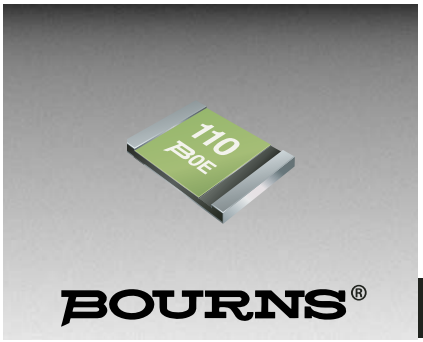

BOURNS®

Features

- 4.5 mm SMD
- Fast tripping resettable circuit protection
- Surface mount packaging for automated assembly
- Reduced component size and resistance
- Agency recognition:

Applications

High Density Circuit Board Applications:

- Hard disk drives
- PC motherboards
- PC peripherals
- Point-of-sale (POS) equipment
- PCMCIA cards

MF-MSMD 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-MSMD010	60.0	40	0.10	0.30	0.70	15.00	0.5	1.5	1.0
MF-MSMD014	60.0	40	0.14	0.34	0.40	6.50	1.5	0.15	1.0
MF-MSMD020	30.0	80	0.20	0.40	0.40	6.00	6.0	0.06	1.0
MF-MSMD030	30.0	10	0.30	0.60	0.30	3.00	8.0	0.10	1.2
MF-MSMD050	15.0	100	0.50	1.00	0.15	1.00	8.0	0.15	1.2
MF-MSMD075	13.2	100	0.75	1.50	0.11	0.45	8.0	0.20	1.2
MF-MSMD110	6.0	100	1.10	2.20	0.04	0.21	8.0	0.30	1.2
MF-MSMD125	6.0	100	1.25	2.50	0.035	0.14	8.0	0.4	1.5
MF-MSMD150	6.0	100	1.50	3.00	0.03	0.120	8.0	0.5	1.5
MF-MSMD160	8.0	100	1.60	2.80	0.035	0.099	8.0	2.0	1.5
MF-MSMD200	6.0	100	2.00	4.00	0.020	0.100	8.0	3.0	1.5
MF-MSMD260	6.0	100	2.60	5.20	0.015	0.080	8.0	5.0	1.5

Environmental Characteristics

Operating/Storage Temperature .....-40 °C to +85 °C
Maximum Device Surface Temperature
in Tripped State .....125 °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, ...No change
Condition A

Test Procedures And Requirements For Model MF-MSMD 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	MIL-STD-202F, Method 208F	95 % min. coverage

UL File Number E174545
http://www.ul.com/ Follow link to Certifications, then UL File No., enter E174545
CSA File Number CA110338
http://directories.csa-international.org/ Under “Certification Record” and “File Number” enter 110338-0-000
TÜV Certificate Number.....R 02057213
http://www.tuvdotcom.com/ Follow link to “other certificates”, enter File No. 2057213

Additional Features

■ Patents pending

MF-MSMD Series - PTC Resettable Fuses

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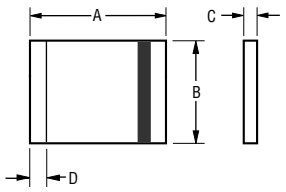
Product Dimensions

Model	A		B		C		D
	Min.	Max.	Min.	Max.	Min.	Max.	Min.
MF-MSMD010	4.37 (0.172)	4.73 (0.186)	3.07 (0.121)	3.41 (0.134)	0.56 (0.022)	0.81 (0.032)	0.30 (0.012)
MF-MSMD014	4.37 (0.172)	4.73 (0.186)	3.07 (0.121)	3.41 (0.134)	0.56 (0.022)	0.81 (0.032)	0.30 (0.012)
MF-MSMD020	4.37 (0.172)	4.73 (0.186)	3.07 (0.121)	3.41 (0.134)	0.56 (0.022)	0.81 (0.032)	0.30 (0.012)
MF-MSMD030	4.37 (0.172)	4.73 (0.186)	3.07 (0.121)	3.41 (0.134)	0.56 (0.022)	0.81 (0.032)	0.30 (0.012)
MF-MSMD050	4.37 (0.172)	4.73 (0.186)	3.07 (0.121)	3.41 (0.134)	0.38 (0.015)	0.62 (0.024)	0.30 (0.012)
MF-MSMD075	4.37 (0.172)	4.73 (0.186)	3.07 (0.121)	3.41 (0.134)	0.38 (0.015)	0.62 (0.024)	0.30 (0.012)
MF-MSMD110	4.37 (0.172)	4.73 (0.186)	3.07 (0.121)	3.41 (0.134)	0.38 (0.015)	0.62 (0.024)	0.30 (0.012)
MF-MSMD125	4.37 (0.172)	4.73 (0.186)	3.07 (0.121)	3.41 (0.134)	0.30 (0.012)	0.48 (0.019)	0.30 (0.012)
MF-MSMD150	4.37 (0.172)	4.73 (0.186)	3.07 (0.121)	3.41 (0.134)	0.30 (0.012)	0.48 (0.019)	0.30 (0.012)
MF-MSMD160	4.37 (0.172)	4.73 (0.186)	3.07 (0.121)	3.41 (0.134)	0.30 (0.012)	0.48 (0.019)	0.30 (0.012)
MF-MSMD200	4.37 (0.172)	4.73 (0.186)	3.07 (0.121)	3.41 (0.134)	0.30 (0.012)	0.48 (0.019)	0.30 (0.012)
MF-MSMD260	4.37 (0.172)	4.73 (0.186)	3.07 (0.121)	3.41 (0.134)	0.25 (0.010)	0.48 (0.019)	0.30 (0.012)

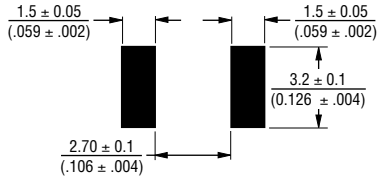
Packaging: 2000 pcs. per reel.

UNIT = MM (INCHES)

Top and Bottom View ***Side View***

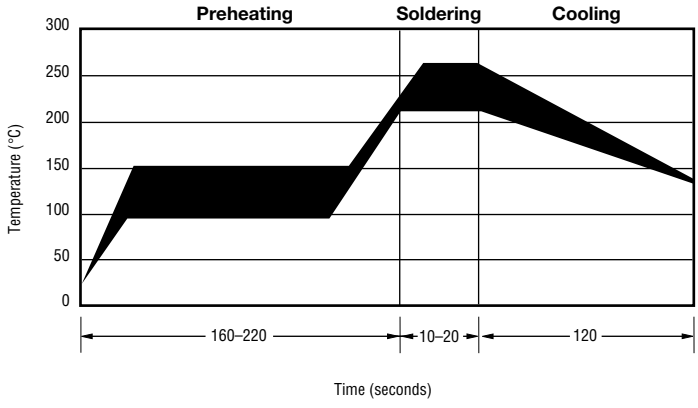


Recommended Pad Layout



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

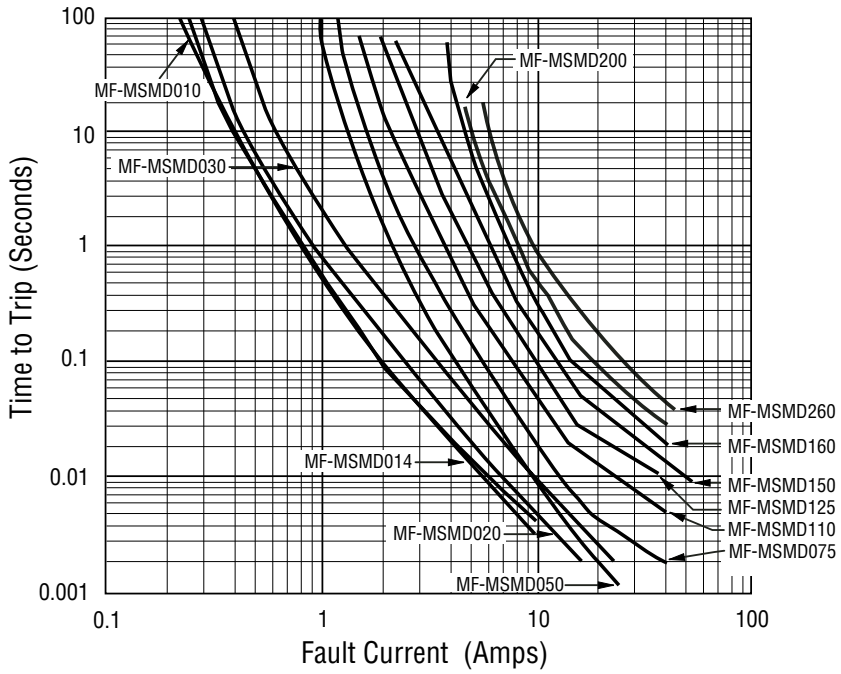
Solder Reflow Recommendations



Note:

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

Typical Time to Trip at 23 °C



How to Order

MF - MSMD 075 - 2

Multifuse® Product Designator

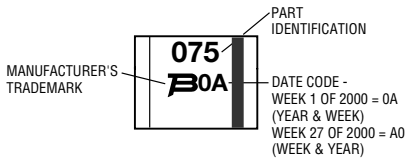
Series
MSMD = 4.5 mm Surface Mount Component

Hold Current, I_{hold}
010-260 (0.10 Amps - 2.60 Amps)

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

Typical Part Marking

Represents total content. Layout may vary.



Thermal Derating Chart - I_{hold} / I_{trip} (Amps)

Model	Ambient Operating Temperature								
	-40 °C	-20 °C	0 °C	23 °C	40 °C	50 °C	60 °C	70 °C	85 °C
MF-MSMD010	0.16 / 0.32	0.14 / 0.28	0.12 / 0.24	0.11 / 0.22	0.08 / 0.16	0.07 / 0.14	0.06 / 0.12	0.05 / 0.10	0.03 / 0.06
MF-MSMD014	0.23 / 0.52	0.19 / 0.45	0.17 / 0.40	0.14 / 0.34	0.12 / 0.29	0.10 / 0.25	0.09 / 0.23	0.08 / 0.21	0.06 / 0.16
MF-MSMD020	0.29 / 0.58	0.26 / 0.52	0.23 / 0.46	0.20 / 0.40	0.17 / 0.34	0.15 / 0.30	0.14 / 0.28	0.12 / 0.24	0.10 / 0.20
MF-MSMD030	0.44 / 0.88	0.39 / 0.78	0.35 / 0.70	0.30 / 0.60	0.26 / 0.52	0.23 / 0.46	0.21 / 0.42	0.18 / 0.36	0.15 / 0.30
MF-MSMD050	0.77 / 1.54	0.68 / 1.36	0.59 / 1.18	0.50 / 1.00	0.44 / 0.88	0.40 / 0.80	0.37 / 0.74	0.33 / 0.66	0.29 / 0.58
MF-MSMD075	1.15 / 2.30	1.01 / 2.02	0.88 / 1.76	0.75 / 1.50	0.65 / 1.30	0.60 / 1.20	0.55 / 1.10	0.49 / 0.98	0.43 / 0.86
MF-MSMD110	1.59 / 3.18	1.43 / 2.86	1.26 / 2.52	1.10 / 2.20	0.95 / 1.90	0.87 / 1.74	0.80 / 1.60	0.71 / 1.42	0.60 / 1.20
MF-MSMD125	1.80 / 3.61	1.63 / 3.25	1.43 / 2.86	1.25 / 2.50	1.08 / 2.16	0.99 / 1.98	0.91 / 1.82	0.81 / 1.62	0.68 / 1.36
MF-MSMD150	2.17 / 4.34	1.95 / 3.90	1.72 / 3.44	1.50 / 3.00	1.30 / 2.59	1.18 / 2.37	1.09 / 2.18	0.97 / 1.94	0.82 / 1.64
MF-MSMD160	2.30 / 5.00	2.20 / 4.40	1.90 / 3.80	1.60 / 2.80	1.45 / 2.90	1.30 / 2.60	1.15 / 2.30	1.03 / 2.06	0.91 / 1.82
MF-MSMD200	3.08 / 6.14	2.71 / 5.39	2.35 / 4.62	2.00 / 4.01	1.80 / 1.61	1.60 / 3.19	1.50 / 2.98	1.07 / 2.12	0.80 / 1.58
MF-MSMD260	4.00 / 7.98	3.52 / 7.01	3.06 / 6.09	2.60 / 5.15	2.34 / 4.64	2.08 / 4.13	1.95 / 3.87	1.39 / 2.74	1.04 / 2.05

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

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Tape Dimensions	MF-MSMD Series per EIA-481-1	MF-USMD Series per EIA 481-1	MF-ESMD Series per EIA 481-2
W	12.0 ± 0.30 (0.472 ± 0.012)	8.0 ± 0.30 (0.315 ± 0.012)	24.0 ± 0.3 (0.945 ± 0.012)
P_0	4.0 ± 0.10 (0.157 ± 0.004)	4.0 ± 0.10 (0.157 ± 0.004)	4.0 ± 0.1 (0.157 ± 0.004)
P_1	8.0 ± 0.10 (0.315 ± 0.004)	4.0 ± 0.10 (0.157 ± 0.004)	8.0 ± 0.1 (0.315 ± 0.004)
P_2	2.0 ± 0.05 (0.079 ± 0.002)	2.0 ± 0.05 (0.079 ± 0.002)	2.0 ± 0.1 (0.079 ± 0.004)
A_0	3.66 ± 0.15 (0.144 ± 0.006)	MF-USMD005,010,020: 2.76 ± 0.10 (0.109 ± 0.004) MF-USMD035,050,075,110: 2.93 ± 0.15 (0.115 ± 0.006)	5.65 ± 0.1 (0.222 ± 0.004)
B_0	4.98 ± 0.10 (0.196 ± 0.004)	MF-USMD005,010,020: 3.5 ± 0.1 (0.138 ± 0.004) MF-USMD035,050,075,110: 3.56 ± 0.1 (0.140 ± 0.004)	11.86 ± 0.1 (0.467 ± 0.004)
B_1 max.	5.9 (0.232)	4.35 (0.171)	20.1 (0.791)
D_0	1.5 + 0.10/-0.00 (0.059 + 0.004/-0)	1.50 + 0.1/-0.0 (0.059 + 0.004/-0)	1.5 + 0.1/-0.0 (0.059 + 0.004/-0)
F	5.5 ± 0.05 (0.217 ± 0.002)	3.5 ± 0.05 (0.138 ± 0.002)	11.5 ± 0.10 (0.453 ± 0.004)
E_1	1.75 ± 0.10 (0.069 ± 0.004)	1.75 ± 0.10 (0.069 ± 0.004)	1.75 ± 0.10 (0.069 ± 0.004)
E_2 min.	10.25 (0.404)	6.25 (0.246)	22.25 (0.876)
T max.	0.6 (0.024)	0.6 (0.024)	0.6 (0.024)
T_1 max.	0.1 (0.004)	0.1 (0.004)	0.1 (0.004)
K_0	0.95 ± 0.10 (0.037 ± 0.004)	MF-USMD005,010,020: 1.07 ± 0.10 (0.042 ± 0.004) MF-USMD035,050,075,110: 0.75 ± 0.10 (0.030 ± 0.004)	0.85 ± 0.1 (0.033 ± 0.004)
Leader min.	390 (15.35)	390 (15.35)	390 (15.35)
Trailer min.	160 (6.30)	160 (6.30)	160 (6.30)
Reel Dimensions			
A max.	185 (7.28)	185 (7.28)	360 (14.17)
N min.	50 (1.97)	50 (1.97)	60 (2.36)
W_1	12.4 + 2.0/-0.0 (0.488 + 0.079/-0.0)	8.4 + 1.5/-0.0 (0.331 + 0.059/-0)	24.4 + 2.0/ -0.0 (0.961 + 0.079/-0)
W_2 max.	18.4 (0.724)	14.4 (0.567)	30.4 (1.20)