BOURNS®

Features

- Compliant with AEC-Q200 Rev-D- Stress Test Qualification for Passive Components in Automotive Applications
- Radial leaded devices
- Smaller size vs. comparable I_{hold} ratings
- Faster tripping
- RoHS compliant* and halogen free**
- Agency recognition: cULus

Applications

- Automotive applications
- Where space is limited and fast tripping is required

MF-RG Series - PTC Resettable Fuses

Environmental Characteristics

Item	Condition	Criteria
Operating Temperature	-40 °C to +85 °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 +85 °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

Electrical Characteristics

Model	V_{max}	I_{max}	I_{hold}	I_{trip}	Initial Resistance		1 Hour (R_1) Post-Trip Resistance	Max. Time to Trip		Tripped Power Dissipation	Agency Recognition	AEC-Q200 Compliant
			at 23 °C		at 23 °C Ohms		at 23 °C Ohms	at 23 °C		at 23 °C Watts	cUL	
	Volts	Amps	Amps		Min.	Max.	Max.	Amps	Seconds	Typ.	E174545	
MF-RG300	16	100	3.0	5.1	0.0380	0.0650	0.0975	15	1.0	2.3	✓	✓
MF-RG400	16	100	4.0	6.8	0.0210	0.0385	0.0600	20	1.7	2.4	✓	✓
MF-RG500	16	100	5.0	8.5	0.0150	0.0230	0.0340	25	2.0	2.6	✓	✓
MF-RG600	16	100	6.0	10.2	0.0100	0.0185	0.0280	30	3.3	2.8	✓	✓
MF-RG650	16	100	6.5	11.1	0.0088	0.0158	0.0240	33	3.5	3.0	✓	✓
MF-RG700	16	100	7.0	11.9	0.0077	0.0130	0.0200	35	3.5	3.0	✓	✓
MF-RG800	16	100	8.0	13.6	0.0056	0.0110	0.0175	40	5.0	3.0	✓	✓
MF-RG900	16	100	9.0	15.3	0.0047	0.0092	0.0135	45	5.5	3.3	✓	✓
MF-RG1000	16	100	10.0	17.0	0.0040	0.0071	0.0102	50	6.0	3.6	✓	✓
MF-RG1100	16	100	11.0	18.7	0.0037	0.0062	0.0089	55	7.0	3.7	✓	✓

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.

Test Procedures and Requirements

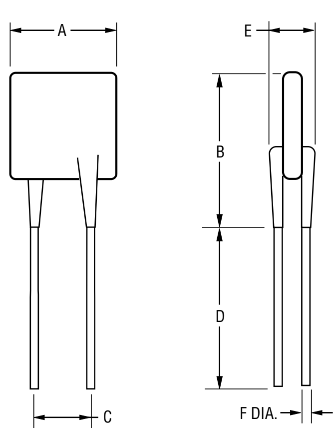
Item	Test Condition	Accept/Reject Criteria
Visual/Mechanical	Verify dimensions and materials	Per MF physical description
Resistance	In still air @ 23 °C	$R_{min} \leq R \leq R_{max}$
Time to Trip	5 times I_{hold}, V_{max}, 23 °C	T ≤ max. time to trip (seconds)
Hold Current	30 min. at I_{hold}	No trip
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

Product Dimensions

Model	A Max.	B Max.	C		D Min.	E Max.	F Nom.	Physical Characteristics	
			Nom.	Tol. ±				Style	Wire Material
MF-RG300	7.1 (0.280)	11.0 (0.433)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.0 (0.118)	0.81 (0.032)	1	Sn/Cu
MF-RG400	9.9 (0.390)	12.8 (0.504)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.0 (0.118)	0.81 (0.032)	1	Sn/Cu
MF-RG500	10.4 (0.409)	14.3 (0.563)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.0 (0.118)	0.81 (0.032)	1	Sn/Cu
MF-RG600	10.7 (0.421)	17.1 (0.673)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.0 (0.118)	0.81 (0.032)	1	Sn/Cu
MF-RG650	11.2 (0.441)	19.7 (0.776)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.0 (0.118)	0.81 (0.032)	1	Sn/Cu
MF-RG700	11.2 (0.441)	19.7 (0.776)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.0 (0.118)	0.81 (0.032)	1	Sn/Cu
MF-RG800	12.7 (0.500)	20.9 (0.823)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.0 (0.118)	0.81 (0.032)	1	Sn/Cu
MF-RG900	14.0 (0.551)	21.7 (0.854)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.0 (0.118)	0.81 (0.032)	1	Sn/Cu
MF-RG1000	16.5 (0.650)	25.2 (0.992)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.0 (0.118)	0.81 (0.032)	1	Sn/Cu
MF-RG1100	17.5 (0.689)	26.0 (1.024)	5.1 (0.201)	0.7 (0.028)	7.6 (0.299)	3.0 (0.118)	0.81 (0.032)	1	Sn/Cu

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

Style 1



Also available with kinked leads (see How to Order).

How to Order

MF - RG 300 - 0 - 14

Multifuse® Product Designator

Series
- RG = Smaller Radial Leaded Component

Hold Current, I_{hold}
- 300-1100 (3.0 Amps - 11.0 Amps)

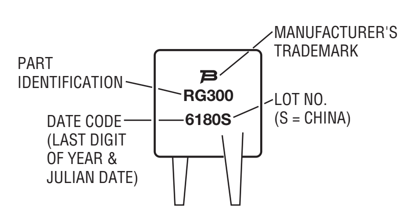
Packaging Options
- 0 = Bulk Packaging
- 2 = Tape and Reel*
- AP = Ammo-Pak*

Part Number Suffix Option
- __ = Standard Straight Leads without part number suffix option
- 14 = Kinked Leads where straight leads are standard

*Packaged per EIA-468

Typical Part Marking

Represents total content. Layout may vary.

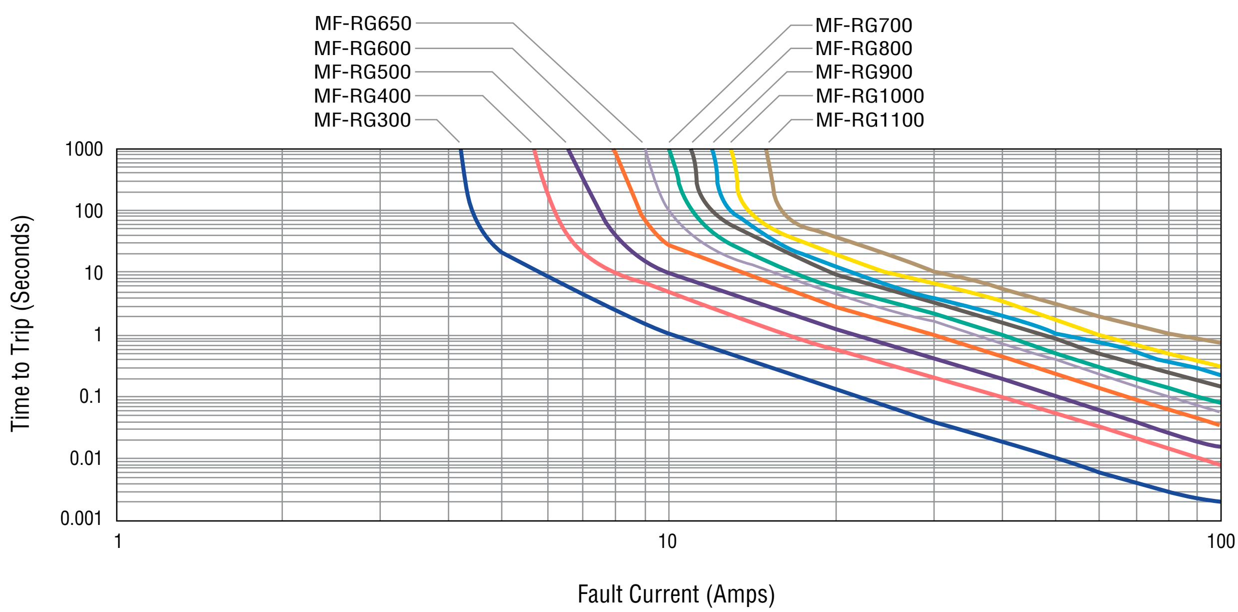


Thermal Derating Table - I_{hold} (Amps)

Model	Ambient Operating Temperature								
	-40 °C	-20 °C	0 °C	23 °C	40 °C	50 °C	60 °C	70 °C	85 °C
MF-RG300	4.4	4.0	3.6	3.0	2.6	2.4	2.1	1.9	1.4
MF-RG400	5.9	5.3	4.8	4.0	3.5	3.2	2.8	2.5	1.9
MF-RG500	7.3	6.6	6.0	5.0	4.4	4.0	3.6	3.1	2.4
MF-RG600	8.8	8.0	7.2	6.0	5.2	4.8	4.2	3.8	2.8
MF-RG650	9.5	8.6	7.8	6.5	5.7	5.2	4.6	4.1	3.0
MF-RG700	10.3	9.3	8.4	7.0	6.2	5.6	5.0	4.4	3.3
MF-RG800	11.7	10.7	9.6	8.0	6.9	6.4	5.6	5.1	3.7
MF-RG900	13.2	11.9	10.7	9.0	7.9	7.2	6.4	5.6	4.2
MF-RG1000	14.7	13.3	12.0	10.0	8.7	8.0	7.0	6.3	4.7
MF-RG1100	16.1	14.6	13.1	11.0	9.7	8.8	7.8	6.9	5.2

I_{trip} is approximately two times I_{hold}.

Typical Time to Trip at 23 °C



Packaging Quantity

Packaging options	Models	Unit Quantity (Pcs.)	Unit
Bulk	All models	500	Bag
Tape & Reel	MF-RG300 ~ MF-RG500	3000	Reel
	MF-RG600 ~ MF-RG1100	1000	
Ammo-Pack	MF-RG300 ~ MF-RG500	2000	Pack
	MF-RG600 ~ MF-RG1100	1000	

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	5 (.197)	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-RG300 ~ MF-RG800	H_1	H_1	38.5 (1.516)	max.
Overall height above abscissa: MF-RG900 ~ MF-RG1100	H_1	H_1	43.5 (1.713)	max.
Cutout length		L	11 (.433)	max.
Sprocket hole pitch	P_0	P_0	12.7 (.500)	±0.3 (±.012)
Device pitch: MF-RG300 ~ MF-RG500	P	P	12.7 (.500)	±0.3 (±.012)
Device pitch: MF-RG600 ~ MF-RG1100	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	Δh	Δh	0	±1.0 (±.039)
Side-to-side deviation	Δp	Δp	0	±1.3 (±.051)
Ordinate to adjacent component lead	P_1	P_1	3.81 (.150)	±0.7 (±.028)
Lead spacing	F	F	5.08 (.200)	+0.6/-0.2 (+.024/-.008)

— Continued on next page —

DIMENSIONS: MM (INCHES)

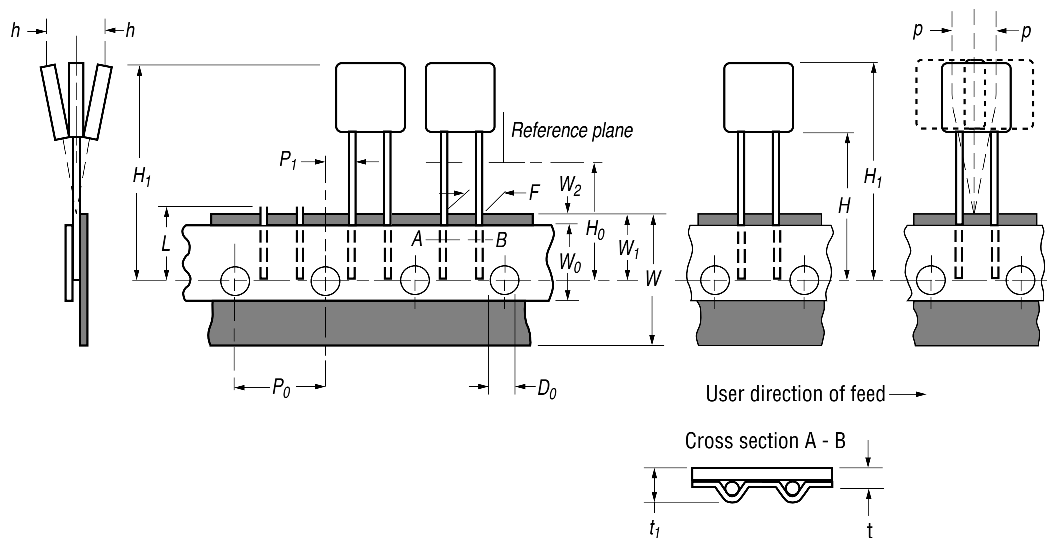
Dimension Description	IEC Mark	EIA Mark	Dimensions	Tolerance
Reel width including flanges and hub	W_4	w_2	62.0 / (2.44)	max
Dimension between flanges (measured at hub)	W_3	w_1	allow proper reeling and unreeling	
Reel diameter	A	a	370.0 / (14.57)	max.
Space between flanges (at hub, excluding device)			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

Applies to Models:

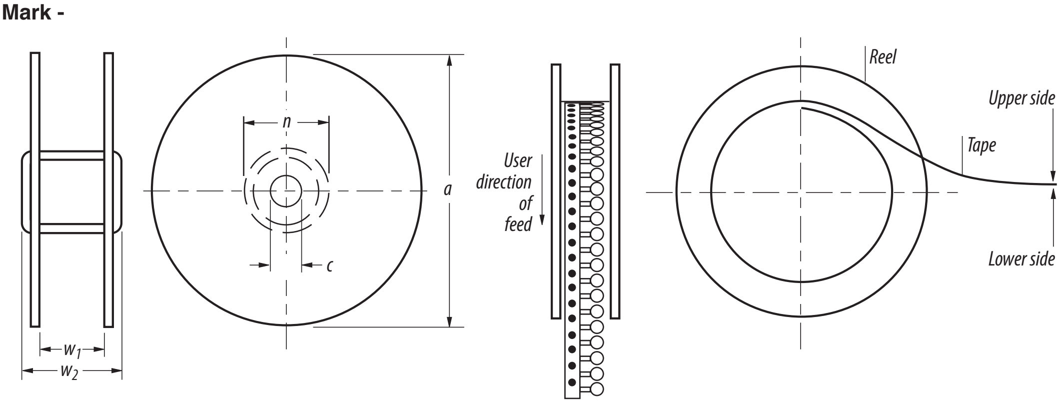
MF-RG300 ~ MF-RG1100



Reel Dimensions - per EIA Mark - Figure 2

Applies to Models:

MF-RG300 ~ MF-RG1100



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