BOURNS®

Features

- Operating temperature range up to 125 °C
- Low thermal derating factor
- Higher hold currents at elevated temperatures
- RoHS compliant* and halogen free**
- Agency recognition: c UL us

MF-RHS Series - High Temperature PPTC Resettable Fuses

Electrical Characteristics

Model	V_{max}	I_{max}	I_{hold}	I_{trip}	Resistance		Max. Time to Trip		Tripped Power Dissipation	Agency Recognition
			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

WARNING
Cancer and Reproductive Harm
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.

Applications

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

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 ≤ 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 ± 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

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

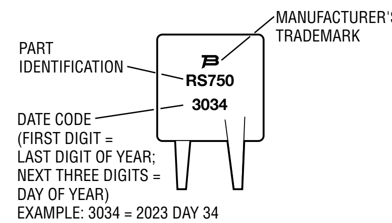
*Packaged per EIA-468

Packaging Quantity

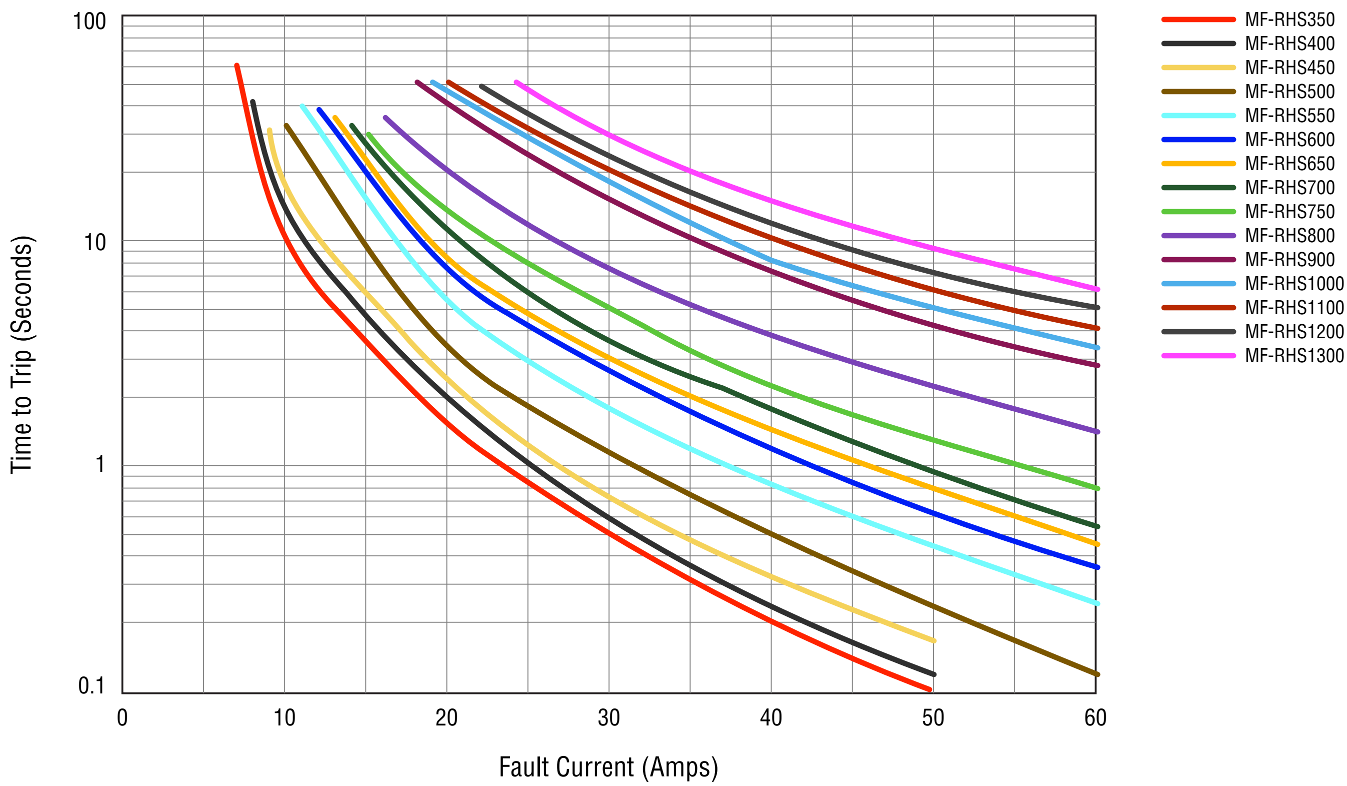
Packaging options	Models	Unit Quantity (Pcs.)	Unit
Bulk	All models	500	Bag
Tape & Reel	MF-RHS350, MF-RHS400, MF-RHS450, MF-RHS500, MF-RHS550, MF-RHS600, MF-RHS650	3000	Reel
	MF-RHS700, MF-RHS750, MF-RHS800, MF-RHS900, MF-RHS1000	1500	
	MF-RHS1100, MF-RHS1200, MF-RHS1300	1000	
Ammo-Pack	MF-RHS350, MF-RHS400,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



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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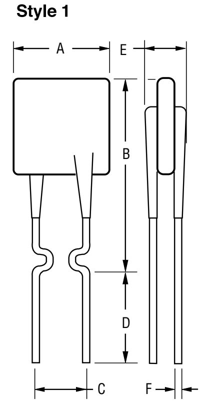
EMEA: Tel: +36 88 885 877 • Email: eurocus@bourns.com
The Americas: Tel: +1-951 781-5500 • Email: americus@bourns.com
www.bourns.com

Product Dimensions

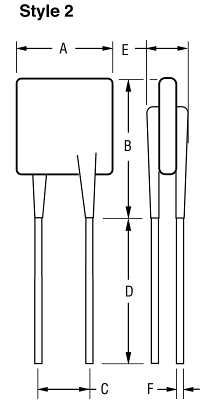
Model	A	B	C		D	E	F	Physical Characteristics	
	Max.	Max.	Nom.	Tol. ±	Min.	Max.	Nom.	Style	Material
MF-RHS350	8.40 (0.331)	16.9 (0.665)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.0 (0.118)	0.81 (0.032)	2	Sn/Cu
MF-RHS400	8.40 (0.331)	17.9 (0.705)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.0 (0.118)	0.81 (0.032)	2	Sn/Cu
MF-RHS450	8.40 (0.331)	18.9 (0.744)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.0 (0.118)	0.81 (0.032)	2	Sn/Cu
MF-RHS500	9.20 (0.362)	19.2 (0.756)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.0 (0.118)	0.81 (0.032)	2	Sn/Cu
MF-RHS550	9.30 (0.366)	19.5 (0.768)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.0 (0.118)	0.81 (0.032)	2	Sn/Cu
MF-RHS600	8.75 (0.344)	22.4 (0.882)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.0 (0.118)	0.81 (0.032)	2	Sn/Cu
MF-RHS650	10.70 (0.421)	23.2 (0.913)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.0 (0.118)	0.81 (0.032)	2	Sn/Cu
MF-RHS700	11.80 (0.465)	23.3 (0.917)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.0 (0.118)	0.81 (0.032)	2	Sn/Cu
MF-RHS750	11.80 (0.465)	24.3 (0.957)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.0 (0.118)	0.81 (0.032)	2	Sn/Cu
MF-RHS800	12.80 (0.504)	24.7 (0.972)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.6 (0.142)	1.00 (0.039)	2	Sn/Cu
MF-RHS900	14.40 (0.567)	24.9 (0.980)	10.2 (0.402)	0.7 (0.028)	7.6 (0.299)	3.6 (0.142)	1.00 (0.039)	2	Sn/Cu
MF-RHS1000	14.40 (0.567)	27.9 (1.098)	10.2 (0.402)	0.7 (0.028)	7.6 (0.299)	3.6 (0.142)	1.00 (0.039)	2	Sn/Cu
MF-RHS1100	17.40 (0.685)	27.9 (1.098)	10.2 (0.402)	0.7 (0.028)	7.6 (0.299)	3.6 (0.142)	1.00 (0.039)	2	Sn/Cu
MF-RHS1200	17.40 (0.685)	27.9 (1.098)	10.2 (0.402)	0.7 (0.028)	7.6 (0.299)	3.6 (0.142)	1.00 (0.039)	2	Sn/Cu
MF-RHS1300	17.40 (0.685)	28.9 (1.138)	10.2 (0.402)	0.7 (0.028)	7.6 (0.299)	3.6 (0.142)	1.00 (0.039)	2	Sn/Cu

DIMENSIONS: MM / (INCHES)

Style 1



Style 2



Also available with kinked leads in place of standard leads (Style 1).
(see How to Order).

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

— Continued on next page —

DIMENSIONS: MM / (INCHES)

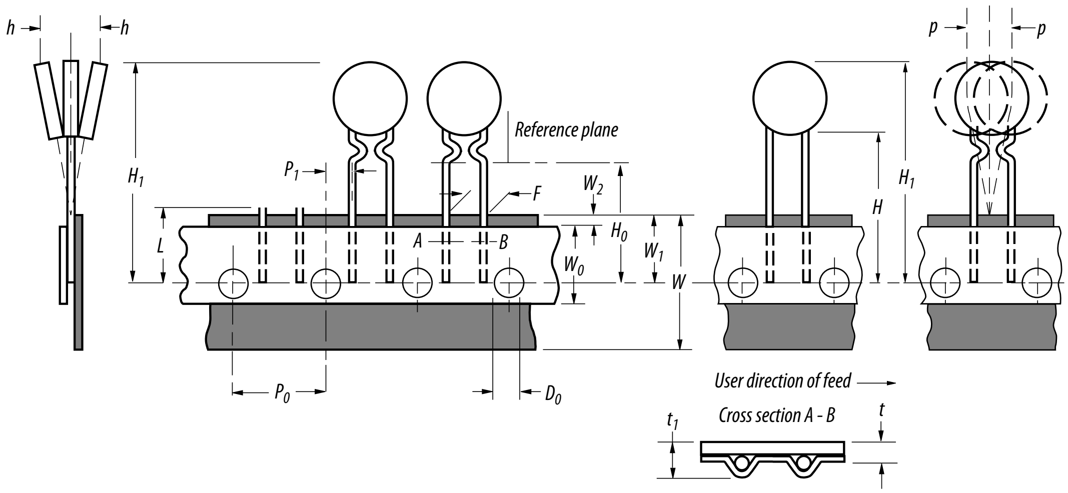
MF-RHS Series Tape and Reel Specifications

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

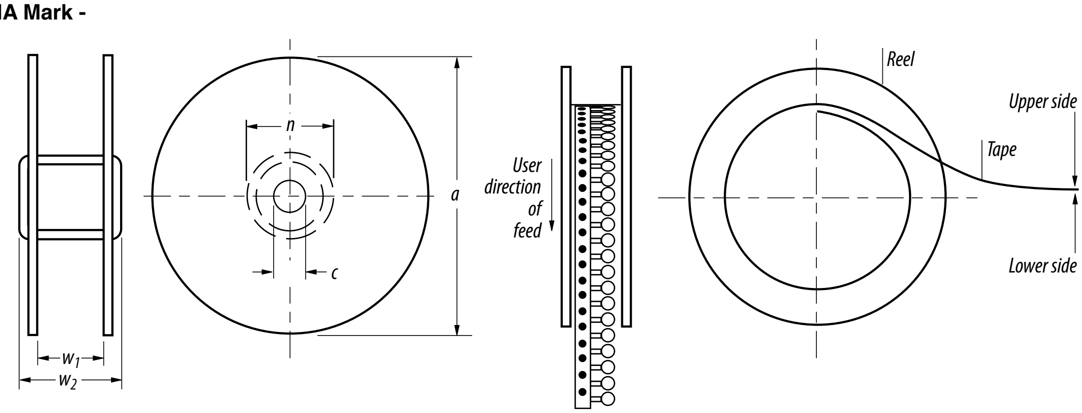
Dimension Description	IEC Mark	EIA Mark	Dimensions	Tolerance
Reel width including flanges and hub	W_4	w_2	62.0 (2.44)	max
Dimension between flanges (measured at hub)	W_3	w_1	allow proper reeling and unreeling	
Reel diameter	A	a	370.0 (14.57)	max.
Space between flanges (at hub, excluding device)			4.75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

DIMENSIONS: MM (INCHES)

Taped Component Dimensions - per EIA Mark - Figure 1



Reel Dimensions - per EIA Mark - Figure 2



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 use and level of testing applicable to Bourns® custom products shall be negotiated on a case-by-case basis by Bourns and the user for which such Bourns® custom products are specially designed. Absent a written agreement between Bourns and the user regarding the use and level of such testing, the above provisions applicable to Bourns® standard products shall also apply to such Bourns® custom products.

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MF-RHS450-0 MF-RHS550-0 MF-RHS750-0 MF-RHS400-0 MF-RHS350-0 MF-RHS1100-0 MF-RHS800-0 MF-RHS900-0 MF-RHS500-0 MF-RHS1300-0 MF-RHS650-0 MF-RHS1000-0 MF-RHS1200-0 MF-RHS600-0 MF-RHS700-0