Features

- Compliant with AEC-Q200 Rev-C- Stress Test Qualification for Passive Components
- Fast tripping resettable circuit protection
- Surface mount packaging for automated assembly
- Small footprint size (1210)
- RoHS compliant* and halogen free**
- Agency recognition: c UL us, TÜV

MF-USMF Series - PTC Resettable Fuses

Electrical Characteristics

Model	V max. Volts	I max. Amps	I_{hold}	I_{trip}	Resistance		Max. Time To Trip		Tripped Power Dissipation
			Amperes at 23 °C		Ohms at 23 °C		Amperes at 23 °C	Seconds at 23 °C	Watts at 23 °C
			Hold	Trip	$R_{Min.}$	$R_{1Max.}$			Typ.
MF-USMF005	30	10	0.05	0.15	2.800	50.000	0.25	1.50	0.6
MF-USMF010	30	10	0.10	0.30	0.800	15.000	0.50	0.60	0.6
MF-USMF020	30	10	0.20	0.40	0.400	5.000	8.00	0.02	0.6
MF-USMF035	6	40	0.35	0.75	0.200	1.300	8.00	0.20	0.6
MF-USMF050	13.2	40	0.50	1.00	0.180	0.900	8.00	0.10	0.6
MF-USMF075	6	40	0.75	1.50	0.070	0.450	8.00	0.10	0.6
MF-USMF110	6	40	1.10	2.20	0.050	0.210	5.00	1.00	0.6
MF-USMF150	6	40	1.50	3.00	0.030	0.110	5.00	5.00	0.6
MF-USMF175	6	40	1.75	3.50	0.020	0.090	8.00	1.00	0.7
MF-USMF175X	6	40	1.75	3.50	0.020	0.090	8.00	1.00	0.7

Environmental Characteristics

Operating 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	+85 °C to -40 °C, 20 times	±10 % typical resistance change
Solvent Resistance	MIL-STD-202, Method 215	No change
Vibration	MIL-STD-883C, Method 2007.1, Condition A	No change
Moisture Sensitivity Level (MSL)	Level 1	
ESD Classification - HBM	Class 6	

Test Procedures And Requirements For Model MF-LSMF Series

Test	Test Conditions	Accept/Reject Criteria
Visual/Mech.	Verify dimensions and materials	Per MF physical description
Resistance	In still air @ 23 °C	Rmin ≤ R ≤ 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	ANSI/J-STD-002	95 % min. coverage

UL File Number ..... E174545 http://www.ul.com/ Follow link to Online Certificates Directory, then enter UL File No. E174545, or click here

TÜV Certificate Number ..... R 02057213 http://www.tuvdotcom.com/ Follow link to "other certificates", enter File No. 2057213, or click here

WARNING Cancer and Reproductive Harm - 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.Specifications are subject to change without notice.

Applications

- Game consoles
- PC motherboards
- USB port protection - USB 2.0, 3.0 & OTG
- HDMI 1.4 Source protection
- IEEE 1394 ports
- Mobile phones
- Digital cameras

MF-USMF Series - PTC Resettable Fuses

BOURNS®

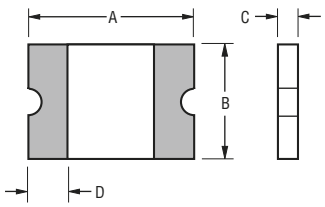
Product Dimensions

Model	A		B		C		D
	Min.	Max.	Min.	Max.	Min.	Max.	Min.
MF-USMF005	3.00 (0.118)	3.43 (0.135)	2.35 (0.093)	2.80 (0.110)	0.80 (0.031)	1.1 (0.043)	0.30 (0.012)
MF-USMF010	3.00 (0.118)	3.43 (0.135)	2.35 (0.093)	2.80 (0.110)	0.80 (0.031)	1.1 (0.043)	0.30 (0.012)
MF-USMF020	3.00 (0.118)	3.43 (0.135)	2.35 (0.093)	2.80 (0.110)	0.80 (0.031)	1.1 (0.043)	0.30 (0.012)
MF-USMF035	3.00 (0.118)	3.43 (0.135)	2.35 (0.093)	2.80 (0.110)	0.55 (0.022)	0.85 (0.033)	0.30 (0.012)
MF-USMF050	3.00 (0.118)	3.43 (0.135)	2.35 (0.093)	2.80 (0.110)	0.55 (0.022)	0.85 (0.033)	0.30 (0.012)
MF-USMF075	3.00 (0.118)	3.43 (0.135)	2.35 (0.093)	2.80 (0.110)	0.55 (0.022)	0.85 (0.033)	0.30 (0.012)
MF-USMF110	3.00 (0.118)	3.43 (0.135)	2.35 (0.093)	2.80 (0.110)	0.55 (0.022)	0.85 (0.033)	0.30 (0.012)
MF-USMF150	3.00 (0.118)	3.43 (0.135)	2.35 (0.093)	2.80 (0.110)	0.40 (0.016)	0.85 (0.033)	0.30 (0.012)
MF-USMF175X	3.00 (0.118)	3.43 (0.135)	2.35 (0.093)	2.80 (0.110)	0.40 (0.016)	0.85 (0.033)	0.30 (0.012)
MF-USMF175X	3.00 (0.118)	3.43 (0.135)	2.35 (0.093)	2.80 (0.110)	0.40 (0.016)	0.85 (0.033)	0.30 (0.012)

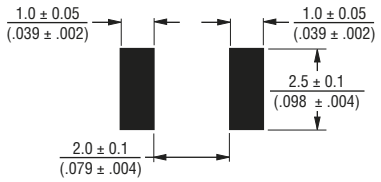
Packaging: 3000 pcs. per reel.

DIMENSIONS: MM (INCHES)

Top and Bottom View *Side View*



Recommended Pad Layout

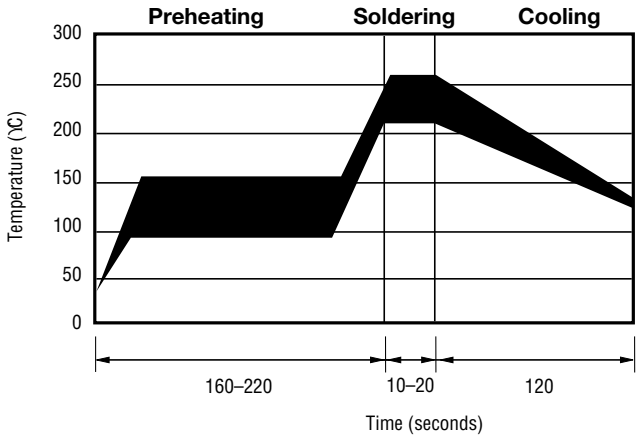


Terminal material:
Electroless Ni under immersion Au

Termination pad solderability:
Standard Au finish:
Meets ANSI/J-STD-002 Category 2.

Recommended Storage:
40 °C max./70 % RH max.

Solder Reflow Recommendations



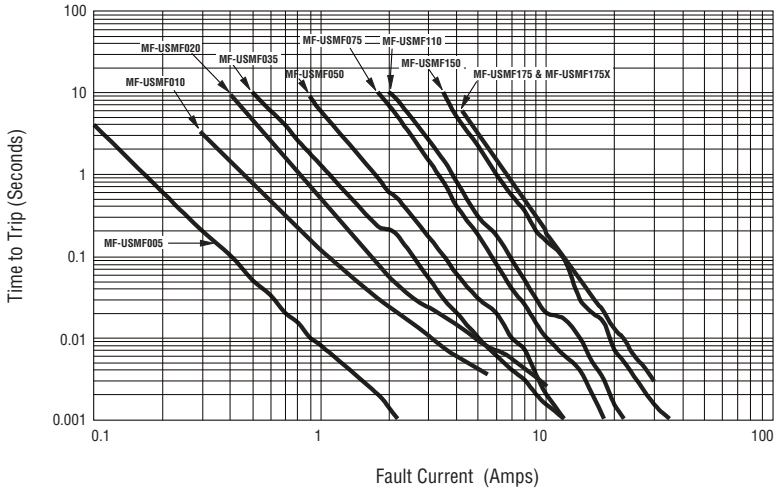
Notes:

- MF-USMF models cannot be wave soldered.
- If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.
- Compatible with Pb and Pb-free solder reflow profiles.
- Excess solder may cause a short circuit, especially during hand soldering. Please refer to the Multifuse® Polymer PTC Soldering Recommendation guidelines.

Thermal Derating Chart - 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-USMF005	0.08	0.07	0.06	0.05	0.04	0.04	0.03	0.03	0.02
MF-USMF010	0.15	0.13	0.12	0.10	0.09	0.08	0.07	0.06	0.05
MF-USMF020	0.32	0.28	0.24	0.20	0.18	0.16	0.14	0.12	0.10
MF-USMF035	0.51	0.46	0.40	0.34	0.30	0.27	0.24	0.22	0.18
MF-USMF050	0.76	0.66	0.58	0.48	0.42	0.38	0.35	0.29	0.23
MF-USMF075	1.10	0.97	0.86	0.72	0.64	0.58	0.55	0.47	0.39
MF-USMF110	1.60	1.42	1.26	1.10	0.94	0.86	0.80	0.70	0.58
MF-USMF150	2.30	2.02	1.76	1.43	1.24	1.11	1.00	0.85	0.65
MF-USMF175	2.80	2.45	2.10	1.75	1.55	1.45	1.35	1.25	1.10
MF-USMF175X	2.80	2.45	2.10	1.75	1.55	1.45	1.35	1.25	1.10

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.

How to Order

MF - USMF 010 X - 2

Multifuse® Product Designator

Series
USMF = 1210 Surface Mount Component

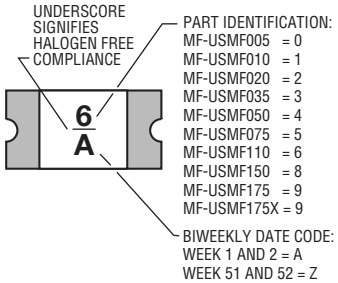
Hold Current, Ihold
005-175 (0.05-1.75 Amps)

Multifuse® freeXpansion™ Design

Packaging
Packaged per EIA 481-1
-2 = Tape and Reel

Typical Part Marking

Represents total content. Layout may vary.

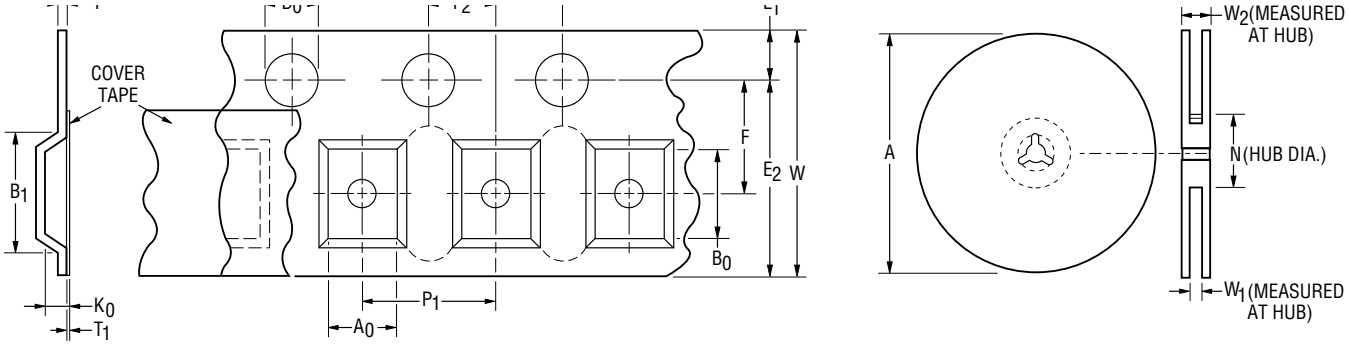


MF-USMF Series Tape and Reel Specifications

BOURNS®

Tape Dimensions	MF-USMF Series per EIA 481-2
W	8.0 ± 0.3 (0.315 ± 0.012)
P_0	4.0 ± 0.1 (0.157 ± 0.004)
P_1	4.0 ± 0.1 (0.157 ± 0.004)
P_2	2.0 ± 0.05 (0.079 ± 0.002)
A_0	2.76 ± 0.10 (0.109 ± 0.004)
B_0	3.50 ± 0.10 (0.138 ± 0.004)
B_1 max.	4.35 (0.171)
D_0	1.5 + 0.1/-0.0 (0.059 + 0.004/-0)
F	3.5 ± 0.05 (0.138 + 0.002)
E_1	1.75 ± 0.10 (0.069 ± 0.004)
E_2 min.	6.25 (0.246)
T max.	0.6 (0.024)
T_1 max.	0.1 (0.004)
K_0	1.07 ± 0.10 (0.042 ± 0.004)
Leader min.	390 (15.35)
Trailer min.	160 (6.30)
Reel Dimensions	
A max.	185 (7.283)
N min.	50 (1.97)
W_1	8.4 + 1.5/ -0.0 (0.331 + 0.059/-0)
W_2 max.	14.4 (0.567)

DIMENSIONS: MM (INCHES)



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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