Features

- Compliant with AEC-Q200 Rev-C Stress Test Qualification for Passive Components in Automotive Applications
- Operating temperature range up to 125 °C
- Low thermal derating factor
- Higher hold currents at elevated temperature
- Choice of operating currents
- RoHS compliant*

MF-SMHT 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-SMHT136	16	100	1.36	2.72	0.085	0.33	8.0	10.0	2.1
MF-SMHT160	16	100	1.60	3.20	0.050	0.15	8.0	10.0	2.1

Environmental Characteristics

Operating Temperature	-40 °C to +125 °C	
Storage Temperature	-40 °C to +85 °C	
Passive Aging	+125 °C, 1000 hours	±15 % typical resistance change
Humidity Aging	+85 °C, 85 % R.H. 1000 hours	±15 % typical resistance change
Thermal Shock	MIL-STD-202F, Method 107G, +125 °C to -40 °C, 10 cycles	±15 % typical resistance 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-SMHT 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

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	125 °C
MF-SMHT136	1.91 / 3.82	1.72 / 3.44	1.54 / 3.08	1.36 / 2.72	1.18 / 2.36	1.09 / 2.18	1.00 / 2.00	0.91 / 1.82	0.77 / 1.54	0.40 / 0.80
MF-SMHT160	2.15 / 4.30	1.96 / 3.92	1.78 / 3.56	1.60 / 3.20	1.42 / 2.48	1.33 / 2.66	1.24 / 2.48	1.15 / 3.30	1.02 / 2.04	0.64 / 1.28

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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.

Applications

- Protection of automotive circuitry including engine control modules
- Overcurrent surge protection of electronic equipment required to operate at high operating temperature ranges
- Resettable fault protection of general electronic equipment

MF-SMHT Series - PTC Resettable Fuses

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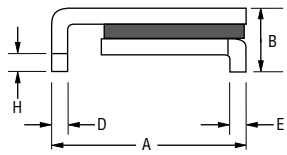
Product Dimensions

Model	A		B	C	D		E		F		G		H
	Min.	Max.	Max.	Max.	Min.	Max.	Min.	Max	Min.	Max.	Min.	Max.	Min.
MF-SMHT136	6.73 (0.265)	7.98 (0.314)	3.00 (0.118)	5.44 (0.214)	0.56 (0.022)	0.71 (0.028)	0.56 (0.022)	0.71 (0.028)	2.16 (0.085)	2.41 (0.095)	0.66 (0.026)	1.37 (0.054)	0.43 (0.017)
MF-SMHT160	8.00 (0.315)	9.50 (0.374)	3.00 (0.118)	6.71 (0.264)	0.56 (0.022)	0.71 (0.028)	0.56 (0.022)	0.71 (0.028)	3.68 (0.145)	3.94 (0.155)	0.66 (0.026)	1.37 (0.054)	0.43 (0.017)

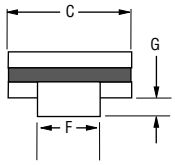
Packaging:
TAPE & REEL: MF-SMHT136 = 2000 pcs. per reel; MF-SMHT160 = 1500 pcs. per reel.

DIMENSIONS: MM / (INCHES)



Side View

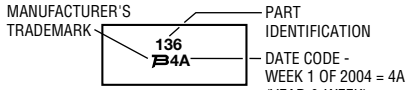
Terminal material:
Tin-plated brass



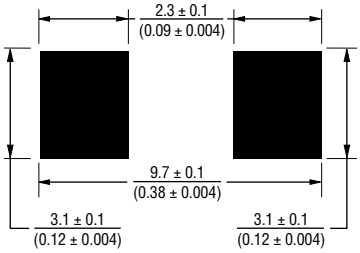
End View

Typical Part Marking

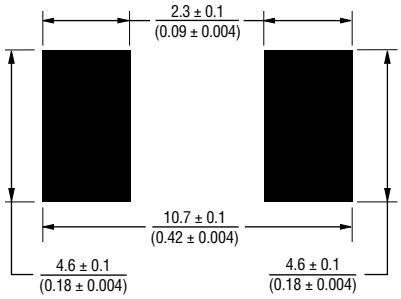
Represents total content. Layout may vary.



Recommended Pad Layout
MF-SMHT136



Recommended Pad Layout
MF-SMHT160



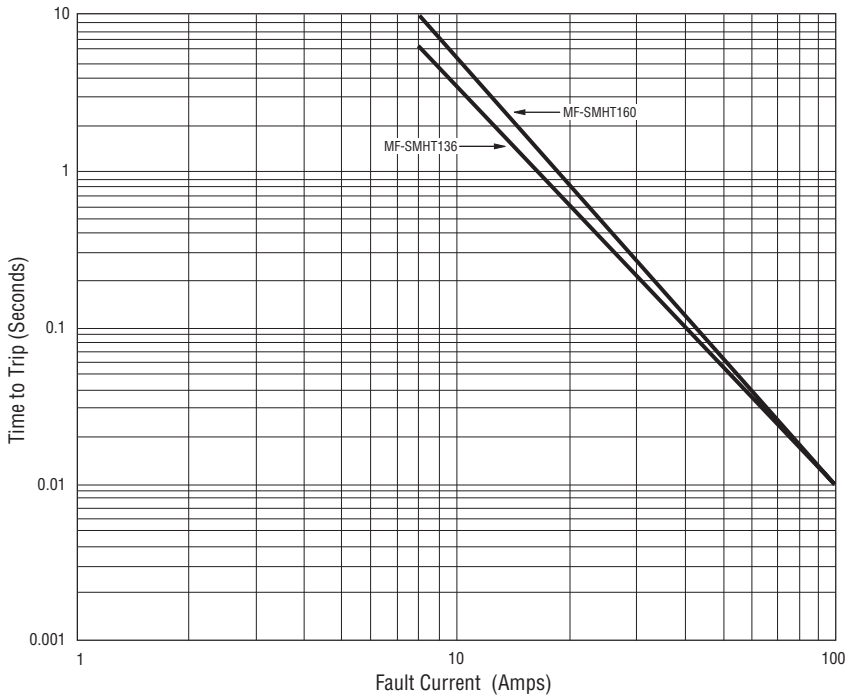
How to Order

MF - SMHT 136 - 2

Multifuse® Product Designator
Series
SMHT = Surface Mount Component
Hold Current, Ihold
136 - 160 (1.36 - 1.60 Amps)
Packaging Options
- 2 = Tape and Reel*

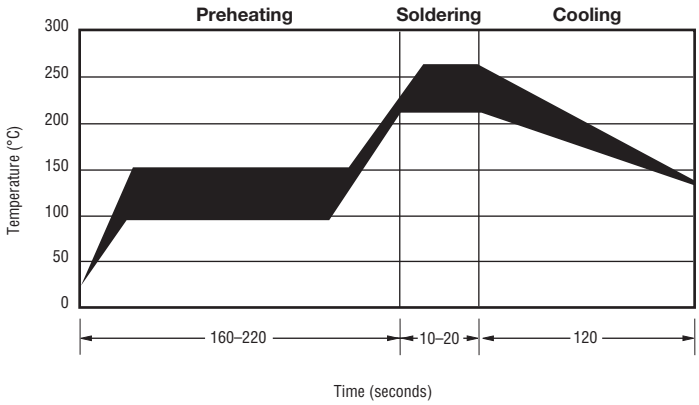
*Packaged per EIA-481-2

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.

Solder Reflow Recommendations



Solder reflow

- Recommended reflow methods: IR, vapor phase oven, hot air oven.
- Devices are not designed to be wave soldered to the bottom side of the board.
- Gluing the devices is not recommended.
- Recommended maximum paste thickness is 0.25 mm (.010 inch).
- Devices can be cleaned using standard industry methods and solvents.

Note:

- If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.

Rework

- A device should not be reworked.

MF-SMHT Series Tape and Reel Specifications

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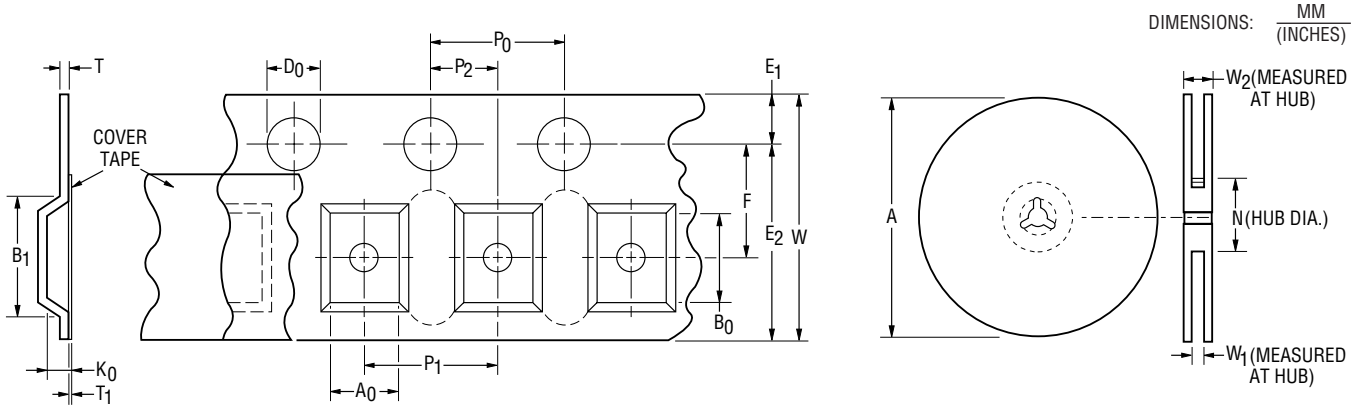
NOTE: Effective December 1, 2010 (product date code V0), the cover tape will be changed to the new 3M™ Universal Cover Tape (UCT).

Tape Dimensions	MF-SMHT136 per EIA-481-2	MF-SMHT160 per EIA 481-2
W	16.3 (0.642)	16.3 (0.642)
P_0	4.0 ± 0.1 (0.157 ± 0.004)	4.0 ± 0.1 (0.157 ± 0.004)
P_1	8.0 ± 0.1 (0.315 ± 0.004)	12.0 ± 0.1 (0.472 ± 0.004)
P_2	2.0 ± 0.1 (0.079 ± 0.004)	2.0 ± 0.1 (0.079 ± 0.004)
A_0	5.7 ± 0.1 (0.224 ± 0.004)	6.9 ± 0.1 (0.272 ± 0.004)
B_0	8.1 ± 0.1 (0.319 ± 0.004)	9.6 ± 0.1 (0.378 ± 0.004)
B_1 max.	12.1 (0.476)	12.1 (0.476)
D_0	1.5 + 0.1/-0.0 (0.059 + 0.004/-0)	1.5 + 0.1/-0.0 (0.059 + 0.004/-0)
F	7.5 ± 0.1 (0.295 + 0.004)	7.5 ± 0.1 (0.295 + 0.004)
E_1	1.75 ± 0.1 (0.069 ± 0.004)	1.75 ± 0.1 (0.069 ± 0.004)
E_2 min.	14.25 (0.561)	14.25 (0.561)
T max.	0.6 (0.024)	0.6 (0.024)
T_1 max.	0.1 (0.004)	0.1 (0.004)
K_0	3.4 ± 0.1 (0.134 ± 0.004)	3.4 ± 0.1 (0.134 ± 0.004)
Leader min.	390 (15.35)	390 (15.35)
Trailer min.	160 (6.30)	160 (6.30)
Reel Dimensions		
A max.	360 (14.17)	360 (14.17)
N min.	50 (1.97)	50 (1.97)
W_1	16.4 + 2.0/ -0.0 (0.646 + 0.079/-0)	16.4 + 2.0/ -0.0 (0.646 + 0.079/-0)
W_2 max.	22.4 (0.882)	22.4 (0.882)



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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