



## Features

- Radial leaded devices
- Cured, flame retardant epoxy polymer insulating material meets UL 94V-0 requirements
- Bulk packaging, tape and reel available
- Resettable circuit protection
- Agency recognition:  
- RoHS compliant\* and halogen free\*\*

## Applications

- Food blenders, coffee machines
- HVAC
- Electric fans, blowers
- AC adaptors

## MF-RM Series - PTC Resettable Fuses

### Electrical Characteristics

| Model        | Typical Current Trip Limit |                            | V <sub>max</sub>  |                   | I <sub>max</sub>  | Initial Resistance         | One Hour Post-Trip Resistance | Max. Time to Trip |        | Tripped Power Dissipation |
|--------------|----------------------------|----------------------------|-------------------|-------------------|-------------------|----------------------------|-------------------------------|-------------------|--------|---------------------------|
|              | I <sub>hold</sub> at 23 °C | I <sub>trip</sub> at 23 °C | Operating Voltage | Interrupt Voltage | Interrupt Current | R <sub>Min.</sub> at 23 °C | R <sub>1</sub> Max. at 23 °C  | at 23 °C          |        | PD Typ. at 23 °C          |
|              | (A)                        | (A)                        | (Vac)             | (Vac)             | (A)               | (Ohms)                     | (Ohms)                        | (A)               | (Sec.) | (W)                       |
| MF-RM005/240 | 0.05                       | 0.12                       | 240               | 265               | 1.0               | 18.50                      | 65.00                         | 0.25              | 10.0   | 0.9                       |
| MF-RM008/240 | 0.08                       | 0.19                       | 240               | 265               | 1.2               | 7.40                       | 26.00                         | 0.40              | 10.0   | 0.9                       |
| MF-RM012/240 | 0.12                       | 0.30                       | 240               | 265               | 1.2               | 3.00                       | 12.00                         | 0.60              | 15.0   | 1.0                       |
| MF-RM016/240 | 0.16                       | 0.37                       | 240               | 265               | 2.0               | 2.50                       | 7.80                          | 0.80              | 15.0   | 1.4                       |
| MF-RM025/240 | 0.25                       | 0.56                       | 240               | 265               | 3.5               | 1.30                       | 3.80                          | 1.25              | 18.5   | 1.5                       |
| MF-RM033/240 | 0.33                       | 0.74                       | 240               | 265               | 4.5               | 0.77                       | 2.60                          | 1.65              | 21.0   | 1.7                       |
| MF-RM040/240 | 0.40                       | 0.90                       | 240               | 265               | 5.5               | 0.60                       | 1.90                          | 2.00              | 24.0   | 2.0                       |
| MF-RM055/240 | 0.55                       | 1.25                       | 240               | 265               | 7.0               | 0.45                       | 1.45                          | 2.75              | 26.0   | 3.4                       |

### Environmental Characteristics

|                            |                                                                   |
|----------------------------|-------------------------------------------------------------------|
| Operating Temperature..... | -20 °C to +85 °C                                                  |
| Humidity Aging.....        | +85 °C, 85 % R.H. 1000 hours .....±20 % typical resistance change |
| Passive Aging.....         | +85 °C, 1000 hours.....±20 % typical resistance change            |
| Vibration .....            | MIL-STD-883C, Method 2007.1,.....No change<br>Condition A         |
| Solvent Resistance.....    | MIL-STD-202, Method 215 .....No change                            |

### Test Procedures And Requirements For Model MF-RM Series

| Item                   | Test Conditions                               | Accept/Reject Criteria                   |
|------------------------|-----------------------------------------------|------------------------------------------|
| Visual/Mechanical..... | Verify dimensions and material.....           | Per MF physical description              |
| Resistance.....        | In still air @ 23 °C.....                     | R <sub>min</sub> ≤ R ≤ R <sub>1max</sub> |
| Time to Trip.....      | 240 Vac, specified current .....              | T ≤ max. time to trip                    |
| Hold Current.....      | At I <sub>hold</sub> .....                    | No trip                                  |
| Trip Cycle Life.....   | 240 Vac, I <sub>max</sub> , 100 cycles .....  | No arcing or burning                     |
| Trip Endurance .....   | a) 240 Vac, I <sub>max</sub> , 24 hours ..... | No arcing or burning                     |
|                        | b) 265 Vac, I <sub>max</sub> , 30 mins.       |                                          |
| Solderability .....    | MIL-STD-202, Method 208 .....                 | 95 % min. coverage                       |

UL File Number .....E174545..... <http://www.ul.com/> Follow link to Certifications, then UL File No., enter E174545  
TUV Certificate Number .....50232433 ..... [http://www.tuvdotcom.com/certificates/50232433?locale=en&page\\_number=3](http://www.tuvdotcom.com/certificates/50232433?locale=en&page_number=3)



**WARNING Cancer and Reproductive Harm - [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov)**

\* RoHS Directive 2002/95/EC Jan. 27, 2003 including annex and RoHS Recast 2011/65/EU June 8, 2011.

\*\* Bourns follows the prevailing definition of "halogen free" in the industry. 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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## Advantages

- Resettable feature with overtemperature and overcurrent protection can save expensive components from having to be replaced after tripping, e.g., transformers with built in thermal fuses
- Faster than bimetallic switch designs that take on average approximately 30 seconds to cool down and reset
- Generally lower electromagnetic interference than bimetallic switches

## Benefits

- Reduced repair and replacement costs
- Reduced nuisance tripping
- Combined overcurrent and overtemperature protector in one device

## MF-RM Series - PTC Resettable Fuses

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Thermal Derating Chart - I<sub>hold</sub> (Amps)

| Model        | Ambient Operating Temperature |      |       |       |       |       |       |       |
|--------------|-------------------------------|------|-------|-------|-------|-------|-------|-------|
|              | -20 °C                        | 0 °C | 23 °C | 40 °C | 50 °C | 60 °C | 70 °C | 85 °C |
| MF-RM005/240 | 0.08                          | 0.06 | 0.05  | 0.04  | 0.04  | 0.03  | 0.03  | 0.02  |
| MF-RM008/240 | 0.12                          | 0.10 | 0.08  | 0.07  | 0.06  | 0.05  | 0.04  | 0.03  |
| MF-RM012/240 | 0.18                          | 0.15 | 0.12  | 0.10  | 0.09  | 0.07  | 0.06  | 0.04  |
| MF-RM016/240 | 0.24                          | 0.20 | 0.16  | 0.13  | 0.11  | 0.10  | 0.08  | 0.05  |
| MF-RM025/240 | 0.38                          | 0.32 | 0.25  | 0.21  | 0.18  | 0.15  | 0.13  | 0.09  |
| MF-RM033/240 | 0.50                          | 0.42 | 0.33  | 0.27  | 0.23  | 0.20  | 0.17  | 0.11  |
| MF-RM040/240 | 0.61                          | 0.51 | 0.40  | 0.33  | 0.28  | 0.24  | 0.20  | 0.14  |
| MF-RM055/240 | 0.80                          | 0.68 | 0.55  | 0.46  | 0.40  | 0.35  | 0.29  | 0.22  |

Product Dimensions

| Model        | A<br>Max.       | B<br>Max.       | C              |                | D<br>Min.      | E<br>Max.      | Physical Characteristics |                 |          |
|--------------|-----------------|-----------------|----------------|----------------|----------------|----------------|--------------------------|-----------------|----------|
|              |                 |                 | Nom.           | Tol. ±         |                |                | Style                    | Lead Dia.       | Material |
| MF-RM005/240 | 8.3<br>(0.327)  | 12.9<br>(0.508) | 5.1<br>(0.201) | 0.7<br>(0.028) | 7.6<br>(0.299) | 3.8<br>(0.150) | 1                        | 0.51<br>(0.020) | Sn/Cu    |
| MF-RM008/240 | 8.3<br>(0.327)  | 12.9<br>(0.508) | 5.1<br>(0.201) | 0.7<br>(0.028) | 7.6<br>(0.299) | 3.8<br>(0.150) | 1                        | 0.51<br>(0.020) | Sn/Cu    |
| MF-RM012/240 | 8.3<br>(0.327)  | 12.9<br>(0.508) | 5.1<br>(0.201) | 0.7<br>(0.028) | 7.6<br>(0.299) | 3.8<br>(0.150) | 1                        | 0.51<br>(0.020) | Sn/Cu    |
| MF-RM016/240 | 9.9<br>(0.390)  | 13.8<br>(0.543) | 5.1<br>(0.201) | 0.7<br>(0.028) | 7.6<br>(0.299) | 3.8<br>(0.150) | 1                        | 0.51<br>(0.020) | Sn/Cu    |
| MF-RM025/240 | 10.0<br>(0.394) | 20.0<br>(0.787) | 5.1<br>(0.201) | 0.7<br>(0.028) | 7.6<br>(0.299) | 3.8<br>(0.150) | 2                        | 0.65<br>(0.026) | Sn/Cu    |
| MF-RM033/240 | 11.4<br>(0.449) | 20.0<br>(0.787) | 5.1<br>(0.201) | 0.7<br>(0.028) | 7.6<br>(0.299) | 3.8<br>(0.150) | 2                        | 0.65<br>(0.026) | Sn/Cu    |
| MF-RM040/240 | 11.5<br>(0.453) | 20.9<br>(0.823) | 5.1<br>(0.201) | 0.7<br>(0.028) | 7.6<br>(0.299) | 3.8<br>(0.150) | 2                        | 0.65<br>(0.026) | Sn/Cu    |
| MF-RM055/240 | 14.0<br>(0.551) | 22.4<br>(0.882) | 5.1<br>(0.201) | 0.7<br>(0.028) | 7.6<br>(0.299) | 4.1<br>(0.161) | 2                        | 0.81<br>(0.032) | Sn/Cu    |

Packaging options:

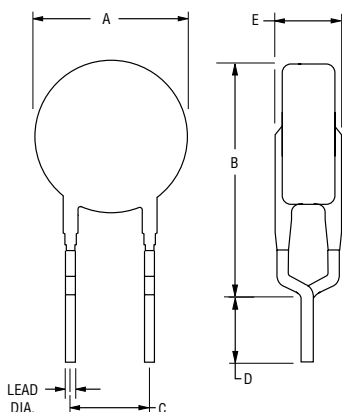
BULK: 500 pcs. per bag.

TAPE & REEL: 2000 pcs. per reel (MF-RM005/240~MF-RM040/240); 1000 pcs. per reel (MF-RM055/240)

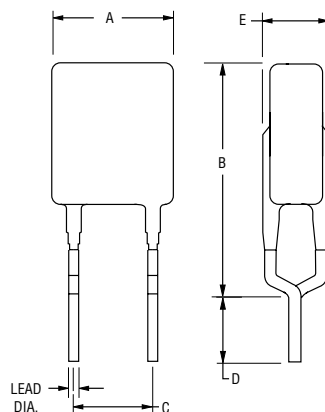
0.51 (24AWG)  
0.65 (22AWG)  
0.81 (20AWG)

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

Style 1



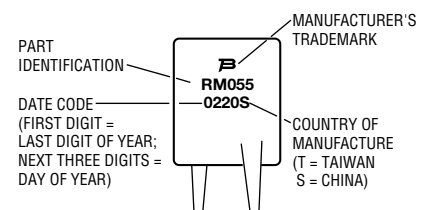
Style 2



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

### Typical Part Marking

Represents total content. Layout may vary.



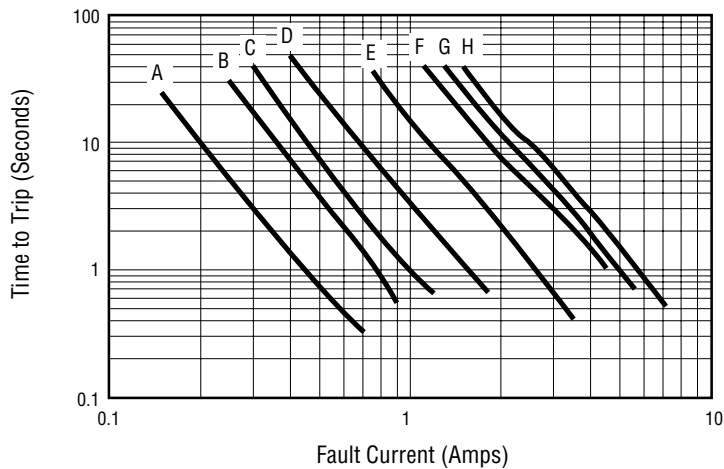
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## MF-RM Series - PTC Resettable Fuses

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### Typical Time to Trip at 23 °C



A = MF-RM005/240  
 B = MF-RM008/240  
 C = MF-RM012/240  
 D = MF-RM016/240  
 E = MF-RM025/240  
 F = MF-RM033/240  
 G = MF-RM040/240  
 H = MF-RM055/240

### How to Order

**MF - RM 005 / 240 - 2 - 17**

Multifuse®  
 Product  
 Designator  
 Series  
 RM = Radial Leaded Component  
 Hold Current,  $I_{hold}$   
 005-055 (0.05 A - 0.55 A)  
 Operating Voltage,  $V_{max}$   
 240 = 240 Vac  
 Packaging Options  
 - 0 = Bulk Packaging  
 - 2 = Tape and Reel  
 Part Number Suffix Option  
 - 17 = Straight Leads in Place of Standard Kinked Leads

\*Packaged per EIA486-B

MF-RM SERIES, REV. F, 09/16

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# MF-RM 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                                        | $D_0$        | $D_0$      | $\frac{4}{(.157)}$     | $\frac{\pm 0.2}{(\pm .079)}$       |
| Abscissa to plane (MF-RM005/240~MF-RM016/240)                 | $H$          | $H$        | $\frac{18.5}{(.728)}$  | $\frac{\pm 3.0}{(\pm .118)}$       |
| Abscissa to plane (MF-RM025/240~MF-RM055/240)                 | $H_0$        | $H_0$      | $\frac{16}{(.63)}$     | $\frac{\pm 0.5}{(\pm .02)}$        |
| Abscissa to top (MF-RM005/240~MF-RM016/240)                   | $H_1$        | $H_1$      | $\frac{32.2}{(1.268)}$ | max.                               |
| Abscissa to top (MF-RM025/240~MF-RM055/240)                   | $H_1$        | $H_1$      | $\frac{45.0}{(1.772)}$ | max.                               |
| Overall width w/lead protrusion (MF-RM005/240~MF-RM016/240)   |              | $C_1$      | $\frac{43.2}{(1.701)}$ | max.                               |
| Overall width w/lead protrusion (MF-RM025/240~MF-RM055/240)   |              | $C_1$      | $\frac{56.0}{(2.205)}$ | max.                               |
| Overall width w/o lead protrusion (MF-RM005/240~MF-RM016/240) |              | $C_2$      | $\frac{42.5}{(1.673)}$ | max.                               |
| Overall width w/o lead protrusion (MF-RM025/240~MF-RM055/240) |              | $C_2$      | $\frac{56.0}{(2.205)}$ | 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                                           | $P_0$        | $P_0$      | $\frac{12.7}{(.500)}$  | $\frac{\pm 0.3}{(\pm .012)}$       |
| Pitch tolerance                                               |              |            | 20 consecutive         | $\frac{\pm 1}{(\pm .039)}$         |
| Device pitch (MF-RM005/240-MF-RM040/240)                      |              |            | $\frac{12.7}{(.500)}$  | $\frac{\pm 0.3}{(\pm .012)}$       |
| Device pitch (MF-RM055/240)                                   |              |            | $\frac{25.4}{(1.00)}$  | $\frac{\pm 0.6}{(\pm .024)}$       |
| Tape thickness                                                | $t$          | $t$        | $\frac{0.9}{(.035)}$   | max.                               |
| Tape thickness with splice (MF-RM005/240~MF-RM040/240)        |              | $t_1$      | $\frac{1.5}{(.059)}$   | max.                               |
| Tape thickness with splice (MF-RM055/240)                     |              | $t_1$      | $\frac{2.3}{(.091)}$   | max.                               |
| Splice sprocket hole alignment                                |              |            | 0                      | $\frac{\pm 0.3}{(\pm .012)}$       |
| Body lateral deviation                                        | $\Delta_h$   | $\Delta_h$ | 0                      | $\frac{\pm 1}{(\pm .039)}$         |
| Body tape plane deviation                                     | $\Delta_p$   | $\Delta_p$ | 0                      | $\frac{\pm 0.3}{(\pm .012)}$       |
| Lead seating plane deviation                                  | $\Delta P_1$ | $P_1$      | $\frac{3.81}{(.015)}$  | $\frac{\pm 0.7}{(\pm .028)}$       |
| Lead spacing                                                  | $F$          | $F$        | $\frac{5.08}{(.200)}$  | $\frac{+0.8/-0.5}{(+.031/-0.020)}$ |

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

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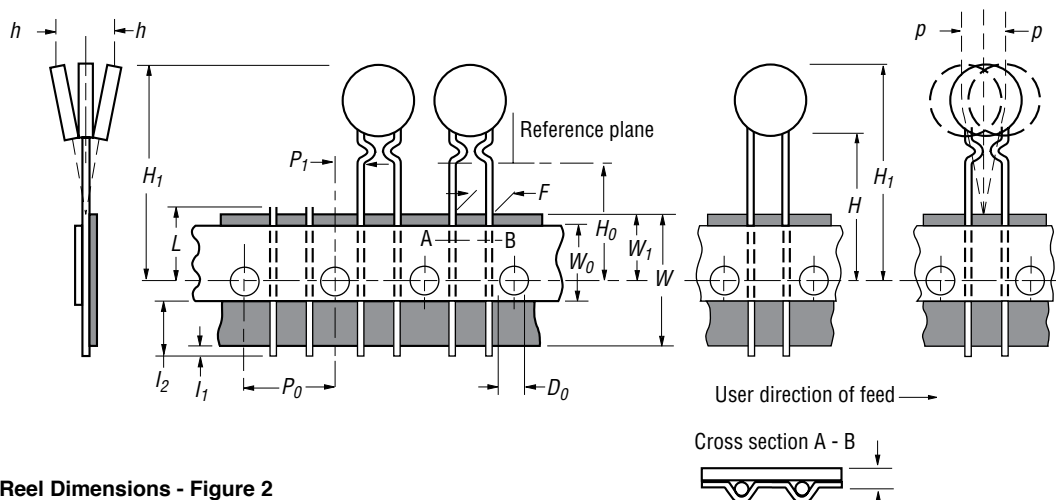
# MF-RM Series Tape and Reel Specifications

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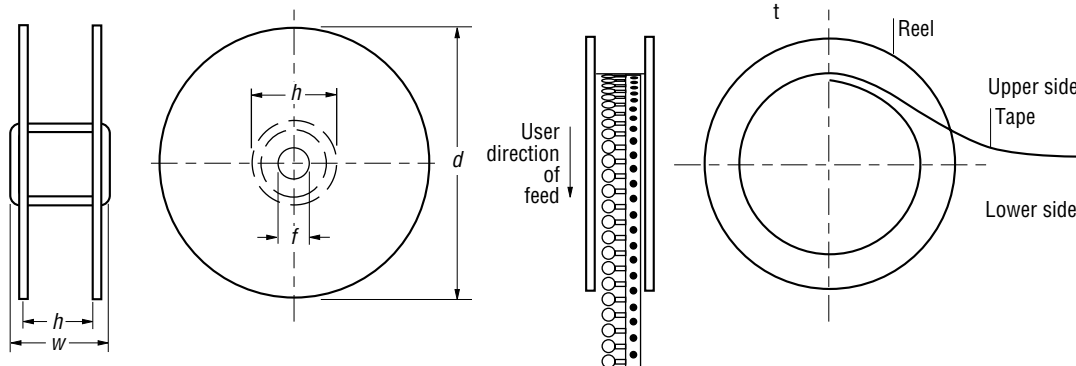
| Dimension Description                             | IEC Mark | EIA Mark | Dimensions                                                   |                             |
|---------------------------------------------------|----------|----------|--------------------------------------------------------------|-----------------------------|
|                                                   |          |          | Dimensions                                                   | Tolerance                   |
| Reel width (MF-RM005/240~MF-RM040/240)            | $w$      | $w_2$    | $\frac{56.0}{(2.20)}$                                        | max.                        |
| Reel width (MF-RM055/240)                         | $w$      | $w_2$    | $\frac{63.5}{(2.50)}$                                        | max.                        |
| Reel diameter                                     | $d$      | $a$      | $\frac{370.0}{(14.57)}$                                      | max.                        |
| Space between flanges (MF-RM005/240~MF-RM040/240) | $h$      | $w_1$    | $\frac{48.0}{(1.89)}$                                        | max.                        |
| Space between flanges (MF-RM055/240)              | $h$      | $w_1$    | $\frac{55.0}{(2.17)}$                                        | max.                        |
| Arbor hole diameter                               | $f$      | $c$      | $\frac{26.0}{(1.02)}$                                        | $\pm 12.0$<br>( $\pm 472$ ) |
| Core diameter                                     | $h$      | $n$      | $\frac{91.0}{(3.58)}$                                        | max.                        |
| Box                                               |          |          | $\frac{64}{(2.5)}$ $\frac{372}{(14.6)}$ $\frac{372}{(14.6)}$ | max.                        |
| Consecutive missing places                        |          |          | 3                                                            | max.                        |
| Empty places per reel                             |          |          | 0.1 %                                                        | max.                        |

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

**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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Unless Bourns has explicitly designated an individual Bourns® product as meeting the requirements of a particular industry standard (e.g., ISO/TS 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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