Bourns® Multifuse® Resettable Fuses

Polymeric PTC & Ceramic PTC Short Form Brochure

70TH ANNIVERSARY
BOURNS®
1947 ★ 2017

The Bourns® Multifuse® family of Polymeric 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.

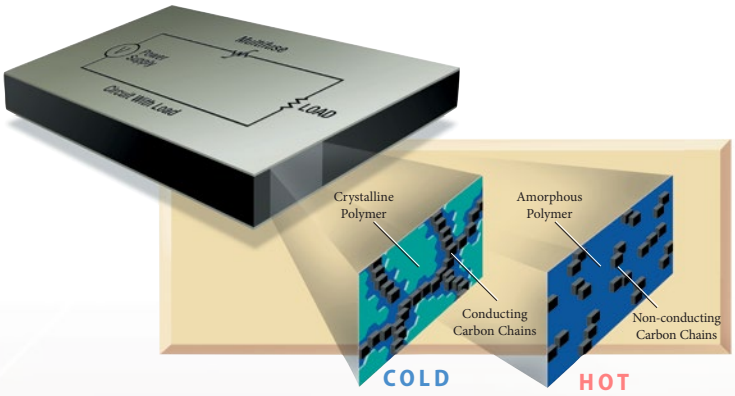
Features/Benefits

- Resettable overcurrent protection
- Heat element
- Agency recognition - UL, CSA, TÜV
- AEC-Q200 Qualified
- Standard footprints
- Standard packaging options
- Extra low resistance
- RoHS compliance standard
- Custom designs available

Applications

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

Multifuse® Products – How They Work

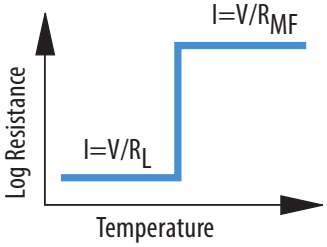


Resettable fuses are manufactured in the form of a conductive plastic, which is comprised of a non-conductive crystalline polymer with highly conductive carbon black particles impregnated throughout the crystal lattice. Because of the close proximity of the carbon black particles within the crystal lattice, under normal conditions current is allowed to flow easily through the conductive plastic. However under a fault condition, when there is an increase in current, the conductive plastic heats at the rate of I^2R. As the material continues to heat, it eventually reaches the phase transformation temperature, which changes the crystal structure into an amorphous structure. Once the material has transformed into this amorphous structure, the conductive particles become isolated and are unable to conduct current hence the drastic change in material resistance. It is only when the current is removed that the material is allowed to cool and return to its original crystal structure.

Agency File Numbers

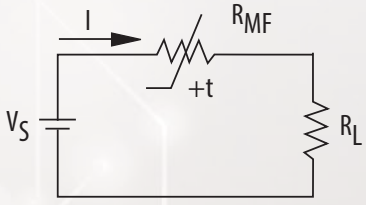
UL File Number	E 174545S
CSA File Number	CA 110338
TÜV File Number	R2057213

Multifuse® Products – How They Are Used



PTC Response Characteristic

It is the materials used in resettable fuses that allow them to reset after a fault condition has been removed. Resettable fuses exhibit a positive temperature coefficient effect when heated. While many materials exhibit a PTC effect when heated (an increase in resistance in response to a positive change in temperature), what makes the material used in resettable fuses unique is the fact that the increase in resistance changes exponentially rather than in a linear manner.



Typical Circuit Application

It is because of this transformation from a low resistance state to a high resistance state that allows the resettable fuse to protect loads. It is this transition from the low resistance state to high resistance state that is referred to as tripping. The time it takes for a resettable fuse to trip is relatively quick, depending on how high the fault current is and it can be as quick as a fraction of a second. Hence they are an excellent form of protection for most applications where sensitive devices need extra protection.

How To Order

MF-RX 012/250 U - A 05 - 2 - X

Bourns® Multifuse® Product Designator

Series
RX = Radial Leaded
R = Radial Leaded
RG = Radial Leaded
RHT = High Temp. Radial Leaded
RM = AC Line Voltage Radial Leaded
FSMF = Surface Mount (0603)
PSMF = Surface Mount (0805)
PSML = Surface Mount (0805)
PSHT = Surface Mount (0805)
NSMF = Surface Mount (1206)
NSML = Surface Mount (1206)
NSHT = Surface Mount (1206)
USMF = Surface Mount (1210)
USML = Surface Mount (1210)
USHT = Surface Mount (1210)
MSMF = Surface Mount (1812)
SMDF = Surface Mount (2018)
LSMF = Surface Mount (2920)
SM = Surface Mount
SMHT = High Temp. Surface Mount
SD = Dual Package Surface Mount
LR = Axial Leaded Strap
LS = Axial Leaded Strap
S = Axial Leaded Strap
SVS = Axial Leaded Strap
VS = Axial Leaded Strap
VSN = Axial Leaded Strap
D = Disc/Chip Configuration

Hold Current, I_{hold}

Voltage Options:
Max. Interrupt Voltage, V

Construction Options:
N = Narrow Device Option (3.6 mm)*
U = Uncoated

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***

Part Number Suffix Option
- 14 = Kinked Leads in Place of Standard Straight Leads
- 17 = Straight Leads in Place of Standard Kinked Lead

Axial Leaded Strap products only.
***Telecom Radial Leaded products only.*
****Radial Leaded products only.*

Definitions

Agency Approvals
Bourns® PPTCs are certified under UL, CSA, IEC and TÜV registration programs.

Current, Hold (I_{hold})
The maximum current a PPTC device can pass without interruption.

Current, Maximum (I_{max})
The maximum fault current a PPTC device can withstand without damage at the rated voltage.

Current, Trip (I_{trip})
The minimum current that will switch a PPTC from the low resistance to the high resistance state.

Fault Current
The peak current that flows through a PPTC or wire during a short circuit or arc back.

Positive Temperature Coefficient (PTC)
A characteristic of the PPTC 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 PPTC device has been tripped and power has been removed.

Resistance, Post Reflow (R_{1max})
The maximum resistance one hour after a PPTC surface mount device has been reflow soldered.

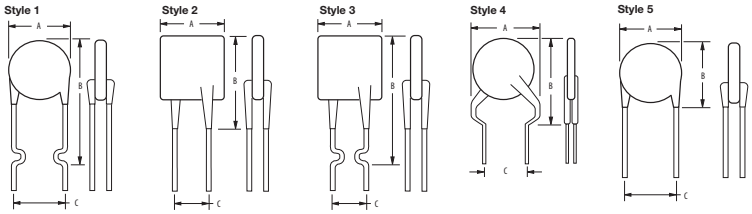
Voltage, Maximum (V_{max})
The maximum voltage a PPTC device can withstand without damage at the rated current.

Product Selection Guide

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 http://www.bourns.com/products/circuit-protection/resettable-fuses-multifuse-pptc.

Radial Leaded Low Voltage Products



Features

- Bulk or tape & 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 Ohms at 23 °C Min.	Initial Resistance Ohms at 23 °C Max.	1 Hour (R_1) Post-Trip Resistance Ohms at 23 °C	Dimensions mm/(in) A Max.	Dimensions mm/(in) B Max.	Dimensions mm/(in) C Nom.	Style
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		12.0 (0.472)	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-RG Series
Radial Leaded 16 V

Operating Temperature
-40 °C ~ 85 °C

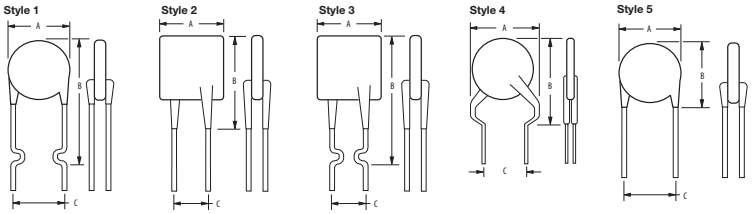
Model	I_{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance Ohms at 23 °C Min.	Initial Resistance Ohms at 23 °C Max.	1 Hour (R_1) Post-Trip Resistance Ohms at 23 °C	Dimensions mm/(in) A Max.	Dimensions mm/(in) B Max.	Dimensions mm/(in) C Nom.	Style
MF- RG300	3.0	16	100	38	64.5		7.1 (0.28)	11.0 (0.443)	5.1 ±0.7 (0.201 ±0.028)	2
MF- RG400	4.0	16	100	21	38.5		8.9 (0.35)	12.8 (0.443)	5.1 ±0.7 (0.201 ±0.028)	2
MF- RG500	5.0	16	100	15	23		10.4 (0.409)	14.3 (0.563)	5.1 ±0.7 (0.201 ±0.028)	2
MF- RG600	6.0	16	100	10	18.5		10.7 (0.421)	17.1 (0.673)	5.1 ±0.7 (0.201 ±0.028)	2
MF- RG650	6.5	16	100	8.8	15.8		11.24 (0.441)	19.7 (0.776)	5.1 ±0.7 (0.201 ±0.028)	2
MF- RG700	7.0	16	100	7.7	13.0		11.2 (0.441)	19.7 (0.776)	5.1 ±0.7 (0.201 ±0.028)	2
MF- RG800	8.0	16	100	5.6	11		12.7 (0.500)	20.9 (0.823)	5.1 ±0.7 (0.201 ±0.028)	2
MF- RG900	9.0	16	100	4.7	9.2		14.0 (0.551)	21.7 (0.854)	5.1 ±0.7 (0.201 ±0.028)	2
MF- RG1000	10.0	16	100	4.0	7.1		16.5 (0.650)	21.7 (0.854)	5.1 ±0.7 (0.201 ±0.028)	2
MF- RG1100	11.0	16	100	3.7	6.2		17.5 (0.689)	26 (1.024)	5.1 ±0.7 (0.201 ±0.028)	2

MF-RHT Series
Radial Leaded High Temperature

Operating Temperature
-40 °C ~ +125 °C

Model	I_{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance Ohms at 23 °C Min.	Initial Resistance Ohms at 23 °C Max.	1 Hour (R_1) Post-Trip Resistance Ohms at 23 °C	Dimensions mm/(in) A Max.	Dimensions mm/(in) B Max.	Dimensions mm/(in) C Nom.	Style
MF-RHT050	0.5	16	40	0.48	1.1		7.4 (0.291)	12.7 (0.5)	5.1 (0.201)	3
MF-RHT070	0.7	16	40	0.3	0.8		6.86 (0.27)	10.8 (0.425)	5.1 (0.201)	3
MF-RHT200	2.0	16	100	0.045	0.110		9.4 (0.37)	14.0 (0.55)	5.1 (0.201)	1
MF-RHT200/32	2.0	32	50	0.045	0.110		9.4 (0.37)	14.0 (0.55)	5.1 (0.201)	1
MF-RHT450	4.5	16	100	0.022	0.054		10.4 (0.41)	15.6 (0.61)	5.1 (0.201)	2
MF-RHT650	6.5	16	100	0.011	0.026		12.7 (0.5)	22.2 (0.88)	5.1 (0.201)	2
MF-RHT750	7.5	16	100	0.0094	0.022		14.0 (0.55)	23.5 (0.93)	5.1 (0.201)	2
MF-RHT1300	13.0	16	100	0.0041	0.01		23.5 (0.925)	28.7 (1.17)	10.2 (0.402)	2

Radial Leaded Low Voltage Products



Features
- Bulk or tape & reel packaging
- Industry standard sizes

Applications
- Computers and peripherals
- General electronics
- Automotive
- Consumer appliances
- Electronic toys

MF-RX/72 Series
Radial Leaded

72 Volts
0.20 – 3.75 Amps Hold Current

Model	I_{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance Ohms at 23 °C Min.	Initial Resistance Ohms at 23 °C Max.	1 Hour (R_1) Post-Trip Resistance Ohms at 23 °C Max.	Dimensions mm/(in) A Max.	Dimensions mm/(in) B Max.	Dimensions mm/(in) C Nom.	Style
MF-RX020/72	0.20	72	40	1.50	4.40		7.4 (0.291)	12.7 (0.500)	5.1 (0.201)	1
MF-RX025/72	0.25	72	40	1.00	3.00		7.4 (0.291)	12.7 (0.500)	5.1 (0.201)	1
MF-RX030/72	0.30	72	40	0.76	2.10		7.4 (0.291)	13.4 (0.528)	5.1 (0.201)	1
MF-RX040/72	0.40	72	40	0.52	1.29		7.4 (0.291)	13.7 (0.539)	5.1 (0.201)	1
MF-RX050/72	0.50	72	40	0.41	1.17		7.9 (0.311)	13.7 (0.539)	5.1 (0.201)	1
MF-RX065/72	0.65	72	40	0.27	0.72		9.7 (0.382)	15.2 (0.598)	5.1 (0.201)	1
MF-RX075/72	0.75	72	40	0.18	0.60		10.4 (0.409)	16.0 (0.630)	5.1 (0.201)	1
MF-RX090/72	0.90	72	40	0.14	0.47		11.7 (0.461)	16.7 (0.657)	5.1 (0.201)	1
MF-RX110/72	1.10	72	40	0.15	0.38		10.84 (0.427)	16.84 (0.662)	5.1 (0.201)	2
MF-RX135/72	1.35	72	40	0.12	0.30		12.26 (0.483)	18.26 (0.718)	5.1 (0.201)	2
MF-RX160/72	1.60	72	40	0.09	0.22		13.94 (0.549)	19.94 (0.785)	5.1 (0.201)	2
MF-RX185/72	1.85	72	40	0.08	0.19		15.18 (0.598)	21.18 (0.833)	5.1 (0.201)	2
MF-RX250/72	2.50	72	40	0.05	0.13		17.84 (0.702)	23.84 (0.938)	10.2 (0.402)	2
MF-RX300/72	3.00	72	40	0.04	0.10		20.67 (0.814)	26.67 (1.050)	10.2 (0.402)	2
MF-RX375/72	3.75	72	40	0.03	0.08		23.51 (0.926)	29.51 (1.161)	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 Ohms at 23 °C Min.	Initial Resistance Ohms at 23 °C Max.	1 Hour (R_1) Post-Trip Resistance Ohms at 23 °C Max.	Dimensions mm/(in) A Max.	Dimensions mm/(in) B Max.	Dimensions mm/(in) C Nom.	Style
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

Not recommended for new designs, suggest using new **MF-RX/72 Series*

MF-RM 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 Ohms at 23 °C Min.	Initial Resistance Ohms at 23 °C Max.	1 Hour (R_1) Post-Trip Resistance Ohms at 23 °C Max.	Dimensions mm/(in) A Max.	Dimensions mm/(in) B Max.	Dimensions mm/(in) C Nom.	Style
MF-RM005/240	0.05	240	1.0	18.50	65.00		8.3 (0.327)	12.9 (0.508)	5.1 (0.201)	2
MF-RM008/240	0.08	240	1.2	7.40	26.00		8.3 (0.327)	12.9 (0.508)	5.1 (0.201)	2
MF-RM012/240	0.12	240	1.2	3.00	12.00		8.3 (0.327)	12.9 (0.508)	5.1 (0.201)	2
MF-RM016/240	0.16	240	2.0	2.50	7.80		9.9 (0.390)	13.8 (0.543)	5.1 (0.201)	2
MF-RM025/240	0.25	240	3.5	1.30	3.80		10.0 (0.394)	20.0 (0.787)	5.1 (0.201)	2
MF-RM033/240	0.33	240	4.5	0.77	2.60		11.4 (0.449)	20.0 (0.787)	5.1 (0.201)	2
MF-RM040/240	0.40	240	5.5	0.60	1.90		11.5 (0.453)	20.9 (0.823)	5.1 (0.201)	2
MF-RM055/240	0.55	240	7.0	0.45	1.45		14.0 (0.551)	22.4 (0.882)	5.1 (0.201)	2

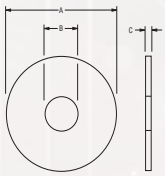
Disc & Chip Type PTC Products

MF-D Series*
Disc Configuration

15 Volts
2.5 – 12.2 Amps Hold Current

Model	I_{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance Ohms at 23 °C Min.	Initial Resistance Ohms at 23 °C Max.	1 Hour (R_1) Post-Trip Resistance Ohms at 23 °C Max.	Dimensions mm/(in) A Max.	Dimensions mm/(in) B Max.	Dimensions mm/(in) C Max.	Style
MF-D	2.5	15	10	0.015	0.032		14.4 (0.567)	6.3 (0.248)	0.36 (0.014)	1
MF-D	3.5	15	20	0.015	0.032		16.4 (0.646)	10.0 (0.394)	0.36 (0.014)	1
MF-D	5.5	15	40	0.014	0.30		16.08 (0.633)	9.0 (0.354)	0.36 (0.014)	1
MF-D	12.2	15	50	0.007	0.017		2.4 (0.945)	–	0.36 (0.014)	1

**For ordering information, contact your Bourns representative.*

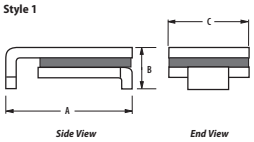


Features
- Custom designs to meet appropriate applications
- Compatible with current industry standards
- Overcurrent and overtemperature protection
- Standard and low temperature material
- Patents pending

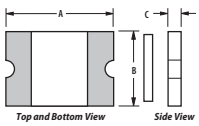
Applications
- Lithium cells
- Battery cells
- Powered toys
- Motors

Surface Mount Low Voltage Products

Style 1



Style 2



Features

- Tape & reel packaging
- Industry standard sizes

Applications

- Computers and peripherals
- General electronics
- Automotive

MF-SM Series (3425 package) — 15 - 33 Volts
Surface Mount (8763 mm) — 1.50 – 2.50 Amps Hold Current

Model	I_{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance Ohms at 23 °C Min.	1 Hour (R_1) Post-Trip Resistance Ohms at 23 °C Max.	Dimensions mm/(in) A Max.	B Max.	C Max.	Style
MF-SM150	1.50	15	100	0.06	0.25	9.50 (0.374)	3.0 (0.118)	6.71 (0.264)	1
MF-SM150/33	1.50	33	40	0.06	0.23	9.50 (0.374)	3.0 (0.118)	6.71 (0.264)	1
MF-SM185/33	1.80	33	40	0.04	0.15	9.50 (0.374)	3.0 (0.118)	6.71 (0.264)	1
MF-SM200	2.00	15	100	0.045	0.125	9.50 (0.374)	3.0 (0.118)	6.71 (0.264)	1
MF-SM250	2.50	15	100	0.024	0.085	9.50 (0.374)	3.0 (0.118)	6.71 (0.264)	1

MF-SM Series (2920 package) — 6-60 Volts
Surface Mount (7555 mm) — 0.30 – 3.00 Amps Hold Current

Model	I_{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance Ohms at 23 °C Min.	1 Hour (R_1) Post-Trip Resistance Ohms at 23 °C Max.	Dimensions mm/(in) A Max.	B Max.	C Nom.	Style
MF-SM030	0.30	60	40	0.90	4.80	7.98 (0.314)	3.18 (0.125)	5.44 (0.214)	1
MF-SM050	0.50	60	40	0.35	1.40	7.98 (0.314)	3.18 (0.125)	5.44 (0.214)	1
MF-SM075	0.75	30	80	0.23	1.00	7.98 (0.314)	3.18 (0.125)	5.44 (0.214)	1
MF-SM075/60	0.75	60	10	0.23	1.00	7.98 (0.314)	3.18 (0.125)	5.44 (0.214)	1
MF-SM100	1.10	30	80	0.12	0.48	7.98 (0.314)	3.0 (0.118)	5.44 (0.214)	1
MF-SM100/33	1.10	33	40	0.12	0.41	7.98 (0.314)	3.0 (0.118)	5.44 (0.214)	1
MF-SM125	1.25	15	100	0.07	0.25	7.98 (0.314)	3.0 (0.118)	5.44 (0.214)	1
MF-SM260	2.60	6	100	0.025	0.075	7.98 (0.314)	3.0 (0.118)	5.44 (0.214)	1
MF-SM300	3.00	6	100	0.015	0.048	7.98 (0.314)	3.0 (0.118)	5.44 (0.214)	1

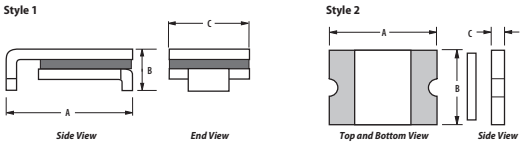
MF-NSMF Series (1206 package) — 6 - 30 Volts
Surface Mount (3216 mm) — 0.12 – 2.00 Amps Hold Current

Model	I_{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance Ohms at 23 °C Min.	1 Hour (R_1) Post-Trip Resistance Ohms at 23 °C Max.	Dimensions mm/(in) A Max.	B Max.	C Max.	Style
MF-NSMF012	0.12	30	10	1.35	8.50	3.4 (0.134)	1.8 (0.071)	1.1 (0.043)	2
MF-NSMF020	0.20	24	10	0.60	2.60	3.4 (0.134)	1.8 (0.071)	0.85 (0.033)	2
MF-NSMF035	0.35	6	100	0.30	1.20	3.4 (0.134)	1.8 (0.071)	0.85 (0.033)	2
MF-NSMF050	0.50	13.2	100	0.15	0.70	3.4 (0.134)	1.8 (0.071)	0.85 (0.033)	2
MF-NSMF075	0.75	6	100	0.10	0.40	3.4 (0.134)	1.8 (0.071)	0.7 (0.028)	2
MF-NSMF110	1.10	6	100	0.06	0.20	3.4 (0.134)	1.8 (0.071)	0.7 (0.028)	2
MF-NSMF150	1.50	6	100	0.03	0.13	3.4 (0.134)	1.8 (0.071)	0.7 (0.028)	2
MF-NSMF200	2.00	6	100	0.02	0.085	3.5 (0.138)	1.8 (0.071)	1.6 (0.063)	2

MF-MSMF Series (1812 package) — 6 – 60 Volts
Surface Mount (4532 mm) — 0.10 – 2.60 Amps Hold Current

Model	I_{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance Ohms at 23 °C Min.	1 Hour (R_1) Post-Trip Resistance Ohms at 23 °C Max.	Dimensions mm/(in) A Max.	B Max.	C Max.	Style
MF-MSMF010	0.10	60	40	0.70	15.0	4.73 (0.186)	3.41 (0.134)	1.10 (0.043)	2
MF-MSMF014	0.14	60	40	0.40	6.50	4.73 (0.186)	3.41 (0.134)	1.10 (0.043)	2
MF-MSMF020	0.20	30	80	0.40	6.00	4.73 (0.186)	3.41 (0.134)	1.10 (0.043)	2
MF-MSMF020/60	0.20	60	40	0.40	6.00	4.73 (0.186)	3.41 (0.134)	1.10 (0.043)	2
MF-MSMF030	0.30	30	10	0.30	3.00	4.73 (0.186)	3.41 (0.134)	1.10 (0.043)	2
MF-MSMF050	0.50	15	100	0.15	1.00	4.73 (0.186)	3.41 (0.134)	0.85 (0.033)	2
MF-MSMF050/30X	0.50	30	100	0.15	1.00	4.73 (0.186)	3.41 (0.134)	0.85 (0.033)	2
MF-MSMF050/40X	0.50	40	100	0.15	1.00	4.73 (0.186)	3.41 (0.134)	0.85 (0.033)	2
MF-MSMF075	0.75	13.2	100	0.11	0.45	4.73 (0.186)	3.41 (0.134)	0.85 (0.033)	2
MF-MSMF075/24	0.75	24	40	0.11	0.45	4.73 (0.186)	3.41 (0.134)	0.85 (0.033)	2
MF-MSMF110	1.10	6	100	0.04	0.21	4.73 (0.186)	3.41 (0.134)	0.85 (0.033)	2
MF-MSMF110/16	1.10	16	100	0.04	0.21	4.73 (0.186)	3.41 (0.134)	0.85 (0.033)	2
MF-MSMF125	1.25	6	100	0.035	0.14	4.73 (0.186)	3.41 (0.134)	0.85 (0.033)	2
MF-MSMF150	1.50	6	100	0.03	0.12	4.73 (0.186)	3.41 (0.134)	0.85 (0.033)	2
MF-MSMF150/12	1.50	12	100	0.03	0.12	4.73 (0.186)	3.41 (0.134)	0.85 (0.033)	2
MF-MSMF160	1.60	8	100	0.035	0.099	4.73 (0.186)	3.41 (0.134)	0.85 (0.033)	2
MF-MSMF200	2.00	8	40	0.020	0.08	4.73 (0.186)	3.41 (0.134)	0.85 (0.033)	2
MF-MSMF250/16	2.50	16	100	0.015	0.1	4.73 (0.186)	3.41 (0.134)	2.00 (0.078)	2
MF-MSMF260	2.60	6	100	0.015	0.08	4.73 (0.186)	3.41 (0.134)	0.85 (0.033)	2

Surface Mount Low Voltage Products



Features

- Tape & reel packaging
- Industry standard sizes

Applications

- Computers and peripherals
- General electronics
- Automotive

MF-SMDF Series (2018 package) — 10 – 60 Volts
Surface Mount (5050 mm) — 0.30 – 2.00 Amps Hold Current

Model	I_{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance Ohms at 23 °C Min.	Initial Resistance Ohms at 23 °C Max.	1 Hour (R_1) Post-Trip Resistance Ohms at 23 °C	Dimensions mm/(in) A Max.	Dimensions mm/(in) B Max.	Dimensions mm/(in) C Max.	Style
MF-SMDF030	0.30	60	20	0.45	2.150		5.44 (0.214)	4.93 (0.194)	1.09 (0.043)	2
MF-SMDF050	0.55	60	10	0.20	1		5.44 (0.214)	4.93 (0.194)	1.09 (0.043)	2
MF-SMDF100/33X	1.00	32	50	0.045	0.110		5.44 (0.214)	4.93 (0.194)	1.25 (0.049)	2
MF-SMDF150	1.50	15	40	0.05	0.17		5.44 (0.214)	4.93 (0.194)	0.85 (0.033)	2
MF-SMDF200	2.00	10	40	0.03	0.1		5.44 (0.214)	4.93 (0.194)	0.85 (0.033)	2
MF-SMDF260/24X	2.60	32	50	0.045	0.110		5.44 (0.214)	4.93 (0.194)	2.00 (0.079)	2

MF-PSMF Series (0805 package) — 6-33 Volts
Surface Mount (7555 mm) — 1.85 – 3.00 Amps Hold Current

Model	I_{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance Ohms at 23 °C Min.	Initial Resistance Ohms at 23 °C Max.	1 Hour (R_1) Post-Trip Resistance Ohms at 23 °C	Dimensions mm/(in) A Max.	Dimensions mm/(in) B Max.	Dimensions mm/(in) C Max.	Style
MF-PSMF010/24X	0.10	24	80	1.00	7.500		2.30 (0.091)	1.50 (0.059)	0.85 (0.033)	2
MF-PSMF020X	0.20	9	40	0.65	3.500		2.30 (0.091)	1.50 (0.059)	0.85 (0.033)	2
MF-PSMF035X	0.35	6	40	0.25	1.200		2.30 (0.091)	1.50 (0.059)	0.85 (0.033)	2
MF-PSMF050X	0.50	6	40	0.15	0.900		2.30 (0.091)	1.50 (0.059)	0.85 (0.033)	2
MF-PSMF075X	0.75	6	40	0.09	0.350		2.30 (0.091)	1.50 (0.059)	1.25 (0.049)	2
MF-PSMF110X	1.10	6	40	0.06	0.210		2.30 (0.091)	1.50 (0.059)	1.25 (0.049)	2

MF-USMF Series (1210 package) — 6 - 30 Volts
Surface Mount (3225 mm) — 0.05 – 1.75 Amps Hold Current

Model	I_{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance Ohms at 23 °C Min.	Initial Resistance Ohms at 23 °C Max.	1 Hour (R_1) Post-Trip Resistance Ohms at 23 °C	Dimensions mm/(in) A Max.	Dimensions mm/(in) B Max.	Dimensions mm/(in) C Max.	Style
MF-USMF005	0.05	30	10	2.80	50.0		3.43 (0.135)	2.8 (0.11)	1.1 (0.043)	2
MF-USMF010	0.10	30	10	0.80	15.0		3.43 (0.135)	2.8 (0.11)	1.1 (0.043)	2
MF-USMF020	0.20	30	10	0.40	5.00		3.43 (0.135)	2.8 (0.11)	1.1 (0.043)	2
MF-USMF035	0.35	6.0	40	0.20	1.30		3.43 (0.135)	2.8 (0.11)	0.85 (0.033)	2
MF-USMF050	0.50	13.2	40	0.18	0.90		3.43 (0.135)	2.8 (0.11)	0.85 (0.033)	2
MF-USMF075	0.75	6.0	40	0.07	0.45		3.43 (0.135)	2.8 (0.11)	0.85 (0.033)	2
MF-USMF110	1.10	6.0	40	0.05	0.21		3.43 (0.135)	2.8 (0.11)	0.85 (0.033)	2
MF-USMF150	1.50	6.0	40	0.03	0.11		3.43 (0.135)	2.8 (0.11)	0.85 (0.033)	2
MF-USMF175	1.75	6.0	40	0.02	0.09		3.43 (0.135)	2.8 (0.11)	0.85 (0.033)	2

MF-LSMF Series (2920 package) — 6-33 Volts
Surface Mount (7555 mm) — 1.85 – 4.00 Amps Hold Current

Model	I_{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance Ohms at 23 °C Min.	Initial Resistance Ohms at 23 °C Max.	1 Hour (R_1) Post-Trip Resistance Ohms at 23 °C	Dimensions mm/(in) A Max.	Dimensions mm/(in) B Max.	Dimensions mm/(in) C Max.	Style
MF-LSMF185/33X	1.85	33	40	0.045	0.150		7.98 (0.314)	5.44 (0.214)	1.60 (0.63)	2
MFLSMF260X	2.6	24	20	0.020	0.075		7.98 (0.314)	5.44 (0.214)	1.60 (0.63)	2
MF-LSMF300X	3.0	6	40	0.020	0.075		7.98 (0.314)	5.44 (0.214)	0.85 (0.033)	2
MF-LSMF300/24X	3.0	24	20	0.020	0.075		7.98 (0.314)	5.44 (0.214)	1.60 (0.63)	2
MF-LSMF400/12X	4.0	12	20	0.005	0.050		7.98 (0.314)	5.44 (0.214)	1.60 (0.63)	2

MF-SMHT Series — 16 Volts
Surface Mount/High Temperature — 1.36 – 1.60 Amps Hold Current (Working temp: -40 ~ +125 °C)

Model	I_{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance Ohms at 23 °C Min.	Initial Resistance Ohms at 23 °C Max.	1 Hour (R_1) Post-Trip Resistance Ohms at 23 °C	Dimensions mm/(in) A Max.	Dimensions mm/(in) B Max.	Dimensions mm/(in) C Max.	Style
MF-SMHT136	1.36	16	100	0.085	0.330		7.98 (0.314)	3.0 (0.118)	5.44 (0.214)	1
MF-SMHT160	1.60	16	100	0.050	0.150		9.5 (0.374)	3.0 (0.118)	6.71 (0.264)	1

MF-USHT Series (1210 package) — 0.35 – 0.50 Amps Hold Current
Surface Mount/High Temperature (Working Temp: -40 °C ~ +125 °C)

Model	Ihold Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance Ohms at 23 °C Min.	Initial Resistance Ohms at 23 °C Max.	1 Hour (R1) Post-Trip Resistance Ohms at 23 °C	Dimensions mm/(in) A Max.	Dimensions mm/(in) B Max.	Dimensions mm/(in) C Max.	Style
MF-USHT035KX	0.35	30	20	0.4	2.2		3.43 (0.135)	2.80 (0.110)	0.85 (0.033)	2
MF-USHT050KX	0.50	30	20	0.3	1.6		3.43 (0.135)	2.80 (0.110)	0.85 (0.033)	2

MF-NSHT Series (1206 package) — 0.16 – 0.35 Amps Hold Current
Surface Mount/High Temperature (Working Temp: -40 °C ~ +125 °C)

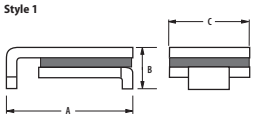
Model	Ihold Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance Ohms at 23 °C Min.	Initial Resistance Ohms at 23 °C Max.	1 Hour (R1) Post-Trip Resistance Ohms at 23 °C	Dimensions mm/(in) A Max.	Dimensions mm/(in) B Max.	Dimensions mm/(in) C Max.	Style
MF-NSHT016KX	0.16	30	80	0.7	6.0		3.40 (0.134)	1.80 (0.071)	0.85 (0.033)	2
MF-NSHT035KX	0.35	30	80	0.4	2.6		3.40 (0.134)	1.80 (0.071)	0.85 (0.033)	2

MF-PSHT Series (0805 package) — 0.35 – 0.50 Amps Hold Current
Surface Mount/High Temperature (Working Temp: -40 °C ~ +125 °C)

Model	Ihold Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance Ohms at 23 °C Min.	Initial Resistance Ohms at 23 °C Max.	1 Hour (R1) Post-Trip Resistance Ohms at 23 °C	Dimensions mm/(in) A Max.	Dimensions mm/(in) B Max.	Dimensions mm/(in) C Max.	Style
MF-PSHT010X	0.10	16	40	1.00	12.00		2.30 (0.091)	1.50 (0.059)	0.80 (0.031)	2

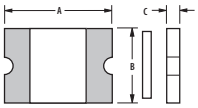
Surface Mount Extra Low Resistance Products

Style 1



Side View End View

Style 2



Top and Bottom View Side View

Features

- Tape & reel packaging
- Industry standard sizes
- freeXpansion™ Design

Applications

- Computers and peripherals
- General electronics
- Battery Protection

MF-USML Series (1210 package) 6 Volts
Surface Mount (3225 mm) 1.75 – 7.00 Amps Hold Current

Model	I_{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance Ohms at 23 °C Min.	Initial Resistance Ohms at 23 °C Max.	1 Hour (R_1) Post-Trip Resistance Ohms at 23 °C Max.	Dimensions mm/(in) A Max.	Dimensions mm/(in) B Max.	Dimensions mm/(in) C Max.	Style
MF-USML175	1.75	6	50	6.0	40.0		3.43 (0.135)	2.80 (0.110)	0.60 (0.024)	2
MF-USML190	1.90	6	50	6.0	30.0		3.43 (0.135)	2.80 (0.110)	0.60 (0.024)	2
MF-USML200	2.00	6	50	5.0	24.0		3.43 (0.135)	2.80 (0.110)	0.60 (0.024)	2
MF-USML230	2.30	6	50	4.5	24.0		3.43 (0.135)	2.80 (0.110)	0.60 (0.024)	2
MF-USML250	2.50	6	50	4.5	22.0		3.43 (0.135)	2.80 (0.110)	0.60 (0.024)	2
MF-USML270	2.70	6	50	4.0	20.0		3.43 (0.135)	2.80 (0.110)	0.60 (0.024)	2
MF-USML300	3.00	6	50	4.0	18.0		3.43 (0.135)	2.80 (0.110)	0.60 (0.024)	2
MF-USML350	3.50	6	50	3.0	18.0		3.43 (0.135)	2.80 (0.110)	0.60 (0.024)	2
MF-USML380	3.80	6	50	2.0	16.0		3.43 (0.135)	2.80 (0.110)	0.60 (0.024)	2
MF-USML400	4.00	6	50	1.5	15.5		3.43 (0.135)	2.80 (0.110)	0.60 (0.024)	2
MF-USML450	4.50	6	50	1.0	15.0		3.0 (0.118)	2.80 (0.110)	1.2 (0.047)	2
MF-USML500	5.00	6	50	1.0	14.5		3.0 (0.118)	2.80 (0.110)	1.20 (0.047)	2
MF-USML600	6.00	6	50	1.0	14.0		3.0 (0.118)	2.80 (0.110)	1.20 (0.047)	2
MF-USML650	6.50	6	50	1.0	14.0		3.0 (0.118)	2.80 (0.110)	1.20 (0.047)	2
MF-USML700	7.00	6	50	1.0	13.5		3.0 (0.118)	2.80 (0.110)	1.20 (0.047)	2

MF-NSML Series (1206 package) 6 Volts
Surface Mount (3216 mm) 1.5 – 5.00 Amps Hold Current

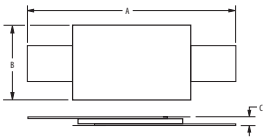
Model	I_{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance Ohms at 23 °C Min.	Initial Resistance Ohms at 23 °C Max.	1 Hour (R_1) Post-Trip Resistance Ohms at 23 °C Max.	Dimensions mm/(in) A Max.	Dimensions mm/(in) B Max.	Dimensions mm/(in) C Max.	Style
MF-NSML150	1.50	6	50	10.0	65.0		3.50 (0.138)	1.80 (0.071)	0.60 (0.024)	2
MF-NSML175	1.75	6	50	5.0	30.0		3.50 (0.138)	1.80 (0.071)	0.60 (0.024)	2
MF-NSML190	1.90	6	50	5.0	28.0		3.50 (0.138)	1.80 (0.071)	0.60 (0.024)	2
MF-NSML200	2.00	6	50	5.0	25.0		3.50 (0.138)	1.80 (0.071)	0.60 (0.024)	2
MF-NSML260	2.60	6	50	3.0	26.0		3.50 (0.138)	1.80 (0.071)	0.60 (0.024)	2
MF-NSML300	3.00	6	50	2.5	20.0		3.50 (0.138)	1.80 (0.071)	0.60 (0.024)	2
MF-NSML350	3.50	6	50	2.0	18.0		3.50 (0.138)	1.80 (0.071)	0.60 (0.024)	2
MF-NSML380	3.80	6	50	1.5	14.0		3.50 (0.138)	1.80 (0.071)	0.60 (0.024)	2
MF-NSML400	4.00	6	50	1.5	14.0		3.50 (0.138)	1.80 (0.071)	0.60 (0.024)	2
MF-NSML450	4.50	6	50	1.0	14.0		3.50 (0.138)	1.80 (0.071)	1.20 (0.047)	2
MF-NSML500	5.00	6	50	1.0	12.0		3.50 (0.138)	1.80 (0.071)	1.20 (0.047)	2

MF-PSML Series (0805 package) 6 Volts
Surface Mount (2010 mm) 1.10 – 3.00 Amps Hold Current

Model	I_{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance Ohms at 23 °C Min.	Initial Resistance Ohms at 23 °C Max.	1 Hour (R_1) Post-Trip Resistance Ohms at 23 °C Max.	Dimensions mm/(in) A Max.	Dimensions mm/(in) B Max.	Dimensions mm/(in) C Max.	Style
MF-PSML110	1.50	6	50	17.5	130.0		2.30 (0.091)	1.50 (0.059)	0.60 (0.024)	2
MF-PSML150	1.75	6	50	15.0	65.0		2.30 (0.091)	1.50 (0.059)	0.60 (0.024)	2
MF-PSML175	1.90	6	50	5.0	55.0		2.30 (0.091)	1.50 (0.059)	0.60 (0.024)	2
MF-PSML200	2.00	6	50	5.0	45.0		2.30 (0.091)	1.50 (0.059)	0.60 (0.024)	2
MF-PSML260	2.60	6	50	3.0	35.0		3.50 (0.138)	1.80 (0.071)	0.80 (0.031)	2
MF-PSML300	3.00	6	50	3.0	30.0		3.50 (0.138)	1.80 (0.071)	0.80 (0.031)	2
MF-PSML350	3.50	6	50	3.0	25.0		3.50 (0.138)	1.80 (0.071)	0.80 (0.031)	2

Strap Products

Standard Style



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 Ohms at 23 °C Min.	Initial Resistance Ohms at 23 °C Max.	1 Hour (R_1) Post-Trip Resistance Ohms at 23 °C	Dimensions mm/(in) A Max.	Dimensions mm/(in) B Max.	Dimensions mm/(in) C Max.	Style
MF-SVS170	1.7	10	100	0.018	0.064		18.0 (0.709)	5.5 (0.216)	0.9 (0.035)	Std.
MF-SVS170N	1.7	10	100	0.018	0.064		24.0 (0.945)	3.9 (0.153)	0.9 (0.035)	Std.
MF-SVS175	1.75	10	100	0.017	0.063		18.0 (0.709)	5.5 (0.216)	0.9 (0.035)	Std.
MF-SVS175N	1.75	10	100	0.017	0.063		24.0 (0.945)	3.9 (0.153)	0.9 (0.035)	Std.
MF-SVS175NL	1.75	10	100	0.017	0.063		28.0 (1.102)	3.9 (0.153)	0.9 (0.035)	Std.
MF-SVS210	2.1	10	100	0.010	0.040		23.1 (0.909)	5.5 (0.216)	0.9 (0.035)	Std.
MF-SVS210N	2.1	10	100	0.010	0.040		32.0 (1.260)	3.9 (0.153)	0.9 (0.035)	Std.
MF-SVS230	2.3	10	100	0.010	0.036		23.1 (0.909)	5.5 (0.216)	0.9 (0.035)	Std.
MF-SVS230N	2.3	10	100	0.010	0.036		32.0 (1.260)	3.9 (0.153)	0.9 (0.035)	Std.

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

Model	I_{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance Ohms at 23 °C Min.	Initial Resistance Ohms at 23 °C Max.	1 Hour (R_1) Post-Trip Resistance Ohms at 23 °C	Dimensions mm/(in) A Max.	Dimensions mm/(in) B Max.	Dimensions mm/(in) C Max.	Style
MF-VS170	1.7	16	100	0.030	0.105		18.0 (0.709)	5.5 (0.217)	0.9 (0.035)	Std.
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 (1.023)	5.5 (0.217)	0.9 (0.035)	Std.

MF-LS Series (Lower Trip Temperature) — 15 – 24 Volts
Axial Leaded Strap — 1.0 – 3.4 Amps Hold Current

Model	I_{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance Ohms at 23 °C Min.	Initial Resistance Ohms at 23 °C Max.	1 Hour (R_1) Post-Trip Resistance Ohms at 23 °C	Dimensions mm/(in) A Max.	Dimensions mm/(in) B Max.	Dimensions mm/(in) C Max.	Style
MF-LS180	1.8	24	100	0.040	0.120		26.0 (1.024)	5.2 (0.205)	1.0 (0.039)	Std.
MF-LS180L	1.8	24	100	0.040	0.120		37.5 (1.48)	5.6 (0.22)	1.0 (0.039)	Std.
MF-LS190	1.9	24	100	0.030	0.100		23.4 (0.921)	11.0 (0.433)	1.1 (0.043)	Std.
MF-LS260	2.6	24	100	0.025	0.076		26.0 (1.024)	11.9 (0.469)	1.0 (0.039)	Std.
MF-LS300	3.0	24	100	0.015	0.055		31.8 (1.252)	13.5 (0.531)	1.1 (0.043)	Std.
MF-LS340	3.4	24	100	0.016	0.050		26.0 (1.024)	15.9 (0.626)	1.0 (0.039)	Std.

MF-VS Narrow Body 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 Ohms at 23 °C Min.	Initial Resistance Ohms at 23 °C Max.	1 Hour (R_1) Post-Trip Resistance Ohms at 23 °C	Dimensions mm/(in) A Max.	Dimensions mm/(in) B Max.	Dimensions mm/(in) C Max.	Style
MF-VS170N	1.7	12	100	0.030	0.105		24.0 (0.945)	3.9 (0.154)	0.9 (0.035)	Std.
MF-VS175NL	1.75	12	100	0.029	0.102		28.0 (1.102)	3.9 (0.154)	0.9 (0.035)	Std.
MF-VS210N	2.1	12	100	0.018	0.060		32.0 (1.260)	3.9 (0.154)	0.9 (0.035)	Std.

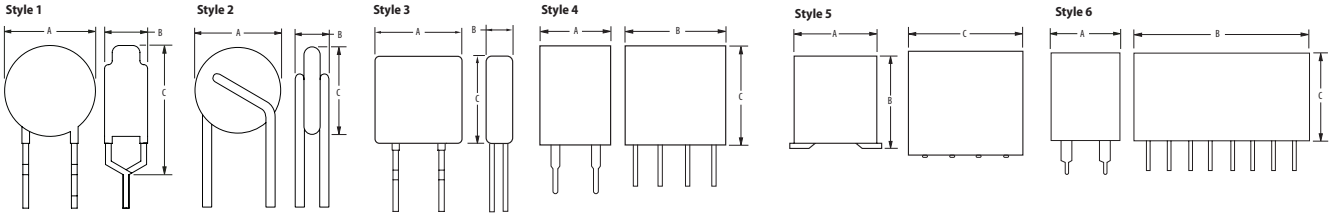
MF-LR Series (Low Resistance) — 10 – 20 Volts
Axial Leaded Strap — 1.90 – 9.00 Amps Hold Current

Model	I_{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance Ohms at 23 °C Min.	Initial Resistance Ohms at 23 °C Max.	1 Hour (R_1) Post-Trip Resistance Ohms at 23 °C	Dimensions mm/(in) A Max.	Dimensions mm/(in) B Max.	Dimensions mm/(in) C Max.	Style
MF-LR190	1.90	15	100	0.039	0.102		22.1 (0.870)	5.2 (0.205)	1.0 (0.039)	Std.
MF-LR260	2.60	15	100	0.020	0.083		23.1 (0.909)	5.2 (0.205)	1.0 (0.039)	Std.
MF-LR380	3.80	15	100	0.013	0.037		26.0 (1.024)	7.5 (0.295)	1.0 (0.039)	Std.
MF-LR450	4.50	16	100	0.011	0.028		26.0 (1.024)	10.5 (0.414)	1.0 (0.039)	Std.
MF-LR550	5.50	10	100	0.009	0.022		37.0 (1.457)	7.5 (0.295)	1.0 (0.039)	Std.
MF-LR550/20	5.50	10	100	0.009	0.022		37.0 (1.457)	7.5 (0.295)	1.0 (0.039)	Std.
MF-LR600	6.00	10	100	0.007	0.019		26.0 (1.024)	15.9 (0.626)	1.0 (0.039)	Std.
MF-LR730	7.30	10	100	0.006	0.015		30 (1.18)	15 (0.590)	1.0 (0.039)	Std.
MF-LR730/20	7.30	20	100	0.006	0.015		29.1 (1.146)	14.5 (0.571)	1.0 (0.039)	Std.
MF-LR900/20	9.00	20	100	0.006	0.014		47.6 (1.874)	8.5 (0.335)	1.3 (0.051)	Std.

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

Model	I_{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance Ohms at 23 °C Min.	Initial Resistance Ohms at 23 °C Max.	1 Hour (R_1) Post-Trip Resistance Ohms at 23 °C	Dimensions mm/(in) A Max.	Dimensions mm/(in) B Max.	Dimensions mm/(in) C Max.	Style
MF-S120	1.20	15	100	0.085	0.220		22.1 (0.870)	5.2 (0.205)	1.0 (0.039)	Std.
MF-S150	1.50	15	100	0.050	0.113		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-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.

Ceramic PTC Products



Features

- Ceramic PTCs for telecom overcurrent protection
- Wide range of form factors for most applications
- Aids telecom compliance with:
  - ITU-T K.20/21/45
  - Telcordia GR-1089-CORE
  - UL 60950, 3rd Edition
- Narrow and matched resistance tolerances

Applications

Used as secondary overcurrent protection devices in:

- Customer Premise Equipment (CPE)
- Central Office Equipment (CO)
- Access equipment

CMF-RL Series
Radial Leaded

230 Volts
±0.5 Ohms Packaging Resistance Matching

Model	Induction Voltage Withstand VAC	Rated Resistance (RN)		Hold Current Amps at 25 °C	Trip Current Amps at 25 °C	Dimensions mm/(in)			Style
		Ohms	Tolerance			A Max.	B Max.	C Nom.	
CMF-RL10	650	10	±20 %	0.14	0.3	9.5 (0.374)	4.5 (0.177)	13.5 (0.531)	1
CMF-RL10-10	650	10	±10 %	0.14	0.3	9.5 (0.374)	4.5 (0.177)	13.5 (0.531)	1
CMF-RL25U	650	35	±20 %	0.060	0.15	5.2 (0.205)	3.5 (0.138)	5.2 (0.205)	2
CMF-RL35	650	35	±20 %	0.075	0.15	9.8 (0.386)	5.0 (0.197)	13.5 (0.531)	1
CMF-RL35-10	650	35	±10 %	0.075	0.15	9.8 (0.386)	5.0 (0.197)	13.5 (0.531)	1
CMF-RL35A	650	35	±10 %	0.075	0.15	7.5 (0.295)	5.6 (0.220)	13.0 (0.512)	1
CMF-RL35A-10	650	35	±10 %	0.075	0.15	7.5 (0.295)	5.6 (0.220)	13.0 (0.512)	1
CMF-RL50	650	50	±20 %	0.065	0.15	9.8 (0.386)	5.0 (0.197)	13.5 (0.531)	1
CMF-RL50-10	650	50	±10 %	0.065	0.15	9.8 (0.386)	5.0 (0.197)	13.5 (0.531)	1
CMF-RL50A	650	50	±20 %	0.05	0.10	7.5 (0.295)	5.6 (0.220)	13.0 (0.512)	1
CMF-RL50A-10	650	50	±10 %	0.05	0.10	7.5 (0.295)	5.6 (0.220)	13.0 (0.512)	1
CMF-RL55	650	55	±20 %	0.065	0.15	9.8 (0.386)	5.0 (0.197)	13.5 (0.531)	1
CMF-RL55-10	650	55	±10 %	0.065	0.15	9.8 (0.386)	5.0 (0.197)	13.5 (0.531)	1
CMF-RL55A	650	55	±20 %	0.05	0.10	7.5 (0.295)	5.6 (0.220)	13.0 (0.512)	1
CMF-RL55A-10	650	55	±10 %	0.05	0.10	7.5 (0.295)	5.6 (0.220)	13.0 (0.512)	1

CMF-RLC Series
Through-hole/Ceramic Case

Ceramic Housing
±0.5 Ohms Packaging
Resistance Matching

Model	Induction Voltage Withstand VAC	Rated Resistance (RN)		Hold Current Amps at 25 °C	Trip Current Amps at 25 °C	Dimensions mm/(in)			Style
		Ohms	Tolerance			A Max.	B Max.	C Nom.	
CMF-RLC50	650	50	±20 %	0.065	0.15	9.2 (0.362)	4.7 (0.185)	9.6 (0.378)	3
CMF-RLC50-10	650	50	±10 %	0.065	0.15	9.2 (0.362)	4.7 (0.185)	9.6 (0.378)	3

CMF-SD Series
Twin Pack/SMD

230 V Rated
±0.5 Ohms Resistance
Matching in Housing

Model	Induction Voltage Withstand VAC	Rated Resistance (RN)		Hold Current Amps at 25 °C	Trip Current Amps at 25 °C	Dimensions mm/(in)			Style
		Ohms	Tolerance			A Max.	B Max.	C Nom.	
CMF-SD25	600	25	±20 %	0.13	0.26	9.0 (0.354)	10.8 (0.425)	10.2 (0.402)	5
CMF-SD25-10	600	25	±10 %	0.13	0.26	9.0 (0.354)	10.8 (0.425)	10.2 (0.402)	5
CMF-SD25A	600	25	±20 %	0.13	0.26	7.15 (0.281)	8.5 (0.335)	8.1 (0.319)	5
CMF-SD25A-10	600	25	±10 %	0.13	0.26	7.15 (0.281)	8.5 (0.335)	8.1 (0.319)	5
CMF-SD35	600	35	±20 %	0.10	0.20	9.0 (0.354)	10.8 (0.425)	10.2 (0.402)	5
CMF-SD35-10	600	35	±10 %	0.10	0.20	9.0 (0.354)	10.8 (0.425)	10.2 (0.402)	5
CMF-SD35A	600	35	±20 %	0.10	0.20	7.15 (0.281)	8.5 (0.335)	8.1 (0.319)	5
CMF-SD35A-10	600	35	±10 %	0.10	0.20	7.15 (0.281)	8.5 (0.335)	8.1 (0.319)	5
CMF-SD50	600	50	±20 %	0.09	0.19	9.0 (0.354)	10.8 (0.425)	10.2 (0.402)	5
CMF-SD50-10	600	50	±10 %	0.09	0.19	9.0 (0.354)	10.8 (0.425)	10.2 (0.402)	5
CMF-SD50A	600	50	±20 %	0.09	0.19	7.15 (0.281)	8.5 (0.335)	8.1 (0.319)	5
CMF-SD50A-10	600	50	±10 %	0.09	0.19	7.15 (0.281)	8.5 (0.335)	8.1 (0.319)	5

CMF-RD Series
Twin Pack/Through-hole

230 Volts
±0.5 Ohms Packaging
Resistance Matching

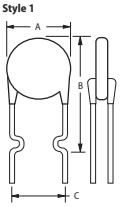
Model	Induction Voltage Withstand VAC	Rated Resistance (RN)		Hold Current Amps at 25 °C	Trip Current Amps at 25 °C	Dimensions mm/(in)			Style
		Ohms	Tolerance			A Max.	B Max.	C Nom.	
CMF-RD50	600	50	±20 %	0.09	0.19	9.0 (0.354)	10.2 (0.402)	9.5 (0.446)	4
CMF-RD50-10	600	50	±10 %	0.09	0.19	9.0 (0.354)	10.2 (0.402)	9.5 (0.446)	4

CMF-RQ Series
Quad Pack/Through-hole

Four CPTCs in One Package
±0.5 Ohms Resistance
Matching in Housing

Model	Induction Voltage Withstand VAC	Rated Resistance (RN)		Hold Current Amps at 25 °C	Trip Current Amps at 25 °C	Dimensions mm/(in)			Style
		Ohms	Tolerance			A Max.	B Max.	C Nom.	
CMF-RQ50	600	50	±20 %	0.09	0.19	10.0 (0.393)	21.0 (0.826)	11.0 (0.433)	6
CMF-RQ50-10	600	50	±10 %	0.09	0.19	10.0 (0.393)	21.0 (0.826)	11.0 (0.433)	6

Style 1



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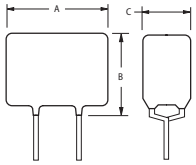

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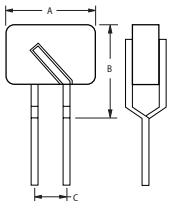

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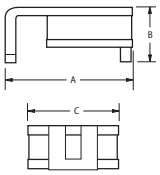

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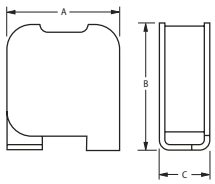

Features

- Designed to withstand lightning surge
- Designed to withstand AC power cross
- Available in matched resistance "bins"

Applications

- CPE and central office
- Access equipment
- Hybrid-fiber coax

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 Ohms at 23 °C Min.	Initial Resistance Ohms at 23 °C Max.	1 Hour (R_1) Post-Trip Resistance Ohms at 23 °C Max.	Dimensions mm/(in) A Max.	Dimensions mm/(in) B Max.	Dimensions mm/(in) C Nom.	Style
MF-R055/90	0.55	90	10	0.45	2.0	10.9 (0.43)	16.7 (0.65)	5.1 (0.201)		1
MF-R055/90U	0.55	90	10	0.45	2.0	10.3 (0.4)	16.7 (0.65)	5.1 (0.201)		1
MF-R075/90	0.75	90	10	0.37	1.65	11.9 (0.47)	15.5 (0.61)	5.1 (0.201)		1

MF-RX/250 Series
(Fast Trip, Small Package)
Radial Leaded

60 Volts
250 V_{rms} short duration interrupt
0.12 – 0.18 Amps Hold Current

Model	I_{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance Ohms at 23 °C Min.	Initial Resistance Ohms at 23 °C Max.	1 Hour (R_1) Post-Trip Resistance Ohms at 23 °C Max.	Dimensions mm/(in) A Max.	Dimensions mm/(in) B Max.	Dimensions mm/(in) C Max.	Style
MF-RX012/250	0.12	60	3.0	4.0	16.0	6.5 (0.256)	11.0 (0.433)	5.1 (0.201)		2
MF-RX012/250-A	0.12	60	3.0	7.0	16.0	6.5 (0.256)	11.0 (0.433)	5.1 (0.201)		2
MF-RX012/250-C	0.12	60	3.0	5.5	14.0	6.5 (0.256)	11.0 (0.433)	5.1 (0.201)		2
MF-RX012/250-F	0.12	60	3.0	6.0	16.0	6.5 (0.256)	11.0 (0.433)	5.1 (0.201)		2
MF-RX012/250-1	0.12	60	3.0	6.0	16.0	6.5 (0.256)	11.0 (0.433)	5.1 (0.201)		2
MF-RX012/250-2	0.12	60	3.0	8.0	16.0	6.5 (0.256)	11.0 (0.433)	5.1 (0.201)		2
MF-RX012/250-T	0.12	60	3.0	7.0	16.0	6.5 (0.256)	11.0 (0.433)	5.1 (0.201)		2
MF-RX012/250U	0.12	60	3.0	6.0	16.0	6.0 (0.236)	10.0 (0.394)	5.1 (0.201)		3
MF-RX014/250	0.145	60	3.0	3.0	14.0	6.5 (0.256)	11.0 (0.433)	5.1 (0.201)		2
MF-RX014/250-A	0.145	60	3.0	3.0	12.0	6.5 (0.256)	11.0 (0.433)	5.1 (0.201)		2
MF-RX014/250-B	0.145	60	3.0	4.5	14.0	6.5 (0.256)	11.0 (0.433)	5.1 (0.201)		2
MF-RX014/250-T	0.145	60	3.0	5.4	14.0	6.5 (0.256)	11.0 (0.433)	5.1 (0.201)		2
MF-RX014/250U	0.145	60	3.0	3.5	12.0	6.0 (0.236)	10.0 (0.394)	5.1 (0.201)		3
MF-RX018/250	0.18	60	10.0	0.8	4.0	11.0 (0.433)	13.6 (0.535)	5.1 (0.201)		2
MF-RX018/250U	0.18	60	10.0	0.8	4.0	10.4 (0.409)	12.6 (0.496)	5.1 (0.201)		3

MF-R/600 Series
Radial Leaded

60 Volts
600 V_{rms} short duration interrupt
0.15 – 0.16 Amps Hold Current

Model	I_{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance Ohms at 23 °C Min.	Initial Resistance Ohms at 23 °C Max.	1 Hour (R_1) Post-Trip Resistance Ohms at 23 °C Max.	Dimensions mm/(in) A Max.	Dimensions mm/(in) B Max.	Dimensions mm/(in) C Max.	Style
MF-R015/600	0.15	60	3.0	6.0	22.0	13.5 (0.531)	12.6 (0.496)	6.0 (0.236)		2
MF-R015/600-A	0.15	60	3.0	7.0	20.0	13.5 (0.531)	12.6 (0.496)	6.0 (0.236)		2
MF-R015/600-B	0.15	60	3.0	9.0	22.0	13.5 (0.531)	12.6 (0.496)	6.0 (0.236)		2
MF-R015/600-F	0.15	60	3.0	7.0	22.0	13.5 (0.531)	12.6 (0.496)	6.0 (0.236)		2
MF-R016/600	0.16	60	3.0	4.0	18.0	16.0 (0.629)	12.6 (0.496)	6.0 (0.236)		2
MF-R016/600-A	0.16	60	3.0	4.0	16.0	16.0 (0.629)	12.6 (0.496)	6.0 (0.236)		2
MF-R016/600-1	0.16	60	3.0	4.0	17.0	16.0 (0.629)	12.6 (0.496)	6.0 (0.236)		2

MF-SM013/250 Series
Surface Mount

60 Volts
250 V_{rms} short duration interrupt
0.13 Amps Hold Current

Model	I_{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance Ohms at 23 °C Min.	Initial Resistance Ohms at 23 °C Max.	1 Hour (R_1) Post-Trip Resistance Ohms at 23 °C Max.	Dimensions mm/(in) A Max.	Dimensions mm/(in) B Max.	Dimensions mm/(in) C Max.	Style
MF-SM013/250-2	0.13	60	3.0	6.5	20.0	9.4 (0.370)	3.7 (0.146)	7.4 (0.291)		4
MF-SM013/250-A-2	0.13	60	3.0	6.5	20.0	9.4 (0.370)	3.7 (0.146)	7.4 (0.291)		4
MF-SM013/250-B-2	0.13	60	3.0	9.0	20.0	9.4 (0.370)	3.7 (0.146)	7.4 (0.291)		4
MF-SM013/250-C-2	0.13	60	3.0	7.0	20.0	9.4 (0.370)	3.7 (0.146)	7.4 (0.291)		4

MF-SM013/250V Series
Surface Mount

60 Volts
250 V_{rms} short duration interrupt
0.13 Amps Hold Current

Model	I_{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance Ohms at 23 °C Min.	Initial Resistance Ohms at 23 °C Max.	1 Hour (R_1) Post-Trip Resistance Ohms at 23 °C Max.	Dimensions mm/(in) A Max.	Dimensions mm/(in) B Max.	Dimensions mm/(in) C Max.	Style
MF-SM013/250V	0.13	250	3.0	6.5	20.0	6.6 (0.260)	7.4 (0.291)	3.2 (0.126)		5

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