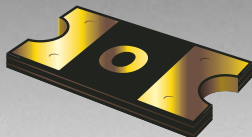


\*ROHS COMPLIANT



**BOURNS®**

## Features

- Compact design to save board space - 1206 footprint
- Small size results in very fast time to react to fault events
- Symmetrical design
- Low profile
- RoHS compliant\*
- Agency recognition:   

## Applications

- USB port protection - On the Go and 2.0
- PC motherboards - Plug and Play protection
- Mobile phones - Battery and port protection
- PDAs / Digital Cameras
- Game console port protection

## MF-NSMF Series - PTC Resettable Fuses

### Electrical Characteristics

Model	V max. Volts	I max. Amps	I <sub>hold</sub>	I <sub>trip</sub>	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 <sub>Min.</sub>	R <sub>1Max.</sub>			Typ.
MF-NSMF012	30.0	10	0.12	0.29	1.35	8.50	1.0	0.20	0.4
MF-NSMF020	24.0	10	0.20	0.46	0.60	2.60	1.0	0.60	0.6
MF-NSMF035	6.0	100	0.35	0.75	0.30	1.20	8.0	0.10	0.6
MF-NSMF050	13.2	100	0.50	1.00	0.15	0.70	8.0	0.10	0.4
MF-NSMF075	6.0	100	0.75	1.50	0.10	0.40	8.0	0.10	0.4
MF-NSMF110	6.0	100	1.10	2.20	0.06	0.20	8.0	0.10	0.6
MF-NSMF150	6.0	100	1.50	3.00	0.03	0.13	8.0	0.30	0.6
MF-NSMF200	6.0	100	2.00	4.00	0.02	0.085	8.0	1.00	0.7

### Environmental Characteristics

Operating 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-NSMF Series

Test	Test Conditions	Accept/Reject Criteria
Visual/Mech.....	Verify dimensions and materials .....	Per MF physical description
Resistance .....	In still air @ 23 °C.....	R <sub>min</sub> ≤ R ≤ R <sub>1max</sub>
Time to Trip .....	At specified current, V <sub>max</sub> , 23 °C .....	T ≤ max. time to trip (seconds)
Hold Current .....	30 min. at I <sub>hold</sub> .....	No trip
Trip Cycle Life .....	V <sub>max</sub> , I <sub>max</sub> , 100 cycles.....	No arcing or burning
Trip Endurance .....	V <sub>max</sub> , 48 hours .....	No arcing or burning
Solderability .....	ANSI/J-STD-002 .....	95 % min. coverage

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

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

Model	Ambient Operating Temperature								
	-40 °C	-20 °C	0 °C	23 °C	40 °C	50 °C	60 °C	70 °C	85 °C
MF-NSMF012	0.19	0.17	0.15	0.12	0.11	0.10	0.09	0.08	0.07
MF-NSMF020	0.30	0.27	0.24	0.20	0.18	0.16	0.14	0.12	0.11
MF-NSMF035	0.51	0.46	0.40	0.35	0.30	0.27	0.24	0.22	0.18
MF-NSMF050	0.76	0.68	0.59	0.50	0.44	0.40	0.35	0.32	0.26
MF-NSMF075	1.11	1.00	0.85	0.75	0.67	0.61	0.52	0.50	0.42
MF-NSMF110	1.64	1.46	1.30	1.10	0.92	0.83	0.80	0.65	0.52
MF-NSMF150	2.20	1.99	1.77	1.50	1.34	1.23	1.10	1.01	0.84
MF-NSMF200	2.88	2.61	2.28	2.00	1.80	1.66	1.51	1.39	1.19

\*RoHS Directive 2002/95/EC Jan 27 2003 including Annex  
 Specifications are subject to change without notice.  
 Customers should verify actual device performance in their specific applications.

## Additional Features

- Patents pending

## Additional Applications

- Automotive electronic control modules

# MF-NSMF Series - PTC Resettable Fuses

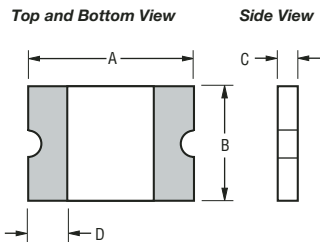
**BOURNS®**

### Product Dimensions

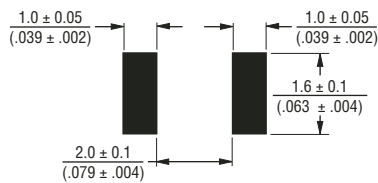
Model	A		B		C		D
	Min.	Max.	Min.	Max.	Min.	Max.	Min.
MF-NSMF012	$\frac{3.00}{(0.118)}$	$\frac{3.40}{(0.134)}$	$\frac{1.40}{(0.055)}$	$\frac{1.80}{(0.071)}$	$\frac{0.70}{(0.028)}$	$\frac{1.10}{(0.043)}$	$\frac{0.25}{(0.010)}$
MF-NSMF020	$\frac{3.00}{(0.118)}$	$\frac{3.40}{(0.134)}$	$\frac{1.40}{(0.055)}$	$\frac{1.80}{(0.071)}$	$\frac{0.48}{(0.019)}$	$\frac{0.85}{(0.033)}$	$\frac{0.25}{(0.010)}$
MF-NSMF035	$\frac{3.00}{(0.118)}$	$\frac{3.40}{(0.134)}$	$\frac{1.40}{(0.055)}$	$\frac{1.80}{(0.071)}$	$\frac{0.48}{(0.019)}$	$\frac{0.85}{(0.033)}$	$\frac{0.25}{(0.010)}$
MF-NSMF050	$\frac{3.00}{(0.118)}$	$\frac{3.40}{(0.134)}$	$\frac{1.40}{(0.055)}$	$\frac{1.80}{(0.071)}$	$\frac{0.48}{(0.019)}$	$\frac{0.85}{(0.033)}$	$\frac{0.25}{(0.010)}$
MF-NSMF075	$\frac{3.00}{(0.118)}$	$\frac{3.40}{(0.134)}$	$\frac{1.40}{(0.055)}$	$\frac{1.80}{(0.071)}$	$\frac{0.40}{(0.016)}$	$\frac{0.70}{(0.028)}$	$\frac{0.25}{(0.010)}$
MF-NSMF110	$\frac{3.00}{(0.118)}$	$\frac{3.40}{(0.134)}$	$\frac{1.40}{(0.055)}$	$\frac{1.80}{(0.071)}$	$\frac{0.40}{(0.016)}$	$\frac{0.70}{(0.028)}$	$\frac{0.25}{(0.010)}$
MF-NSMF150	$\frac{3.00}{(0.118)}$	$\frac{3.40}{(0.134)}$	$\frac{1.40}{(0.055)}$	$\frac{1.80}{(0.071)}$	$\frac{0.40}{(0.016)}$	$\frac{0.70}{(0.028)}$	$\frac{0.25}{(0.010)}$
MF-NSMF200	$\frac{3.00}{(0.118)}$	$\frac{3.50}{(0.138)}$	$\frac{1.40}{(0.055)}$	$\frac{1.80}{(0.071)}$	$\frac{0.70}{(0.028)}$	$\frac{1.60}{(0.063)}$	$\frac{0.25}{(0.010)}$

Packaging: 3000 pcs. per reel.

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



### Recommended Pad Layout



### Terminal material:

Electroless Ni under immersion Au

### Termination pad solderability:

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

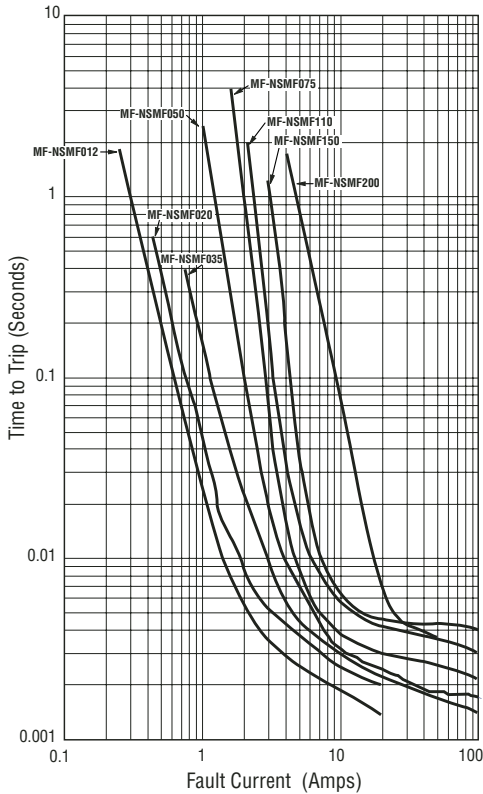
### Recommended Storage:

40 °C max./70 % RH max.

# MF-NSMF Series - PTC Resettable Fuses

**BOURNS®**

## 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

Multifuse® Product Designator **MF - NSMF 075 - 2**

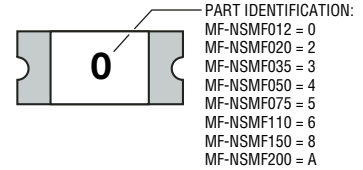
Series \_\_\_\_\_  
 NSMF = 1206 Surface Mount Component

Hold Current,  $I_{hold}$  \_\_\_\_\_  
 012-200 (0.12 Amps - 2.00 Amps)

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

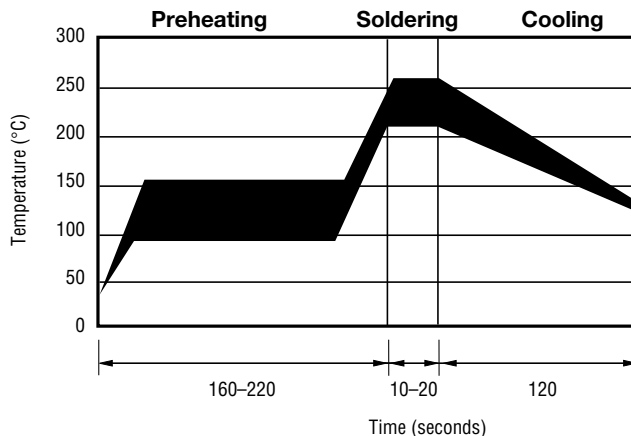
## Typical Part Marking

Represents total content. Layout may vary.



BIWEEKLY DATE CODE WILL APPEAR ON THE PACKAGING LABEL:  
 WEEK 1 AND 2 = A  
 WEEK 51 AND 52 = Z

## Solder Reflow Recommendations



### Notes:

- MF-NSMF models cannot be wave soldered. Please contact Bourns for hand soldering recommendations.
- If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.
- Compatible with Pb and Pb-free solder reflow profiles.



Circuit Protection Division

### Asia-Pacific:

Tel: +886-2 2562-4117 • Fax: +886-2 2562-4116

### Europe:

Tel: +41-41 768 5555 • Fax: +41-41 768 5510

### The Americas:

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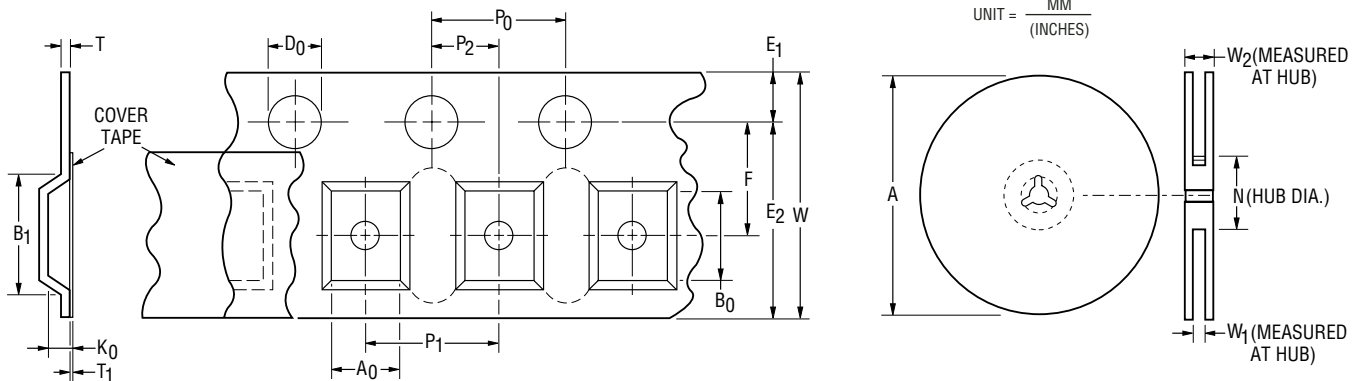
[www.bourns.com](http://www.bourns.com)

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# MF-NSMF Series Tape and Reel Specifications



Tape Dimensions	MF-NSMF012 & MF-NSMF200 per EIA 481-1	MF-NSMF020 ~ MF-NSMF050 per EIA 481-1	MF-NSMF075 ~ MF-NSMF150 per EIA 481-1
W	$\frac{8.0 \pm 0.30}{(0.315 \pm 0.012)}$	$\frac{8.0 \pm 0.30}{(0.315 \pm 0.012)}$	$\frac{8.0 \pm 0.30}{(0.315 \pm 0.012)}$
P <sub>0</sub>	$\frac{4.0 \pm 0.10}{(0.157 \pm 0.004)}$	$\frac{4.0 \pm 0.10}{(0.157 \pm 0.004)}$	$\frac{4.0 \pm 0.10}{(0.157 \pm 0.004)}$
P <sub>1</sub>	$\frac{4.0 \pm 0.10}{(0.157 \pm 0.004)}$	$\frac{4.0 \pm 0.10}{(0.157 \pm 0.004)}$	$\frac{4.0 \pm 0.10}{(0.157 \pm 0.004)}$
P <sub>2</sub>	$\frac{2.0 \pm 0.05}{(0.079 \pm 0.002)}$	$\frac{2.0 \pm 0.05}{(0.079 \pm 0.002)}$	$\frac{2.0 \pm 0.05}{(0.079 \pm 0.002)}$
A <sub>0</sub>	$\frac{1.90 \pm 0.10}{(0.075 \pm 0.004)}$	$\frac{1.90 \pm 0.10}{(0.075 \pm 0.004)}$	$\frac{1.90 \pm 0.10}{(0.075 \pm 0.004)}$
B <sub>0</sub>	$\frac{3.50 \pm 0.10}{(0.138 \pm 0.004)}$	$\frac{3.45 \pm 0.10}{(0.136 \pm 0.004)}$	$\frac{3.45 \pm 0.10}{(0.136 \pm 0.004)}$
B <sub>1</sub> max.	$\frac{4.35}{(0.171)}$	$\frac{4.35}{(0.171)}$	$\frac{4.35}{(0.171)}$
D <sub>0</sub>	$\frac{1.50 + 0.1/-0.0}{(0.059 + 0.004/-0)}$	$\frac{1.50 + 0.1/-0.0}{(0.059 + 0.004/-0)}$	$\frac{1.50 + 0.1/-0.0}{(0.059 + 0.004/-0)}$
F	$\frac{3.5 \pm 0.05}{(0.138 \pm 0.002)}$	$\frac{3.5 \pm 0.05}{(0.138 \pm 0.002)}$	$\frac{3.5 \pm 0.05}{(0.138 \pm 0.002)}$
E <sub>1</sub>	$\frac{1.75 \pm 0.10}{(0.069 \pm 0.004)}$	$\frac{1.75 \pm 0.10}{(0.069 \pm 0.004)}$	$\frac{1.75 \pm 0.10}{(0.069 \pm 0.004)}$
E <sub>2</sub> min.	$\frac{6.25}{(0.246)}$	$\frac{6.25}{(0.246)}$	$\frac{6.25}{(0.246)}$
T max.	$\frac{0.6}{(0.024)}$	$\frac{0.6}{(0.024)}$	$\frac{0.6}{(0.024)}$
T <sub>1</sub> max.	$\frac{0.1}{(0.004)}$	$\frac{0.1}{(0.004)}$	$\frac{0.1}{(0.004)}$
K <sub>0</sub>	$\frac{1.35 \pm 0.10}{(0.053 \pm 0.004)}$	$\frac{1.04 \pm 0.10}{(0.041 \pm 0.004)}$	$\frac{0.85 \pm 0.10}{(0.033 \pm 0.004)}$
Leader min.	$\frac{390}{(15.35)}$	$\frac{390}{(15.35)}$	$\frac{390}{(15.35)}$
Trailer min.	$\frac{160}{(6.30)}$	$\frac{160}{(6.30)}$	$\frac{160}{(6.30)}$
<b>Reel Dimensions</b>			
A max.	$\frac{185}{(7.28)}$	$\frac{185}{(7.28)}$	$\frac{185}{(7.28)}$
N min.	$\frac{50}{(1.97)}$	$\frac{50}{(1.97)}$	$\frac{50}{(1.97)}$
W <sub>1</sub>	$\frac{8.4 + 1.5/-0.0}{(0.331 + 0.059/-0.0)}$	$\frac{8.4 + 1.5/-0.0}{(0.331 + 0.059/-0.0)}$	$\frac{8.4 + 1.5/-0.0}{(0.331 + 0.059/-0.0)}$
W <sub>2</sub> max.	$\frac{14.4}{(0.567)}$	$\frac{14.4}{(0.567)}$	$\frac{14.4}{(0.567)}$



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