



Features

- Very small size 1210 footprint - 44 % smaller design than MF-MSMD Series
- Fast tripping resettable circuit protection
- Surface mount packaging for automated assembly
- Agency recognition:   



The MF-USMD Series is currently available, although not recommended for new designs. The MF-USMF Series is preferred.

BOURNS®

MF-USMD 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-USMD005	30.0	10	0.05	0.15	2.80	50.0	0.25	1.5	0.8
MF-USMD010	30.0	10	0.10	0.30	0.80	15.0	0.5	0.6	0.8
MF-USMD020	30.0	10	0.20	0.40	0.40	5.00	8.0	0.02	0.8
MF-USMD035	6.0	40	0.35	0.75	0.20	1.30	8.0	0.2	1.0
MF-USMD050	13.2	40	0.50	1.00	0.18	0.90	8.0	0.1	1.0
MF-USMD075	6.0	40	0.75	1.50	0.07	0.450	8.0	0.1	1.2
MF-USMD110	6.0	40	1.10	2.20	0.05	0.210	5.0	1.0	1.2

Environmental Characteristics

Operating/Storage Temperature-40 °C to +85 °C
 Maximum Device Surface Temperature
 in Tripped State125 °C
 Passive Aging.....+85 °C, 1000 hours±5 % typical resistance change
 Humidity Aging.....+85 °C, 85 % R.H. 1000 hours.....±10 % typical resistance change
 Thermal Shock.....+85 °C to -40 °C, 20 times.....±10 % typical resistance change
 Solvent ResistanceMIL-STD-202, Method 215No change
 VibrationMIL-STD-883C, Method 2007.1,No change
 Condition A

Test Procedures And Requirements For Model MF-USMD Series

Test	Test Conditions	Accept/Reject Criteria
Visual/Mech.....	Verify dimensions and materials	Per MF physical description
Resistance.....	In still air @ 23 °C.....	R _{min} ≤ R ≤ R _{1max}
Time to Trip.....	At specified current, 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.....	MIL-STD-202F, Method 208F	95 % min. coverage

UL File NumberE174545
<http://www.ul.com/> Follow link to Certifications, then UL File No., enter E174545
 CSA File NumberCA110338
<http://directories.csa-international.org/> Under "Certification Record" and "File Number" enter 110338-0-000
 TÜV Certificate NumberR 02057213
<http://www.tuvdotcom.com/> Follow link to "other certificates", enter File No. 2057213

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-USMD005	0.08	0.07	0.06	0.05	0.04	0.04	0.03	0.03	0.02
MF-USMD010	0.16	0.14	0.12	0.10	0.08	0.07	0.06	0.05	0.04
MF-USMD020	0.32	0.28	0.24	0.20	0.16	0.14	0.12	0.10	0.06
MF-USMD035	0.47	0.45	0.40	0.35	0.33	0.28	0.24	0.21	0.18
MF-USMD050	0.76	0.67	0.58	0.50	0.43	0.40	0.36	0.32	0.28
MF-USMD075	1.00	0.97	0.86	0.75	0.64	0.59	0.54	0.48	0.40
MF-USMD110	1.60	1.42	1.26	1.10	0.94	0.86	0.80	0.70	0.58

Specifications are subject to change without notice.
 Customers should verify actual device performance in their specific applications.

Additional Features

- Patents pending

Applications

- PC motherboards
- PC modems
- USB
- Analog and digital line cards
- IEEE 1394
- General electronics: Phones, fax machines, televisions, printers, video equipment

MF-USMD Series - PTC Resettable Fuses

BOURNS®

Product Dimensions

Model	A		B		C		D
	Min.	Max.	Min.	Max.	Min.	Max.	Min.
MF-USMD005	$\frac{3.00}{(0.118)}$	$\frac{3.43}{(0.135)}$	$\frac{2.35}{(0.093)}$	$\frac{2.80}{(0.110)}$	$\frac{0.50}{(0.020)}$	$\frac{0.85}{(0.033)}$	$\frac{0.30}{(0.012)}$
MF-USMD010	$\frac{3.00}{(0.118)}$	$\frac{3.43}{(0.135)}$	$\frac{2.35}{(0.093)}$	$\frac{2.80}{(0.110)}$	$\frac{0.50}{(0.020)}$	$\frac{0.85}{(0.033)}$	$\frac{0.30}{(0.012)}$
MF-USMD020	$\frac{3.00}{(0.118)}$	$\frac{3.43}{(0.135)}$	$\frac{2.35}{(0.093)}$	$\frac{2.80}{(0.110)}$	$\frac{0.50}{(0.020)}$	$\frac{0.85}{(0.033)}$	$\frac{0.30}{(0.012)}$
MF-USMD035	$\frac{3.00}{(0.118)}$	$\frac{3.43}{(0.135)}$	$\frac{2.35}{(0.093)}$	$\frac{2.80}{(0.110)}$	$\frac{0.38}{(0.015)}$	$\frac{0.62}{(0.025)}$	$\frac{0.30}{(0.012)}$
MF-USMD050	$\frac{3.00}{(0.118)}$	$\frac{3.43}{(0.135)}$	$\frac{2.35}{(0.093)}$	$\frac{2.80}{(0.110)}$	$\frac{0.38}{(0.015)}$	$\frac{0.62}{(0.024)}$	$\frac{0.30}{(0.012)}$
MF-USMD075	$\frac{3.00}{(0.118)}$	$\frac{3.43}{(0.135)}$	$\frac{2.35}{(0.093)}$	$\frac{2.80}{(0.110)}$	$\frac{0.38}{(0.015)}$	$\frac{0.62}{(0.025)}$	$\frac{0.30}{(0.012)}$
MF-USMD110	$\frac{3.00}{(0.118)}$	$\frac{3.43}{(0.135)}$	$\frac{2.35}{(0.093)}$	$\frac{2.80}{(0.110)}$	$\frac{0.30}{(0.012)}$	$\frac{0.48}{(0.019)}$	$\frac{0.30}{(0.012)}$

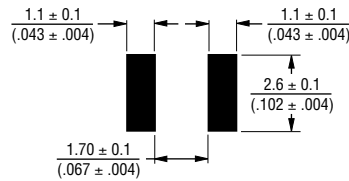
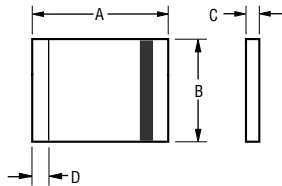
Packaging: 3000 pcs. per reel.

UNIT = $\frac{\text{MM}}{\text{(INCHES)}}$

Top and Bottom View

Side View

Recommended Pad Layout

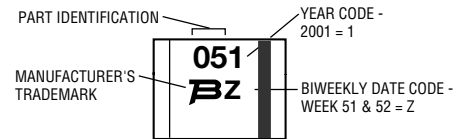


Terminal material: solder-plated copper

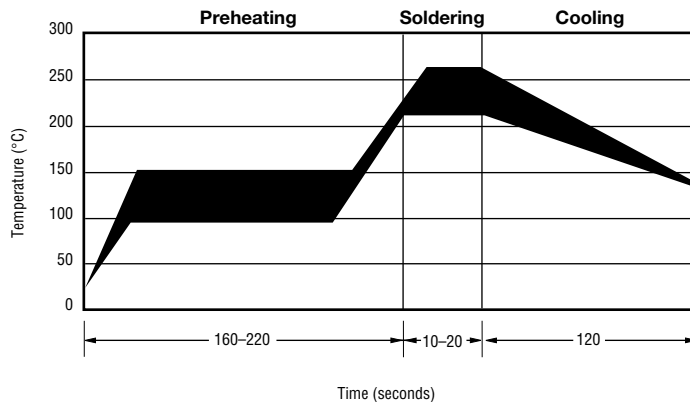
Termination pad solderability: Meets EIA Specification RS-186-9E, ANSI/J-STD-002 Category 3.

Typical Part Marking

Represents total content. Layout may vary.



Solder Reflow Recommendations



Note:

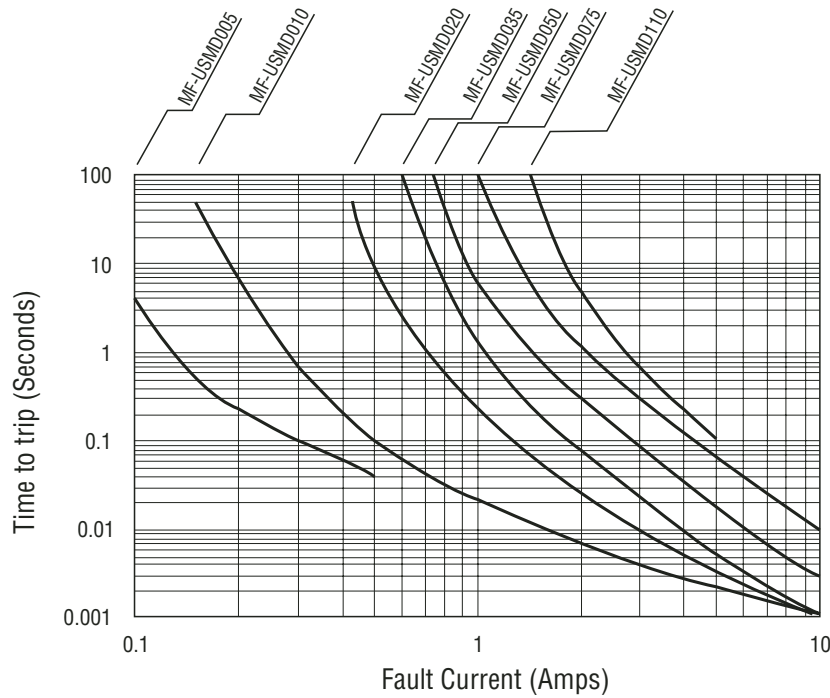
- MF-USMD models can be wave soldered and reworked.
- If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.

Specifications are subject to change without notice. Customers should verify actual device performance in their specific applications.

MF-USMD Series - PTC Resettable Fuses

BOURNS®

Typical Time to Trip at 23 °C



How to Order

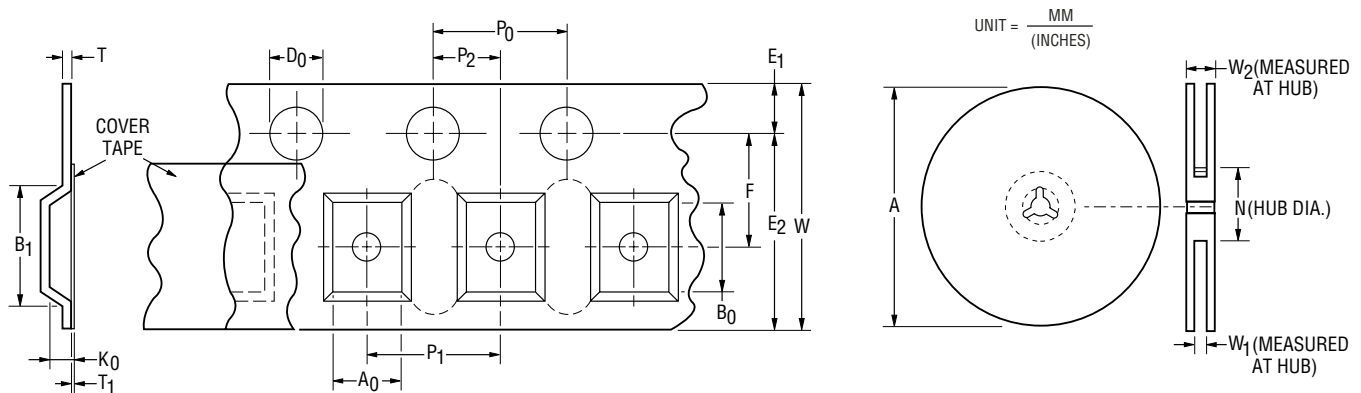
MF - USMD 005 - 2

Multifuse® Product
 Designator _____
 Series _____
 USMD = 1210 Surface Mount Component
 Hold Current, I_{hold}
 005-110 (0.05 Amps - 1.10 Amps)
 Packaging _____
 Packaged per EIA 481-1
 -2 = Tape and Reel

MF-MSMD, MF-USMD & MF-ESMD Series Tape and Reel Specs

BOURNS®

Tape Dimensions	MF-MSMD Series per EIA-481-1	MF-USMD Series per EIA 481-1	MF-ESMD Series per EIA 481-2
W	$\frac{12.0 \pm 0.30}{(0.472 \pm 0.012)}$	$\frac{8.0 \pm 0.30}{(0.315 \pm 0.012)}$	$\frac{24.0 \pm 0.3}{(0.945 \pm 0.012)}$
P ₀	$\frac{4.0 \pm 0.10}{(0.157 \pm 0.004)}$	$\frac{4.0 \pm 0.10}{(0.157 \pm 0.004)}$	$\frac{4.0 \pm 0.1}{(0.157 \pm 0.004)}$
P ₁	$\frac{8.0 \pm 0.10}{(0.315 \pm 0.004)}$	$\frac{4.0 \pm 0.10}{(0.157 \pm 0.004)}$	$\frac{8.0 \pm 0.1}{(0.315 \pm 0.004)}$
P ₂	$\frac{2.0 \pm 0.05}{(0.079 \pm 0.002)}$	$\frac{2.0 \pm 0.05}{(0.079 \pm 0.002)}$	$\frac{2.0 \pm 0.1}{(0.079 \pm 0.004)}$
A ₀	$\frac{3.66 \pm 0.15}{(0.144 \pm 0.006)}$	$\frac{2.92 \pm 0.10}{(0.115 \pm 0.004)}$	$\frac{5.65 \pm 0.1}{(0.222 \pm 0.004)}$
B ₀	$\frac{4.98 \pm 0.10}{(0.196 \pm 0.004)}$	$\frac{3.57 \pm 0.1}{(0.141 \pm 0.004)}$	$\frac{11.86 \pm 0.1}{(0.467 \pm 0.004)}$
B ₁ max.	$\frac{5.9}{(0.232)}$	$\frac{4.35}{(0.171)}$	$\frac{20.1}{(0.791)}$
D ₀	$\frac{1.5 + 0.10/-0.00}{(0.059 + 0.004/-0)}$	$\frac{1.50 + 0.1/-0.0}{(0.059 + 0.004/-0)}$	$\frac{1.5 + 0.1/-0.0}{(0.059 + 0.004/-0)}$
F	$\frac{5.5 \pm 0.05}{(0.217 \pm 0.002)}$	$\frac{3.5 \pm 0.05}{(0.138 \pm 0.002)}$	$\frac{11.5 \pm 0.10}{(0.453 \pm 0.004)}$
E ₁	$\frac{1.75 \pm 0.10}{(0.069 \pm 0.004)}$	$\frac{1.75 \pm 0.10}{(0.069 \pm 0.004)}$	$\frac{1.75 \pm 0.10}{(0.069 \pm 0.004)}$
E ₂ min.	$\frac{10.25}{(0.404)}$	$\frac{6.25}{(0.246)}$	$\frac{22.25}{(0.876)}$
T max.	$\frac{0.6}{(0.024)}$	$\frac{0.6}{(0.024)}$	$\frac{0.6}{(0.024)}$
T ₁ max.	$\frac{0.1}{(0.004)}$	$\frac{0.1}{(0.004)}$	$\frac{0.1}{(0.004)}$
K ₀	$\frac{0.95 \pm 0.10}{(0.037 \pm 0.004)}$	$\frac{0.82 \pm 0.10}{(0.032 \pm 0.004)}$	$\frac{0.85 \pm 0.1}{(0.033 \pm 0.004)}$
Leader min.	$\frac{390}{(15.35)}$	$\frac{390}{(15.35)}$	$\frac{390}{(15.35)}$
Trailer min.	$\frac{160}{(6.30)}$	$\frac{160}{(6.30)}$	$\frac{160}{(6.30)}$
Reel Dimensions			
A max.	$\frac{185}{(7.28)}$	$\frac{185}{(7.28)}$	$\frac{360}{(14.17)}$
N min.	$\frac{50}{(1.97)}$	$\frac{50}{(1.97)}$	$\frac{60}{(2.36)}$
W ₁	$\frac{12.4 + 2.0/-0.0}{(0.488 + 0.079/-0.0)}$	$\frac{8.4 + 1.5/-0.0}{(0.331 + 0.059/-0)}$	$\frac{24.4 + 2.0/-0.0}{(0.961 + 0.079/-0)}$
W ₂ max.	$\frac{18.4}{(0.724)}$	$\frac{14.4}{(0.567)}$	$\frac{30.4}{(1.20)}$



Specifications are subject to change without notice.
Customers should verify actual device performance in their specific applications.