

Multifuse® Shortform Catalog 2003



Reliable Electronic Solutions

Multifuse® Products

Bourns® Multifuse® family of Polymer Positive Temperature Coefficient (PPTC) “resettable fuses” are used in a wide variety of circuit protection applications.

Under fault conditions the device resistance will rise exponentially and remain in a “tripped” state, providing continuous circuit protection until the fault is removed. Once the fault is removed and the power cycled the device will return to its normal low resistance state.

Features/Benefits

- Resettable circuit protection
- Agency approval - UL, CSA, TÜV
- Popular footprints and packaging options
- Low resistance
- Lead free options
- Custom designs available

Applications

- Computer
- Battery
- Automotive
- Telecommunications
- Industrial
- Consumer

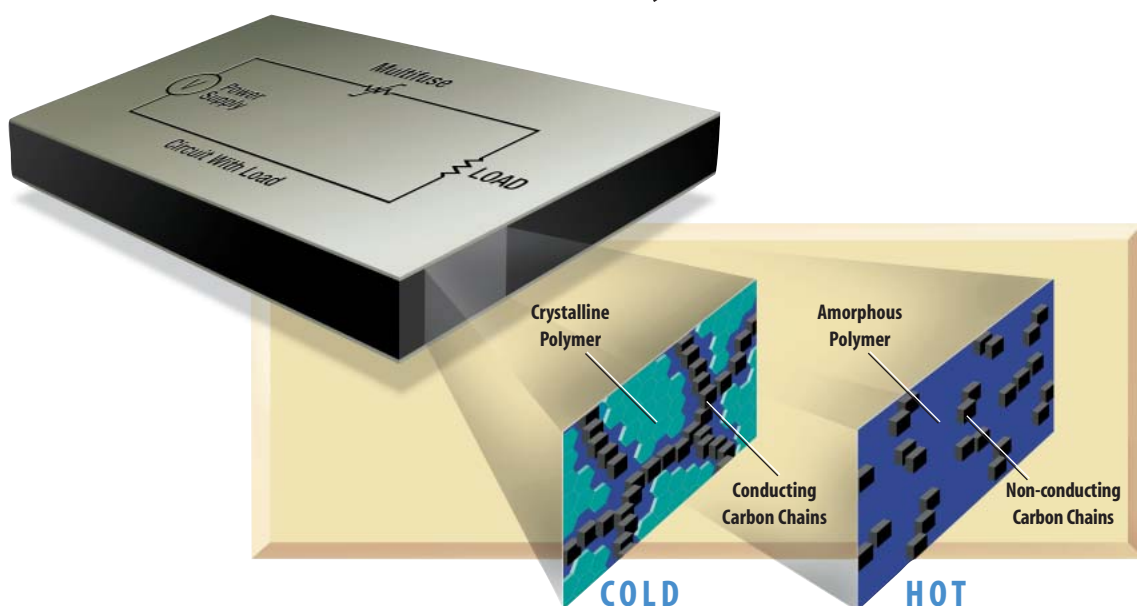
What's New in this Edition

- Telecom Rated Products
 - MF-R/90
 - MF-R/250
 - MF-R/600

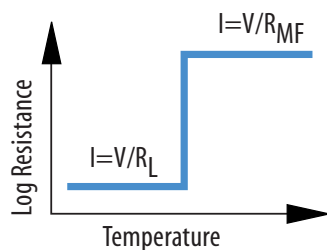
What's Next

- Full line of SMD lead-free products
 - MF-MSMF - Available 3rd Quarter 2003

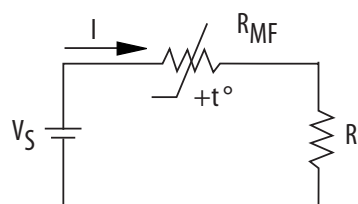
Multifuse® Products - How They Work



Multifuse® Products - How They're Used



PTC Response Characteristic



Typical Circuit Application

Definitions

Agency Approvals

Bourns® PTCs are certified under UL, CSA, IEC and TÜV registration programs.

Current, Hold (I_{hold})

The maximum current a PTC device can pass without interruption.

Current, Maximum (I_{max})

The maximum fault current a PTC device can withstand without damage at the rated voltage.

Current, Trip (I_{trip})

The minimum current that will switch a PTC from the low resistance to the high resistance state.

Fault Current

The peak current that flows through a PTC or wire during a short circuit or arc back.

Positive Temperature Coefficient (PTC)

A characteristic of the PTC device that describes the large increase in resistance as the device reaches its switching (trip) temperature.

Resistance, Post Trip (R_{1max})

The maximum resistance one hour after a PTC device has been tripped and power has been removed.

Resistance, Post Reflow (R_{1max})

The maximum resistance one hour after a PTC surface mount device has been reflow soldered.

Voltage, Maximum (V_{max})

The maximum voltage a PTC device can withstand without damage at the rated current.

Agency File Numbers

 UL File NumberE 174545S

 CSA File NumberCA 110338

 TÜV File NumberR2057213

Product Selection Worksheet

1. What is the normal circuit operating current (I_{hold})_____
2. What is the maximum circuit voltage (V_{max})_____
3. What is the maximum fault current (I_{max})_____
4. What is the preferred form factor_____

Note: Other factors including thermal derating and time to trip characteristics may be important application considerations. Please refer to the full Bourns® data sheet of each product at www.bourns.com.

How To Order

MF - R 012/250 U - A 05 - 2

Multifuse® Product Designator _____

Series _____

- R = Radial Leaded
- RX = Radial Leaded
- SM = Surface Mount
- MSMD = Surface Mount
- ESMD = Surface Mount
- USMD = Surface Mount
- S = Axial Leaded Strap
- LR = Axial Leaded Strap
- LS = Axial Leaded Strap
- SVS = Axial Leaded Strap
- VSN = Axial Leaded Strap
- VS = Axial Leaded Strap

Hold Current, I_{hold} _____

Voltage Options:

Max. Interrupt Voltage, V _____

Construction Options: _____

- N = Narrow Device Option (3.6 mm)*
- S = Slotted Lead Option (one side)*
- SS = Slotted Lead Option (two sides)*
- L = Longer Lead Option*
- U = Uncoated
- T = Pretripped **

Resistance Sorted** _____

(see individual data sheets)

Resistance Bins of 0.5 Ω ** _____

05 = 0.5 Ω

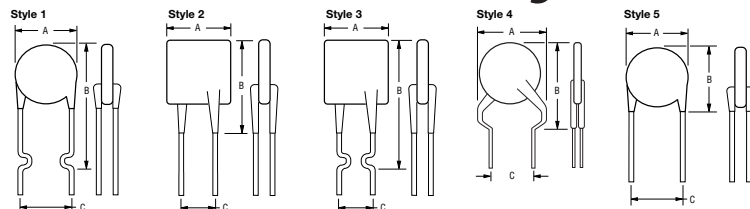
Packaging Options _____

- 0 = Bulk Packaging
- 2 = Tape and Reel
- AP = Ammo-Pak

*Axial Leaded Strap products only.

**Telecom Radial Leaded products only.

Radial Leaded Low Voltage Products



Features

- Bulk and Tape and Reel Packaging
- Industry Standard Sizes

Applications

- Computers and Peripherals
- General Electronics
- Automotive
- Consumer Appliances
- Electronic Toys

MF-R Series Radial Leaded

16-60 Volts
0.05-11 Amps Hold Current

Model	I _{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance	1 Hour (R _T) Post-Trip Resistance	Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Nom.	
				Min.	Max.				
MF-R005	0.05	60	40	7.3	22.0	8.0 (0.315)	8.3 (0.327)	5.1 (0.201)	4
MF-R010	0.10	60	40	2.50	7.50	7.4 (0.291)	12.7 (0.500)	5.1 (0.201)	1
MF-R017	0.17	60	40	2.00	8.00	7.4 (0.291)	12.7 (0.500)	5.1 (0.201)	1
MF-R020	0.20	60	40	1.50	4.40	7.4 (0.291)	12.7 (0.500)	5.1 (0.201)	1
MF-R025	0.25	60	40	1.00	3.00	7.4 (0.291)	12.7 (0.500)	5.1 (0.201)	1
MF-R030	0.30	60	40	0.76	2.10	7.4 (0.291)	13.4 (0.528)	5.1 (0.201)	1
MF-R040	0.40	60	40	0.52	1.29	7.4 (0.291)	13.7 (0.539)	5.1 (0.201)	1
MF-R050	0.50	60	40	0.41	1.17	7.9 (0.311)	13.7 (0.539)	5.1 (0.201)	1
MF-R065	0.65	60	40	0.27	0.72	9.7 (0.382)	15.2 (0.598)	5.1 (0.201)	1
MF-R075	0.75	60	40	0.18	0.60	10.4 (0.409)	16.0 (0.630)	5.1 (0.201)	1
MF-R090	0.90	60	40	0.14	0.47	11.7 (0.461)	16.7 (0.657)	5.1 (0.201)	1
MF-R090-0-9	0.90	30	40	0.07	0.22	7.4 (0.291)	12.2 (0.480)	5.1 (0.201)	3
MF-R110	1.10	30	40	0.10	0.27	8.9 (0.350)	14.0 (0.551)	5.1 (0.201)	1
MF-R135	1.35	30	40	0.065	0.17	8.9 (0.350)	18.9 (0.744)	5.1 (0.201)	1
MF-R160	1.60	30	40	0.055	0.15	10.2 (0.402)	16.8 (0.661)	5.1 (0.201)	1
MF-R185	1.85	30	40	0.040	0.11	12.0 (0.472)	18.4 (0.724)	5.1 (0.201)	1
MF-R250	2.50	30	40	0.025	0.07	12.0 (0.472)	18.3 (0.720)	5.1 (0.201)	2
MF-R250-0-10	2.50	30	40	0.025	0.07	11.4 (0.449)	18.3 (0.720)	5.1 (0.201)	3
MF-R300	3.00	30	40	0.020	0.08	12.0 (0.472)	18.3 (0.720)	5.1 (0.201)	2
MF-R400	4.00	30	40	0.010	0.05	14.4 (0.567)	24.8 (0.976)	5.1 (0.201)	2
MF-R500	5.00	30	40	0.010	0.05	17.4 (0.685)	24.9 (0.980)	10.2 (0.402)	2
MF-R600	6.00	30	40	0.005	0.04	19.3 (0.760)	31.9 (1.256)	10.2 (0.402)	2
MF-R700	7.00	30	40	0.005	0.03	22.1 (0.870)	29.8 (1.173)	10.2 (0.402)	2
MF-R800	8.00	30	40	0.005	0.03	24.2 (0.953)	32.9 (1.295)	10.2 (0.402)	2
MF-R900	9.00	30	40	0.005	0.02	24.2 (0.953)	32.9 (1.295)	10.2 (0.402)	2
MF-R1100	11.00	16	100	0.003	0.014	24.2 (0.953)	32.9 (1.295)	10.2 (0.402)	2

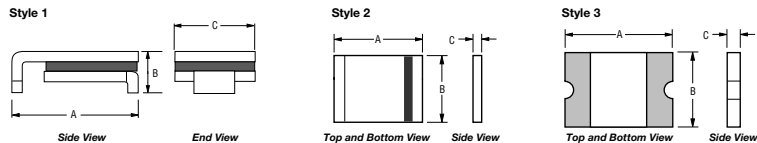
MF-RX Series Radial Leaded

60 Volts
1.10-3.75 Amps Hold Current

Model	I ^{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance	1 Hour (R ₁) Post-Trip Resistance	Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Nom.	
				Min.	Max.				
MF-RX110	1.10	60	40	0.15	0.38	13.0 (0.512)	18.0 (0.709)	5.1 (0.201)	5
MF-RX135	1.35	60	40	0.12	0.30	14.5 (0.571)	19.6 (0.772)	5.1 (0.201)	5
MF-RX160	1.60	60	40	0.09	0.22	16.3 (0.642)	21.3 (0.839)	5.1 (0.201)	5
MF-RX185	1.85	60	40	0.08	0.19	17.8 (0.701)	22.9 (0.902)	5.1 (0.201)	5
MF-RX250	2.50	60	40	0.05	0.13	21.3 (0.839)	26.4 (1.039)	10.2 (0.402)	5
MF-RX300	3.00	60	40	0.04	0.10	24.9 (0.980)	30.0 (1.181)	10.2 (0.402)	5
MF-RX375	3.75	60	40	0.03	0.08	28.4 (1.118)	33.5 (1.319)	10.2 (0.402)	5

MF-R and MF-RX Series are available lead-free on request. Contact your nearest Bourns representative.

Surface Mount Low Voltage Products



Features

- Tape and Reel Packaging
- Industry Standard Sizes

Applications

- Computers and Peripherals
- General Electronics
- Automotive

MF-SM Series (2920 package) 6-60 Volts Surface Mount 0.30-2.60 Amps Hold Current

Model	I _{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance	1 Hour (R ₁) Post-Trip Resistance	Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Max.	
				Min.	Max.				
MF-SM030	0.30	60	40	0.90	4.80	<u>7.98</u> (0.314)	<u>3.18</u> (0.125)	<u>5.44</u> (0.214)	1
MF-SM050	0.50	60	40	0.35	1.40	<u>7.98</u> (0.314)	<u>3.18</u> (0.125)	<u>5.44</u> (0.214)	1
MF-SM075	0.75	30	80	0.23	1.00	<u>7.98</u> (0.314)	<u>3.18</u> (0.125)	<u>5.44</u> (0.214)	1
MF-SM100	1.10	30	80	0.12	0.48	<u>7.98</u> (0.314)	<u>3.00</u> (0.118)	<u>5.44</u> (0.214)	1
MF-SM100/33	1.10	33	40	0.12	0.41	<u>7.98</u> (0.314)	<u>3.00</u> (0.118)	<u>5.44</u> (0.214)	1
MF-SM125	1.25	15	100	0.07	0.25	<u>7.98</u> (0.314)	<u>3.00</u> (0.118)	<u>5.44</u> (0.214)	1
MF-SM260	2.60	6	100	0.025	0.075	<u>7.98</u> (0.314)	<u>3.00</u> (0.118)	<u>5.44</u> (0.214)	1

MF-SM Series (3425 package) 15-33 Volts Surface Mount 1.50-2.50 Amps Hold Current

Model	I _{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance	1 Hour (R ₁) Post-Trip Resistance	Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Max.	
				Min.	Max.				
MF-SM150	1.50	15	100	0.06	0.25	9.50 (0.374)	3.00 (0.118)	6.71 (0.264)	1
MF-SM150/33	1.50	33	40	0.06	0.23	9.50 (0.374)	3.00 (0.118)	6.71 (0.264)	1
MF-SM185/33	1.80	33	40	0.04	0.15	9.50 (0.374)	3.00 (0.118)	6.71 (0.264)	1
MF-SM200	2.00	15	100	0.045	0.125	9.50 (0.374)	3.00 (0.118)	6.71 (0.264)	1
MF-SM250	2.50	15	100	0.024	0.085	9.50 (0.374)	3.00 (0.118)	6.71 (0.264)	1

MF-MSMD Series (1812 package) 6-60 Volts Surface Mount 0.10-2.60 Amps Hold Current

Model	I ^h _{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance	1 Hour (R ₁) Post-Trip Resistance	Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Max.	
				Min.	Max.				
MF-MSMD010	0.10	60.0	40	0.70	15.00	$\frac{4.73}{(0.186)}$	$\frac{3.41}{(0.134)}$	$\frac{0.81}{(0.032)}$	2
MF-MSMD014	0.14	60.0	40	0.40	6.50	$\frac{4.73}{(0.186)}$	$\frac{3.41}{(0.134)}$	$\frac{0.81}{(0.032)}$	2
MF-MSMD020	0.20	30.0	80	0.40	6.00	$\frac{4.73}{(0.186)}$	$\frac{3.41}{(0.134)}$	$\frac{0.81}{(0.032)}$	2
MF-MSMD030	0.30	30.0	10	0.30	3.00	$\frac{4.73}{(0.186)}$	$\frac{3.41}{(0.134)}$	$\frac{0.81}{(0.032)}$	2
MF-MSMD050	0.50	15.0	100	0.15	1.00	$\frac{4.73}{(0.186)}$	$\frac{3.41}{(0.134)}$	$\frac{0.62}{(0.024)}$	2
MF-MSMD075	0.75	13.2	100	0.11	0.45	$\frac{4.73}{(0.186)}$	$\frac{3.41}{(0.134)}$	$\frac{0.62}{(0.024)}$	2
MF-MSMD075/24*	0.75	24.0	40	0.11	0.45	$\frac{4.73}{(0.186)}$	$\frac{3.41}{(0.134)}$	$\frac{0.62}{(0.024)}$	2
MF-MSMD110	1.10	6.0	100	0.04	0.21	$\frac{4.73}{(0.186)}$	$\frac{3.41}{(0.134)}$	$\frac{0.62}{(0.024)}$	2
MF-MSMD110/16	1.10	16.0	100	0.04	0.21	$\frac{4.73}{(0.186)}$	$\frac{3.41}{(0.134)}$	$\frac{0.62}{(0.024)}$	2
MF-MSMD125	1.25	6.0	100	0.035	0.14	$\frac{4.73}{(0.186)}$	$\frac{3.41}{(0.134)}$	$\frac{0.48}{(0.019)}$	2
MF-MSMD150	1.50	6.0	100	0.03	0.120	$\frac{4.73}{(0.186)}$	$\frac{3.41}{(0.134)}$	$\frac{0.48}{(0.019)}$	2
MF-MSMD160	1.60	8.0	100	0.035	0.099	$\frac{4.73}{(0.186)}$	$\frac{3.41}{(0.134)}$	$\frac{0.48}{(0.019)}$	2
MF-MSMD200	2.00	6.0	100	0.020	0.100	$\frac{4.73}{(0.186)}$	$\frac{3.41}{(0.134)}$	$\frac{0.48}{(0.019)}$	2
MF-MSMD260	2.60	6.0	100	0.015	0.080	$\frac{4.73}{(0.186)}$	$\frac{3.41}{(0.134)}$	$\frac{0.48}{(0.019)}$	2

*UL pending

MF-USMD Series (1210 package) 6-30 Volts Surface Mount 0.05-1.10 Amps Hold Current

Model	I ^{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance	1 Hour (R ₁) Post-Trip Resistance	Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Max.	
				Min.	Max.				
MF-USMD005	0.05	30.0	10	2.80	50.0	<u>3.43</u> (0.135)	<u>2.80</u> (0.110)	<u>0.85</u> (0.033)	2
MF-USMD010	0.10	30.0	10	0.80	15.0	<u>3.43</u> (0.135)	<u>2.80</u> (0.110)	<u>0.85</u> (0.033)	2
MF-USMD020	0.20	30.0	10	0.40	5.00	<u>3.43</u> (0.135)	<u>2.80</u> (0.110)	<u>0.85</u> (0.033)	2
MF-USMD035	0.35	6.0	40	0.20	1.30	<u>3.43</u> (0.135)	<u>2.80</u> (0.110)	<u>0.62</u> (0.024)	2
MF-USMD050	0.50	13.2	40	0.18	0.90	<u>3.43</u> (0.135)	<u>2.80</u> (0.110)	<u>0.62</u> (0.024)	2
MF-USMD075	0.75	6.0	40	0.07	0.450	<u>3.43</u> (0.135)	<u>2.80</u> (0.110)	<u>0.62</u> (0.024)	2
MF-USMD110	1.10	6.0	40	0.05	0.210	<u>3.43</u> (0.135)	<u>2.80</u> (0.110)	<u>0.48</u> (0.019)	2

MF-ESMD Series (Low Resistance, Low Trip Temp.) 16 Volts Surface Mount 1.9 Amps Hold Current

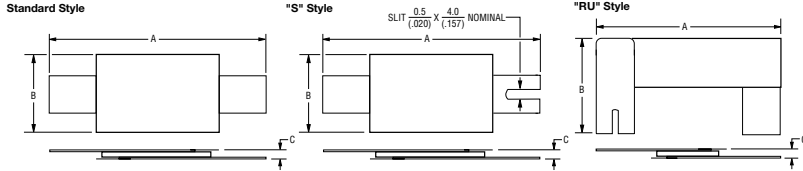
Model	I ^{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance	1 Hour (R ₁) Post-Trip Resistance	Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Max.	
				Min.	Max.				
MF-ESMD190	1.9	16	100	0.010	0.08	$\frac{11.61}{(0.457)}$	$\frac{5.33}{(0.210)}$	$\frac{0.63}{(0.025)}$	2

Available 3rd Quarter 2003! Consult factory for details.

MF-MSMF Series (1812 package) 6-13.2 Volts Surface Mount 0.50-1.50 Amps Hold Current

 Model	I ^{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance	1 Hour (R ₁) Post-Trip Resistance	Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Max.	
				Min.	Max.				
MF-MSMF050	0.50	15.0	100	0.15	1.00	$\frac{4.73}{(0.186)}$	$\frac{3.41}{(0.134)}$	$\frac{0.75}{(0.030)}$	3
MF-MSMF075	0.75	13.2	100	0.11	0.45	$\frac{4.73}{(0.186)}$	$\frac{3.41}{(0.134)}$	$\frac{0.75}{(0.030)}$	3
MF-MSMF110	1.10	6.0	100	0.04	0.21	$\frac{4.73}{(0.186)}$	$\frac{3.41}{(0.134)}$	$\frac{0.75}{(0.030)}$	3
MF-MSMF150	1.50	6.0	100	0.03	0.120	$\frac{4.73}{(0.186)}$	$\frac{3.41}{(0.134)}$	$\frac{0.75}{(0.030)}$	3

Strap Products



Features

- Axial/Radial Leaded
- Weldable Nickel Terminal
- Very Low Internal Resistance

Applications

- Rechargeable Battery Packs for Cellular Phones & Laptop Computers

MF-SVS Series (Lowest Available Resistance) 10 Volts Axial Leaded Strap 1.7-2.3 Amps Hold Current

Model	 I_{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance		1 Hour (R ₁) Post-Trip Resistance		Dimensions mm/(in)			Style
				Ohms at 23 °C				A Max.	B Max.	C Max.	
				Min.	Max.						
MF-SVS170	1.7	10	100	0.018	0.064	$\frac{18.0}{(0.709)}$	$\frac{5.5}{(0.216)}$	$\frac{0.9}{(0.035)}$		Std.	
MF-SVS170N	1.7	10	100	0.018	0.064	$\frac{24.0}{(0.945)}$	$\frac{3.9}{(0.153)}$	$\frac{0.9}{(0.035)}$		Std.	
MF-SVS175	1.75	10	100	0.017	0.060	$\frac{18.0}{(0.709)}$	$\frac{5.5}{(0.216)}$	$\frac{0.9}{(0.035)}$		Std.	
MF-SVS175N	1.75	10	100	0.017	0.060	$\frac{24.0}{(0.945)}$	$\frac{3.9}{(0.153)}$	$\frac{0.9}{(0.035)}$		Std.	
MF-SVS175NL	1.75	10	100	0.017	0.060	$\frac{28.0}{(1.102)}$	$\frac{3.9}{(0.153)}$	$\frac{0.9}{(0.035)}$		Std.	
MF-SVS210	2.1	10	100	0.010	0.040	$\frac{23.1}{(0.909)}$	$\frac{5.5}{(0.216)}$	$\frac{0.9}{(0.035)}$		Std.	
MF-SVS210N	2.1	10	100	0.010	0.040	$\frac{32.0}{(1.260)}$	$\frac{3.9}{(0.153)}$	$\frac{0.9}{(0.035)}$		Std.	
MF-SVS230	2.3	10	100	0.010	0.036	$\frac{23.1}{(0.909)}$	$\frac{5.5}{(0.216)}$	$\frac{0.9}{(0.035)}$		Std.	
MF-SVS230N	2.3	10	100	0.010	0.036	$\frac{32.0}{(1.260)}$	$\frac{3.9}{(0.153)}$	$\frac{0.9}{(0.035)}$		Std.	

MF-VS Series (Low Resistance & Low Temp.) 16 Volts Axial Leaded Strap 1.7-2.4 Amps Hold Current

100% LEAD FREE Model	I_{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance		1 Hour (R ₁) Post-Trip Resistance		Dimensions mm/(in)			Style
				Ohms at 23 °C							
				Min.	Max.	A Max.	B Max.	C Max.			
MF-VS170	1.7	16	100	0.030	0.105	18.0 (0.709)	5.5 (0.217)	0.9 (0.035)		Std.	
MF-VS170S	1.7	16	100	0.030	0.105	18.0 (0.709)	5.5 (0.217)	0.9 (0.035)		S	
MF-VS210	2.1	16	100	0.018	0.060	23.1 (0.909)	5.5 (0.217)	0.9 (0.035)		Std.	
MF-VS210L	2.1	16	100	0.018	0.060	26.5 (1.043)	5.5 (0.217)	0.9 (0.035)		Std.	
MF-VS210S	2.1	16	100	0.018	0.060	23.1 (0.909)	5.5 (0.217)	0.9 (0.035)		S	
MF-VS240	2.4	16	100	0.014	0.052	26.2 (1.031)	5.5 (0.217)	0.9 (0.035)		Std.	
MF-VS240S	2.4	16	100	0.014	0.052	26.2 (1.031)	5.5 (0.217)	0.9 (0.035)		S	

MF-VSN Series (Low Resistance Narrow) 12 Volts Axial Leaded Strap 1.7-2.1 Amps Hold Current

 Model	I _{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance		1 Hour (R ₁) Post-Trip Resistance		Dimensions mm/(in)			Style
				Ohms at 23 °C				A Max.	B Max.	C Max.	
				Min.	Max.						
MF-VS170N	1.7	12	100	0.030	0.105	$\frac{24.0}{(0.945)}$	$\frac{3.9}{(0.154)}$	$\frac{0.9}{(0.035)}$		Std.	
MF-VS175NL	1.75	12	100	0.029	0.102	$\frac{28.0}{(1.102)}$	$\frac{3.9}{(0.154)}$	$\frac{0.9}{(0.035)}$		Std.	
MF-VS210N	2.1	12	100	0.018	0.060	$\frac{32.0}{(1.260)}$	$\frac{3.9}{(0.154)}$	$\frac{0.9}{(0.035)}$		Std.	

MF-LR Series (Low Resistance) 10-16 Volts Axial Leaded Strap 1.90-6.00 Amps Hold Current

 Model	I _{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance		1 Hour (R ₁) Post-Trip Resistance			Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Max.				
				Min.	Max.							
MF-LR190	1.90	15	100	0.039	0.102	$\frac{22.1}{(0.870)}$	$\frac{5.2}{(0.205)}$	$\frac{1.0}{(0.039)}$				Std.
MF-LR190S	1.90	15	100	0.039	0.102	$\frac{22.1}{(0.870)}$	$\frac{5.2}{(0.205)}$	$\frac{1.0}{(0.039)}$				S
MF-LR260	2.60	15	100	0.020	0.063	$\frac{23.1}{(0.909)}$	$\frac{5.2}{(0.205)}$	$\frac{1.0}{(0.039)}$				Std.
MF-LR260S	2.60	15	100	0.020	0.063	$\frac{23.1}{(0.909)}$	$\frac{5.2}{(0.205)}$	$\frac{1.0}{(0.039)}$				S
MF-LR380	3.80	15	100	0.013	0.037	$\frac{26.0}{(1.024)}$	$\frac{7.5}{(0.295)}$	$\frac{1.0}{(0.039)}$				Std.
MF-LR450	4.50	16	100	0.011	0.028	$\frac{26.0}{(1.024)}$	$\frac{10.5}{(0.414)}$	$\frac{1.0}{(0.039)}$				Std.
MF-LR550	5.50	10	100	0.009	0.022	$\frac{37.0}{(1.457)}$	$\frac{7.5}{(0.295)}$	$\frac{1.0}{(0.039)}$				Std.
MF-LR600	6.00	10	100	0.007	0.016	$\frac{26.0}{(1.024)}$	$\frac{14.5}{(0.571)}$	$\frac{1.0}{(0.039)}$				Std.

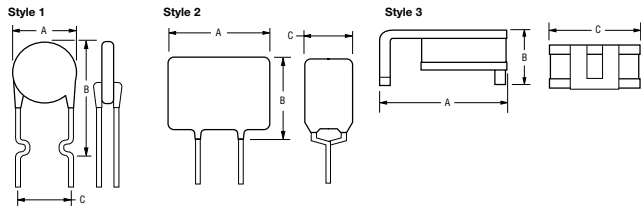
MF-LS Series (Lower Trip Temperature) 15-24 Volts Axial Leaded Strap 0.7-3.4 Amps Hold Current

		I_{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance		1 Hour (R₁) Post-Trip Resistance		Dimensions mm/(in)			Style	
Model					Ohms at 23 °C								
					Min.	Max.							
MF-LS070	0.7	15	100	0.100	0.340	<u>22.1</u> (0.870)	<u>5.2</u> (0.205)	<u>1.2</u> (0.047)			Std.		
MF-LS070S	0.7	15	100	0.100	0.340	<u>22.1</u> (0.870)	<u>5.2</u> (0.205)	<u>1.2</u> (0.047)			S		
MF-LS100S	1.0	24	100	0.070	0.260	<u>23.1</u> (0.909)	<u>5.2</u> (0.205)	<u>1.0</u> (0.039)			S		
MF-LS180	1.8	24	100	0.040	0.120	<u>26.0</u> (1.024)	<u>5.2</u> (0.205)	<u>1.0</u> (0.039)			Std.		
MF-LS180L	1.8	24	100	0.040	0.120	<u>37.5</u> (1.48)	<u>5.6</u> (0.22)	<u>1.0</u> (0.039)			Std.		
MF-LS180S	1.8	24	100	0.040	0.120	<u>26.0</u> (1.024)	<u>5.2</u> (0.205)	<u>1.0</u> (0.039)			S		
MF-LS190	1.9	24	100	0.030	0.100	<u>23.4</u> (0.921)	<u>11.0</u> (0.433)	<u>1.1</u> (0.043)			Std.		
MF-LS190RU	1.9	15	100	0.030	0.100	<u>20.8</u> (0.819)	<u>14.3</u> (0.563)	<u>0.76</u> (0.030)			RU		
MF-LS260	2.6	24	100	0.025	0.076	<u>26.0</u> (1.024)	<u>11.9</u> (0.469)	<u>1.0</u> (0.039)			Std.		
MF-LS300	3.0	24	100	0.015	0.055	<u>31.8</u> (1.252)	<u>13.5</u> (0.531)	<u>1.1</u> (0.043)			Std.		
MF-LS340	3.4	24	100	0.016	0.050	<u>26.0</u> (1.024)	<u>15.9</u> (0.626)	<u>1.0</u> (0.039)			Std.		

MF-S Series (Standard) 15-30 Volts Axial Leaded Strap 1.20-4.20 Amps Hold Current

		I _{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance		1 Hour (R ₁) Post-Trip Resistance		Dimensions mm/(in)			Style
Model					Ohms at 23 °C		A Max.	B Max.	C Max.			
					Min.	Max.						
MF-S120	1.20	15	100	0.085	0.220	22.1 (0.870)	5.2 (0.205)	1.0 (0.039)				Std.
MF-S120S	1.20	15	100	0.085	0.220	22.1 (0.870)	5.2 (0.205)	1.0 (0.039)				S
MF-S150	1.50	15	100	0.050	0.110	23.4 (0.921)	11.0 (0.433)	1.1 (0.043)				Std.
MF-S175	1.75	15	100	0.050	0.120	23.1 (0.909)	5.2 (0.205)	1.0 (0.039)				Std.
MF-S175S	1.75	15	100	0.050	0.120	23.1 (0.909)	5.2 (0.205)	1.0 (0.039)				S
MF-S200	2.00	30	100	0.030	0.080	23.4 (0.921)	11.0 (0.433)	1.1 (0.043)				Std.
MF-S350	3.50	30	100	0.017	0.040	31.8 (1.252)	13.5 (0.531)	1.1 (0.043)				Std.
MF-S420	4.20	30	100	0.012	0.040	32.4 (1.276)	13.6 (0.535)	1.1 (0.043)				Std.

Telecom Products



MF-R/90 Series Radial Leaded

90 Volts
0.55-0.75 Amps Hold Current

Model	I _{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance	1 Hour (R ₁) Post-Trip Resistance	Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Nom.	
				Min.	Max.				
MF-R055/90	0.55	90	10	0.45	2.0	<u>10.9</u> (0.43)	<u>14.0</u> (0.55)	<u>5.1</u> (0.201)	1
MF-R055/90U	0.55	90	10	0.45	2.0	<u>10.3</u> (0.4)	<u>10.3</u> (0.4)	<u>5.1</u> (0.201)	1
MF-R075/90	0.75	90	10	0.37	1.65	<u>11.9</u> (0.47)	<u>15.5</u> (0.61)	<u>5.1</u> (0.201)	1

MF-R/600 Series Radial Leaded

60 Volts
600 Vrms short duration interrupt
0.15-0.16 Amps Hold Current

Model	I ^h _{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance	1 Hour (R ₁) Post-Trip Resistance	Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Max.	
				Min.	Max.				
MF-R015/600	0.15	60	3.0	6.0	22.0	$\frac{13.5}{(0.531)}$	$\frac{12.6}{(0.496)}$	$\frac{6.0}{(0.236)}$	2
MF-R015/600-A	0.15	60	3.0	7.0	20.0	$\frac{13.5}{(0.531)}$	$\frac{12.6}{(0.496)}$	$\frac{6.0}{(0.236)}$	2
MF-R015/600-B	0.15	60	3.0	9.0	22.0	$\frac{13.5}{(0.531)}$	$\frac{12.6}{(0.496)}$	$\frac{6.0}{(0.236)}$	2
MF-R015/600-F	0.15	60	3.0	7.0	22.0	$\frac{13.5}{(0.531)}$	$\frac{12.6}{(0.496)}$	$\frac{6.0}{(0.236)}$	2
MF-R016/600	0.16	60	3.0	4.0	18.0	$\frac{16.0}{(0.629)}$	$\frac{12.6}{(0.496)}$	$\frac{6.0}{(0.236)}$	2
MF-R016/600-A	0.16	60	3.0	4.0	16.0	$\frac{16.0}{(0.629)}$	$\frac{12.6}{(0.496)}$	$\frac{6.0}{(0.236)}$	2
MF-R016/600-1	0.16	60	3.0	4.0	17.0	$\frac{16.0}{(0.629)}$	$\frac{12.6}{(0.496)}$	$\frac{6.0}{(0.236)}$	2

MF-SM013/250 Series Surface Mount

60 Volts
250 Vrms short duration interrupt
0.13 Amps Hold Current

 Model	I _{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance	1 Hour (R ₁) Post-Trip Resistance	Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Max.	
				Min.	Max.				
MF-SM013/250-2	0.13	60	3.0	6.5	20.0	9.4 (0.370)	3.4 (0.133)	7.4 (0.291)	3
MF-SM013/250-A-2	0.13	60	3.0	6.5	20.0	9.4 (0.370)	3.4 (0.133)	7.4 (0.291)	3
MF-SM013/250-B-2	0.13	60	3.0	9.0	20.0	9.4 (0.370)	3.4 (0.133)	7.4 (0.291)	3
MF-SM013/250-C-2	0.13	60	3.0	7.0	20.0	9.4 (0.370)	3.4 (0.133)	7.4 (0.291)	3

Features

- Ability to Withstand Lightning Surge
- Ability to Withstand AC Power Cross
- Available in Matched Resistance “Bins”

Applications

- CPE and Central Office
- Access Equipment
- Hybrid-Fiber Coax

MF-R/250 Series

60 Volts

(High Lightning Withstand)

250 Vrms short duration interrupt

Radial Leaded

0.08-0.18 Amps Hold Current

Model	I _{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance	1 Hour (R ₁) Post-Trip Resistance	Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Max.	
				Min.	Max.				
MF-R008/250U	0.08	60	3.0	14.0	33.0	6.2 (0.244)	11.5 (0.453)	5.1 (0.201)	2
MF-R008/250	0.08	60	3.0	15.0	33.0	7.5 (0.295)	11.5 (0.453)	5.1 (0.201)	
MF-R011/250U	0.11	60	3.0	5.0	16.0	6.2 (0.244)	11.5 (0.453)	5.1 (0.201)	2
MF-R012/250	0.12	60	3.0	4.0	16.0	7.5 (0.295)	11.5 (0.453)	5.1 (0.201)	2
MF-R012/250-A	0.12	60	3.0	7.0	16.0	7.5 (0.295)	11.5 (0.453)	5.1 (0.201)	2
MF-R012/250-C	0.12	60	3.0	5.5	14.0	7.5 (0.295)	11.5 (0.453)	5.1 (0.201)	2
MF-R012/250-F	0.12	60	3.0	6.0	16.0	7.5 (0.295)	11.5 (0.453)	5.1 (0.201)	2
MF-R012/250-1	0.12	60	3.0	6.0	16.0	7.5 (0.295)	11.5 (0.453)	5.1 (0.201)	2
MF-R012/250-2	0.12	60	3.0	8.0	16.0	7.5 (0.295)	11.5 (0.453)	5.1 (0.201)	2
MF-R012/250U	0.12	60	3.0	6.0	16.0	6.2 (0.244)	11.5 (0.453)	5.1 (0.201)	2
MF-R014/250	0.145	60	3.0	3.0	12.0	7.5 (0.295)	11.5 (0.453)	5.1 (0.201)	2
MF-R014/250-A	0.145	60	3.0	3.0	12.0	7.5 (0.295)	11.5 (0.453)	5.1 (0.201)	2
MF-R014/250-B	0.145	60	3.0	4.5	14.0	7.5 (0.295)	11.5 (0.453)	5.1 (0.201)	2
MF-R014/250U	0.145	60	3.0	3.5	12.0	6.2 (0.244)	11.5 (0.453)	5.1 (0.201)	2
MF-R018/250U	0.18	60	10.0	0.8	4.0	10.4 (0.409)	12.6 (0.496)	5.1 (0.201)	2

MF-RX/250 Series

60 Volts

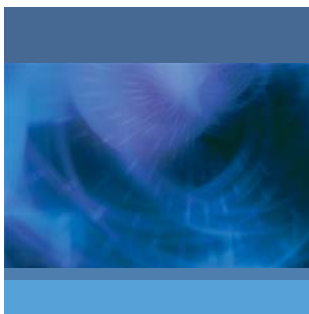
(Fast Trip, Small Package)

250 Vrms short duration interrupt

Radial Leaded

0.12-0.18 Amps Hold Current

Model	I _{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance	1 Hour (R ₁) Post-Trip Resistance	Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Nom.	
				Min.	Max.				
MF-RX012/250	0.12	60	3.0	4.0	16.0	$\frac{6.5}{(0.256)}$	$\frac{11.0}{(0.433)}$	$\frac{5.1}{(0.201)}$	2
MF-RX012/250-A	0.12	60	3.0	7.0	16.0	$\frac{6.5}{(0.256)}$	$\frac{11.0}{(0.433)}$	$\frac{5.1}{(0.201)}$	2
MF-RX012/250-C	0.12	60	3.0	5.5	14.0	$\frac{6.5}{(0.256)}$	$\frac{11.0}{(0.433)}$	$\frac{5.1}{(0.201)}$	2
MF-RX012/250-F	0.12	60	3.0	6.0	16.0	$\frac{6.5}{(0.256)}$	$\frac{11.0}{(0.433)}$	$\frac{5.1}{(0.201)}$	2
MF-RX012/250-1	0.12	60	3.0	6.0	16.0	$\frac{6.5}{(0.256)}$	$\frac{11.0}{(0.433)}$	$\frac{5.1}{(0.201)}$	2
MF-RX012/250-2	0.12	60	3.0	8.0	16.0	$\frac{6.5}{(0.256)}$	$\frac{11.0}{(0.433)}$	$\frac{5.1}{(0.201)}$	2
MF-RX012/250-T	0.12	60	3.0	7.0	16.0	$\frac{6.5}{(0.256)}$	$\frac{11.0}{(0.433)}$	$\frac{5.1}{(0.201)}$	2
MF-RX012/250U	0.12	60	3.0	6.0	16.0	$\frac{6.0}{(0.236)}$	$\frac{10.0}{(0.394)}$	$\frac{5.1}{(0.201)}$	2
MF-RX014/250	0.145	60	3.0	3.0	14.0	$\frac{6.5}{(0.256)}$	$\frac{11.0}{(0.433)}$	$\frac{5.1}{(0.201)}$	2
MF-RX014/250-A	0.145	60	3.0	3.0	12.0	$\frac{6.5}{(0.256)}$	$\frac{11.0}{(0.433)}$	$\frac{5.1}{(0.201)}$	2
MF-RX014/250-B	0.145	60	3.0	4.5	14.0	$\frac{6.5}{(0.256)}$	$\frac{11.0}{(0.433)}$	$\frac{5.1}{(0.201)}$	2
MF-RX014/250-T	0.145	60	3.0	5.4	14.0	$\frac{6.5}{(0.256)}$	$\frac{11.0}{(0.433)}$	$\frac{5.1}{(0.201)}$	2
MF-RX014/250U	0.145	60	3.0	3.5	12.0	$\frac{6.0}{(0.236)}$	$\frac{10.0}{(0.394)}$	$\frac{5.1}{(0.201)}$	2
MF-RX018/250	0.18	60	10.0	0.8	4.0	$\frac{11.0}{(0.433)}$	$\frac{13.6}{(0.535)}$	$\frac{5.1}{(0.201)}$	2
MF-RX018/250U	0.18	60	10.0	0.8	4.0	$\frac{10.4}{(0.409)}$	$\frac{12.6}{(0.496)}$	$\frac{5.1}{(0.201)}$	2



Worldwide Sales Offices

Country	Phone	Fax
Benelux:	+31-70-3004333	+31-70-3004345
China:	+86-21-64821250	+86-21-64821249
France:	+33-254-735151	+33-254-735156
Germany:	+49-69-80078212	+49-69-80078299
Hong Kong:	+852-2411 5599	+852-2412 3611
Ireland:	+44-1276-691087	+44-1276-691088
Italy:	+39-02-38900041	+39-02-38900042
Japan:	+81-49-269 3204	+81-49-269 3297
Singapore:	+65-63461933	+65-63461911
Switzerland:	+41-41-7685555	+41-41-7685510
Taiwan:	+886-2-25624117	+886-2-25624116
UK:	+44-1276-691087	+44-1276-691088
USA:	+1-909-781-5500	+1-909-781-5006
Non-Listed European Countries:	+41- 41-7685555	+41- 41-7685510

Technical Assistance

Region	Phone	Fax
Asia-Pacific:	+886-2-25624117	+886-2-25624116
Europe:	+41- 41-7685555	+41- 41-7685510
North America:	+1-909-781-5500	+1-909-781-5700

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