

Applications

- Thermal protection for Li-ion & polymer battery packs
- USB port protection - USB 2.0, 3.0 & OTG
- HDMI 1.4 Source protection
- PC motherboards - Plug & Play protection
- Mobile phones - Battery & port protection
- PDAs / digital cameras
- Game console port protection

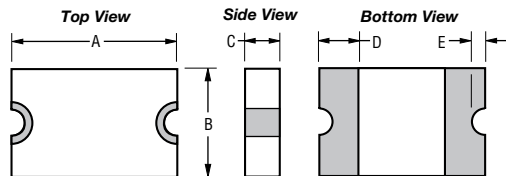
MF-NSML Series - Low Ohmic PTC Resettable Fuses

BOURNS®

Product Dimensions

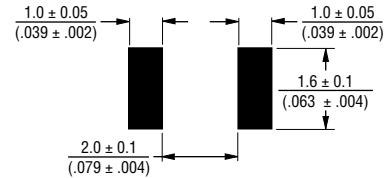
Model	A		B		C		D	E	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Min.	Max.
MF-NSML150	$\frac{3.00}{(0.118)}$	$\frac{3.50}{(0.138)}$	$\frac{1.40}{(0.055)}$	$\frac{1.80}{(0.071)}$	$\frac{0.30}{(0.012)}$	$\frac{0.60}{(0.024)}$	$\frac{0.25}{(0.010)}$	$\frac{0.05}{(0.002)}$	$\frac{0.45}{(0.018)}$
MF-NSML175									
MF-NSML190									
MF-NSML200									
MF-NSML260									
MF-NSML300									
MF-NSML350									
MF-NSML380									
MF-NSML400									
MF-NSML450									
MF-NSML500									
MF-NSML550									
MF-NSML600									

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



Terminal material:
ENIG-plated terminals

Recommended Pad Layout



Packaging Specifications

MF-NSML150~MF-NSML400 = 5000 pcs. per reel
 MF-NSML450~MF-NSML500 = 3500 pcs. per reel
 MF-NSML550~MF-NSML600 = 3000 pcs. per reel

Thermal Derating Table - 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-NSML150	2.20	2.00	1.77	1.50	1.28	1.15	1.07	0.85	0.70
MF-NSML175	2.57	2.33	2.07	1.75	1.49	1.34	1.24	1.00	0.80
MF-NSML190	2.80	2.55	2.25	1.90	1.60	1.46	1.35	1.09	0.90
MF-NSML200	2.94	2.65	2.35	2.00	1.70	1.53	1.42	1.14	0.93
MF-NSML260	3.82	3.46	3.07	2.60	2.21	1.95	1.85	1.48	1.20
MF-NSML300	4.41	3.99	3.54	3.00	2.55	2.32	2.13	1.71	1.38
MF-NSML350	5.15	4.66	4.13	3.50	2.98	2.71	2.49	2.00	1.65
MF-NSML380	5.59	5.05	4.48	3.80	3.23	2.95	2.60	2.15	1.75
MF-NSML400	5.80	5.25	4.65	4.00	3.40	3.10	2.65	2.20	1.80
MF-NSML450	6.10	5.40	4.70	4.50	3.60	3.15	2.70	2.25	1.85
MF-NSML500	6.80	6.00	5.25	5.00	4.00	3.50	3.00	2.50	1.90
MF-NSML550	7.50	6.60	5.80	5.50	4.40	3.85	3.30	2.75	2.10
MF-NSML600	8.15	7.20	6.35	6.00	4.80	4.20	3.60	3.00	2.30

Specifications are subject to change without notice.

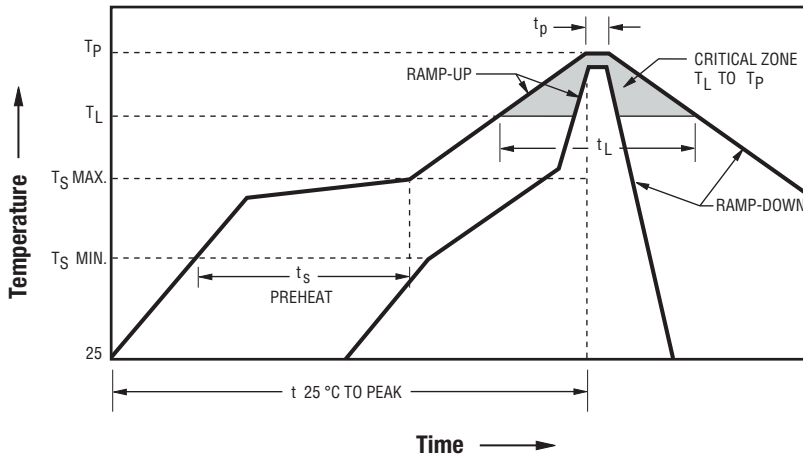
Users should verify actual device performance in their specific applications.

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MF-NSML Series - Low Ohmic PTC Resettable Fuses



Solder Reflow Recommendations



Notes:

- MF-NSML models cannot be wave soldered or hand soldered. Please contact Bourns for soldering recommendations.
- All temperatures refer to topside of the package, measured on the package body surface.
- If reflow temperatures exceed the recommended profile, devices may not meet the published specifications.
- 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.

Profile Feature	Pb-Free Assembly
Average Ramp-Up Rate ($T_{S_{max}}$ to T_P)	3 °C / second max.
PREHEAT: Temperature Min. ($T_{S_{min}}$) Temperature Max. ($T_{S_{max}}$) Time ($T_{S_{min}}$ to $T_{S_{max}}$) (t_s)	150 °C 200 °C 60~180 seconds
TIME MAINTAINED ABOVE: Temperature (T_L) Time (t_L)	217 °C 60~150 seconds
Peak Temperature (T_P)	260 °C
Time within 5 °C of Actual Peak Temperature (t_p)	20~40 seconds
Ramp-Down Rate	6 °C / second max.
Time 25 °C to Peak Temperature	8 minutes max.

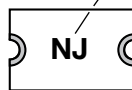
How to Order

MF - NSML 200 - 2

Multifuse® Product Designator _____
 Series _____
 NSML = 1206 Low Ohmic Surface Mount Component
 Hold Current, Ihold _____
 150 - 600 (1.50 Amps - 6.00 Amps)
 Packaging _____
 Packaged per EIA 481
 -2 = Tape and Reel

Typical Part Marking

Represents total content. Layout may vary.



PART IDENTIFICATION:

MF-NSML150 = NG
 MF-NSML175 = NH
 MF-NSML190 = NI
 MF-NSML200 = NJ
 MF-NSML260 = NN
 MF-NSML300 = NP
 MF-NSML350 = NS
 MF-NSML380 = NV
 MF-NSML400 = NU
 MF-NSML450 = NX
 MF-NSML500 = NY
 MF-NSML550 = N5
 MF-NSML600 = NZ

MANUFACTURING DATE CODE IS LOCATED ON PACKING LABEL.



Asia-Pacific:

Tel: +886-2 2562-4117
 Email: asiacus@bourns.com

Europe:

Tel: +36 88 885 877
 Email: eurocus@bourns.com

The Americas:

Tel: +1-951 781-5500
 Email: americus@bourns.com
www.bourns.com

MF-NSML SERIES, REV. L, 03/21

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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

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