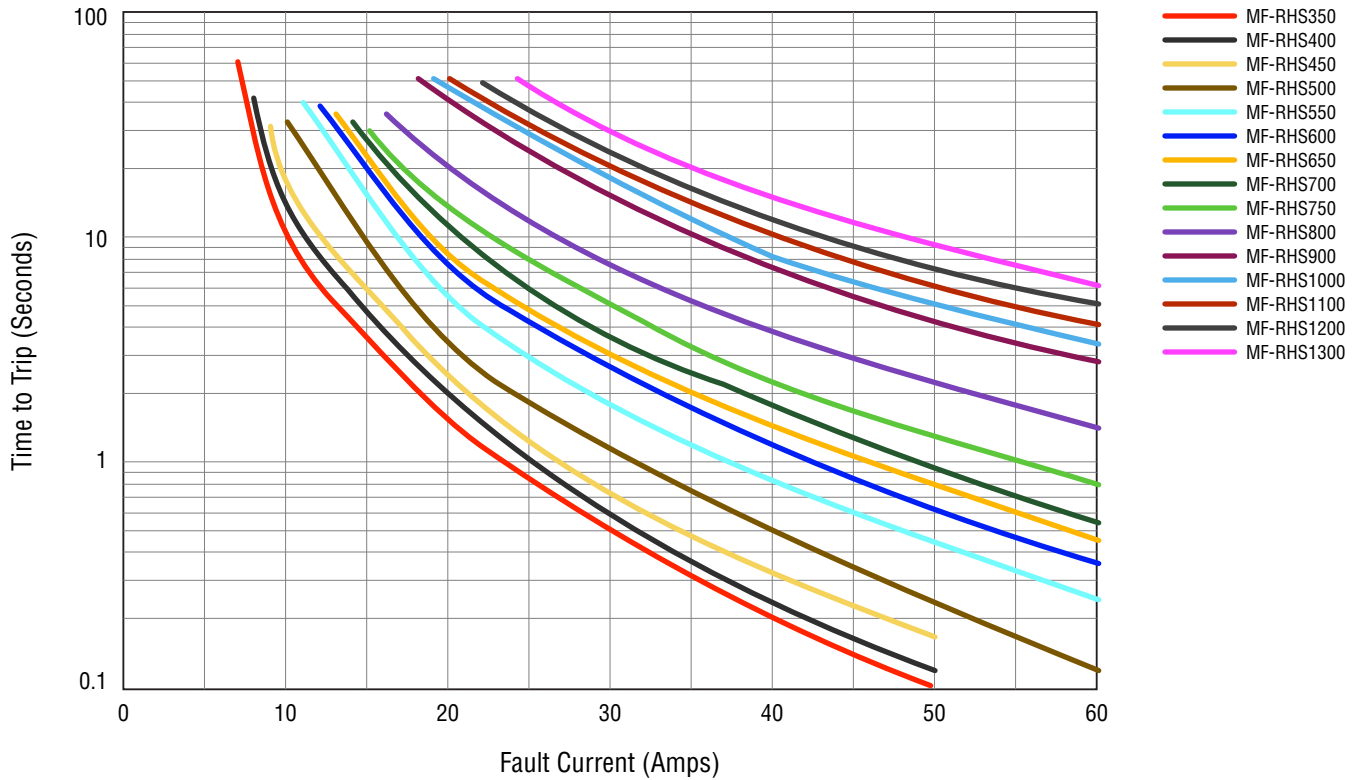


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Typical Time to Trip at 23 °C



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.

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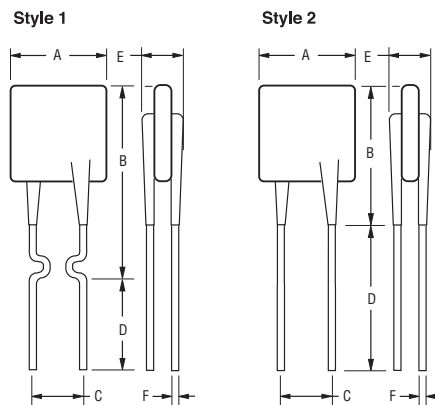
MF-RHS Series - High Temperature PTC Resettable Fuses

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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-RHS350	$\frac{8.40}{(0.331)}$	$\frac{16.9}{(0.665)}$	$\frac{5.1}{(0.201)}$	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.299)}$	$\frac{3.0}{(0.118)}$	$\frac{0.81}{(0.032)}$	2	Sn/Cu
MF-RHS400	$\frac{8.40}{(0.331)}$	$\frac{17.9}{(0.705)}$	$\frac{5.1}{(0.201)}$	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.299)}$	$\frac{3.0}{(0.118)}$	$\frac{0.81}{(0.032)}$	2	Sn/Cu
MF-RHS450	$\frac{8.40}{(0.331)}$	$\frac{18.9}{(0.744)}$	$\frac{5.1}{(0.201)}$	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.299)}$	$\frac{3.0}{(0.118)}$	$\frac{0.81}{(0.032)}$	2	Sn/Cu
MF-RHS500	$\frac{9.20}{(0.362)}$	$\frac{19.2}{(0.756)}$	$\frac{5.1}{(0.201)}$	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.299)}$	$\frac{3.0}{(0.118)}$	$\frac{0.81}{(0.032)}$	2	Sn/Cu
MF-RHS550	$\frac{9.30}{(0.366)}$	$\frac{19.5}{(0.768)}$	$\frac{5.1}{(0.201)}$	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.299)}$	$\frac{3.0}{(0.118)}$	$\frac{0.81}{(0.032)}$	2	Sn/Cu
MF-RHS600	$\frac{8.75}{(0.344)}$	$\frac{22.4}{(0.882)}$	$\frac{5.1}{(0.201)}$	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.299)}$	$\frac{3.0}{(0.118)}$	$\frac{0.81}{(0.032)}$	2	Sn/Cu
MF-RHS650	$\frac{10.70}{(0.421)}$	$\frac{23.2}{(0.913)}$	$\frac{5.1}{(0.201)}$	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.299)}$	$\frac{3.0}{(0.118)}$	$\frac{0.81}{(0.032)}$	2	Sn/Cu
MF-RHS700	$\frac{11.80}{(0.465)}$	$\frac{23.3}{(0.917)}$	$\frac{5.1}{(0.201)}$	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.299)}$	$\frac{3.0}{(0.118)}$	$\frac{0.81}{(0.032)}$	2	Sn/Cu
MF-RHS750	$\frac{11.80}{(0.465)}$	$\frac{24.3}{(0.957)}$	$\frac{5.1}{(0.201)}$	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.299)}$	$\frac{3.0}{(0.118)}$	$\frac{0.81}{(0.032)}$	2	Sn/Cu
MF-RHS800	$\frac{12.80}{(0.504)}$	$\frac{24.7}{(0.972)}$	$\frac{5.1}{(0.201)}$	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.299)}$	$\frac{3.6}{(0.142)}$	$\frac{1.00}{(0.039)}$	2	Sn/Cu
MF-RHS900	$\frac{14.40}{(0.567)}$	$\frac{24.9}{(0.980)}$	$\frac{10.2}{(0.402)}$	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.299)}$	$\frac{3.6}{(0.142)}$	$\frac{1.00}{(0.039)}$	2	Sn/Cu
MF-RHS1000	$\frac{14.40}{(0.567)}$	$\frac{27.9}{(1.098)}$	$\frac{10.2}{(0.402)}$	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.299)}$	$\frac{3.6}{(0.142)}$	$\frac{1.00}{(0.039)}$	2	Sn/Cu
MF-RHS1100	$\frac{17.40}{(0.685)}$	$\frac{27.9}{(1.098)}$	$\frac{10.2}{(0.402)}$	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.299)}$	$\frac{3.6}{(0.142)}$	$\frac{1.00}{(0.039)}$	2	Sn/Cu
MF-RHS1200	$\frac{17.40}{(0.685)}$	$\frac{27.9}{(1.098)}$	$\frac{10.2}{(0.402)}$	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.299)}$	$\frac{3.6}{(0.142)}$	$\frac{1.00}{(0.039)}$	2	Sn/Cu
MF-RHS1300	$\frac{17.40}{(0.685)}$	$\frac{28.9}{(1.138)}$	$\frac{10.2}{(0.402)}$	$\frac{0.7}{(0.028)}$	$\frac{7.6}{(0.299)}$	$\frac{3.6}{(0.142)}$	$\frac{1.00}{(0.039)}$	2	Sn/Cu

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



NOTE: Kinked lead option (-14) is also available, e.g. MF-RHS750-2-14. (refer to "How to Order" section.)

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MF-RHS Series Tape and Reel Specifications

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Devices taped using EIA-468/IEC 60286-2 standards. See table below and figures for details.

Dimension Description	IEC Mark	EIA Mark	Dimensions	Tolerance
Carrier tape width	W	W	$\frac{18}{(.709)}$	$\frac{+1.0/-0.5}{(+.039/- .020)}$
Hold down tape width	W_0	W_0	$\frac{5}{(.197)}$	min.
Hold down tape	No protrusion beyond the carrier tape			
Adhesive tape position	W_2	W_2	$\frac{3}{(.118)}$	max.
Sprocket hole position	W_1	W_1	$\frac{9}{(.354)}$	$\frac{+0.75-0.5}{(+.030/- .020)}$
Sprocket hole diameter	D_0	D_0	$\frac{4}{(.157)}$	$\frac{\pm 0.2}{(\pm .0078)}$
Height to seating plane (straight lead)	H	H	$\frac{18 \sim 20}{(.709 \sim .787)}$	
Height to seating plane (formed lead)	H_0	H_0	$\frac{16}{(.630)}$	$\frac{\pm 0.5}{(\pm .020)}$
Overall height above abscissa: MF-RHS350 ~ MF-RHS650	H_1	H_1	$\frac{38.5}{(1.516)}$	max.
Overall height above abscissa: MF-RHS700 ~ MF-RHS1300	H_1	H_1	$\frac{45.0}{(1.772)}$	max.
Cutout length		L	$\frac{11}{(.433)}$	max.
Sprocket hole pitch	P_0	P_0	$\frac{12.7}{(.500)}$	$\frac{\pm 0.3}{(\pm .012)}$
Device pitch: MF-RHS350 ~ MF-RHS650	P	P	$\frac{12.7}{(0.50)}$	$\frac{\pm 0.3}{(\pm .012)}$
Device pitch: MF-RHS700 ~ MF-RHS1300	P	P	$\frac{25.4}{(1.00)}$	$\frac{\pm 0.6}{(\pm .024)}$
Pitch tolerance			20 consecutive	$\frac{\pm 1}{(\pm .039)}$
Composite tape thickness	t	t	$\frac{0.9}{(.035)}$	max.
Overall tape and lead thickness	t_1	t_1	$\frac{2.3}{(.091)}$	max.
Splice sprocket hole alignment			0	$\frac{\pm 0.3}{(\pm .012)}$
Front-to-back deviation	Δ_h	Δ_h	0	$\frac{\pm 1.0}{(\pm .039)}$
Side-to-side deviation	Δ_p	Δ_p	0	$\frac{\pm 1.3}{(\pm .051)}$
Ordinate to adjacent component lead: MF-RHS350 ~ MF-RHS800	P_1	P_1	$\frac{3.81}{(.150)}$	$\frac{\pm 0.7}{(\pm .028)}$
Ordinate to adjacent component lead: MF-RHS900 ~ MF-RHS1300	P_1	P_1	$\frac{7.62}{(.300)}$	$\frac{\pm 0.7}{(\pm .028)}$
Lead spacing: MF-RHS350 ~ MF-RHS800	F	F	$\frac{5.08}{(.200)}$	$\frac{+0.6/-0.2}{(+.024/- .008)}$
Lead spacing: MF-RHS900 ~ MF-RHS1300	F	F	$\frac{10.2}{(.400)}$	$\frac{+0.6/-0.2}{(+.024/- .008)}$

— Continued on next page —

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

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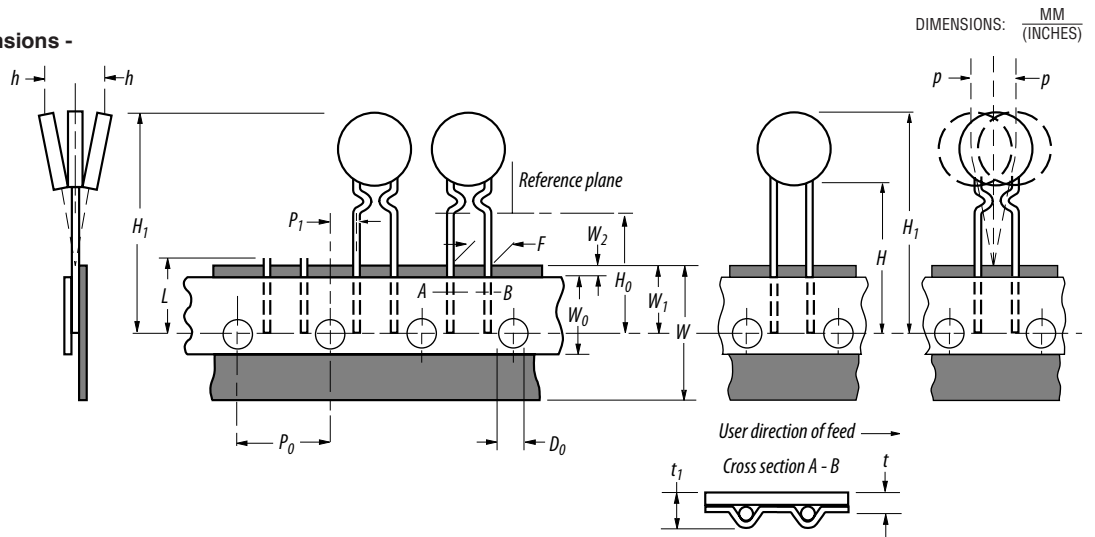
MF-RHS Series Tape and Reel Specifications

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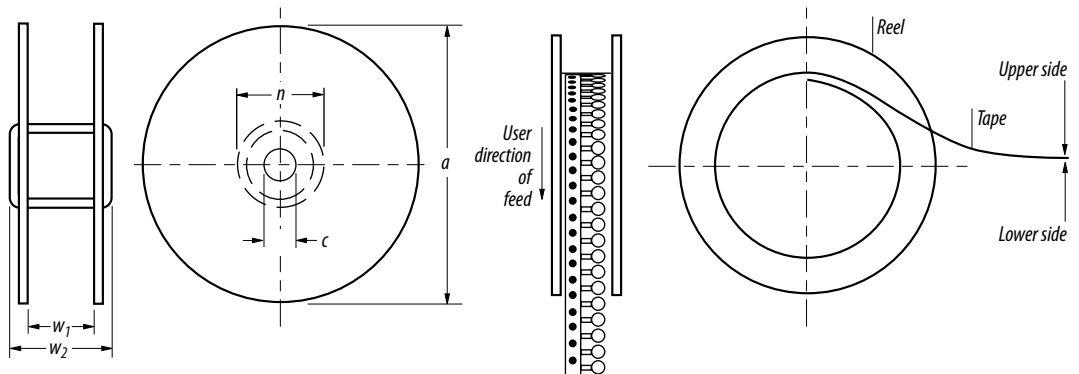
Devices taped using EIA-468/IEC 60286-2 standards. See table below and figures for details.

Dimension Description	IEC Mark	EIA Mark	Dimensions	Tolerance
Reel width including flanges and hub	W_4	w_2	$\frac{62.0}{(2.44)}$	max
Dimension between flanges (measured at hub)	W_3	w_1	allow proper reeling and unreeling	
Reel diameter	A	a	$\frac{370.0}{(14.57)}$	max.
Space between flanges (at hub, excluding device)			$\frac{4.75}{(.187)}$	± 3.25 ($\pm .128$)
Arbor hole diameter	C	c	$\frac{26.0}{(1.024)}$	± 12.0 ($\pm .472$)
Core diameter	N	n	$\frac{80}{(3.15)}$	min.
Box dimensions			$\frac{62 \times 372 \times 372}{(2.44 \times 14.6 \times 14.6)}$	max.
Consecutive missing places			3	max.
Empty places per reel			Less than 0.1 %	

Taped Component Dimensions - per EIA Mark - Figure 1



Reel Dimensions - per EIA Mark - Figure 2



MF-RHS SERIES, REV. D, 05/26

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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

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The characteristics and parameters of a Bourns® product set forth in its data sheet are based on laboratory conditions, and statements regarding the suitability of products for certain types of applications are based on Bourns' knowledge of typical requirements in generic applications. The characteristics and parameters of a Bourns® product in a user application may vary from the data sheet characteristics and parameters due to (i) the combination of the Bourns® product with other components in the user's application, or (ii) the environment of the user application itself. The characteristics and parameters of a Bourns® product also can and do vary in different applications and actual performance may vary over time. Users should always verify the actual performance of the Bourns® product in their specific devices and applications, and make their own independent judgments regarding the amount of additional test margin to design into their device or application to compensate for differences between laboratory and real world conditions.

Unless Bourns has explicitly designated an individual Bourns® product as meeting the requirements of a particular industry standard (e.g., IATF 16949) or a particular qualification (e.g., UL listed or recognized), Bourns is not responsible for any failure of an individual Bourns® product to meet the requirements of such industry standard or particular qualification. Users of Bourns® products are responsible for ensuring compliance with safety-related requirements and standards applicable to their devices or applications.

Bourns® products are not recommended, authorized or intended for use in nuclear, lifesaving, life-critical or life-sustaining applications, nor in any other applications where failure or malfunction may result in personal injury, death, or severe property or environmental damage. Unless expressly and specifically approved in writing by two authorized Bourns representatives on a case-by-case basis, use of any Bourns® products in such unauthorized applications might not be safe and thus is at the user's sole risk. Life-critical applications include devices identified by the U.S. Food and Drug Administration as Class III devices and generally equivalent classifications outside of the United States.

Bourns expressly identifies those Bourns® standard products that are suitable for use in automotive applications on such products' data sheets in the section entitled "Applications." Unless expressly and specifically approved in writing by two authorized Bourns representatives on a case-by-case basis, use of any other Bourns® standard products in an automotive application might not be safe and thus is not recommended, authorized or intended and is at the user's sole risk. If Bourns expressly identifies a sub-category of automotive application in the data sheet for its standard products (such as infotainment or lighting), such identification means that Bourns has reviewed its standard product and has determined that if such Bourns® standard product is considered for potential use in automotive applications, it should only be used in such sub-category of automotive applications. Any reference to Bourns® standard product in the data sheet as compliant with the AEC-Q standard or "automotive grade" does not by itself mean that Bourns has approved such product for use in an automotive application.

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