

Bourns® Multifuse® Resettable Fuses

Polymeric PTC & Ceramic PTC Short Form Brochure



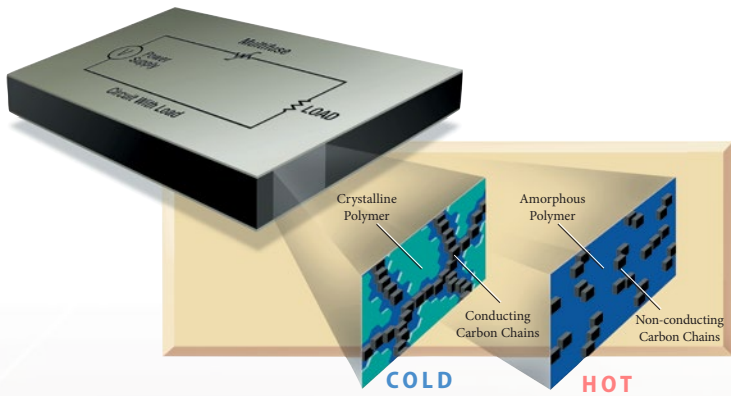
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Bourns® Multifuse® Products

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.

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 NumberCA 110338
-  TÜV File NumberR2057213

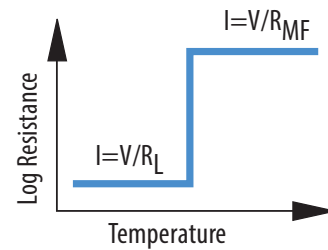
Features/Benefits

- 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

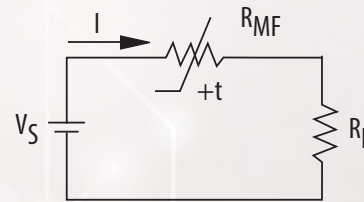
- Computer
- Battery
- Automotive
- Telecommunications
- Industrial
- Consumer

Multifuse® Products – How They 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
 ASML = Surface Mount (0402)
 FSMF = Surface Mount (0603)
 FSML = 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)*

S = Slotted Lead Option (one side)*

SS = Slotted Lead Option (two sides)*

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

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})

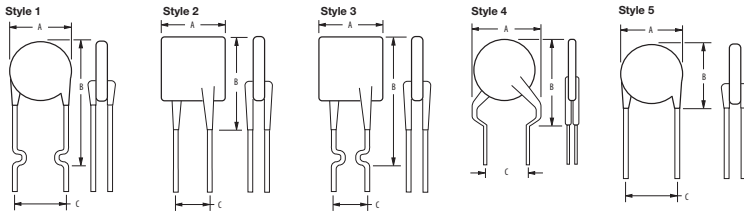
The maximum voltage a PPTC device can withstand without damage at the rated current.

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		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	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

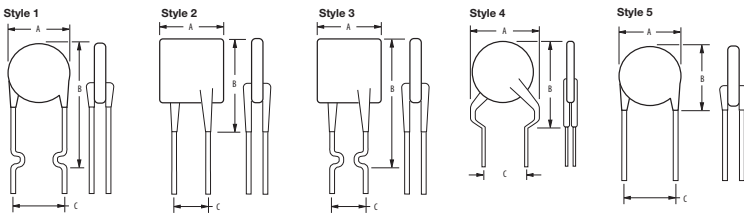
Model	I _{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance		Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Nom.	
				Min.	Max.				
MF-RG300	3.0	16	100	38	64.5	7.1 (0.28)	11.0 (0.443)	5.1 ± 0.7 (0.201 ± 0.028)	2
MF-RG400	4.0	16	100	21	38.5	8.9 (0.35)	12.8 (0.443)	5.1 ± 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		Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Nom.	
				Min.	Max.				
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		Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Nom.	
				Min.	Max.				
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		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

*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		Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Nom.	
				Min.	Max.				
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

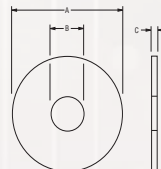
Disc & Chip Type PTC Products

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		Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Max.	
				Min.	Max.				
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



Features

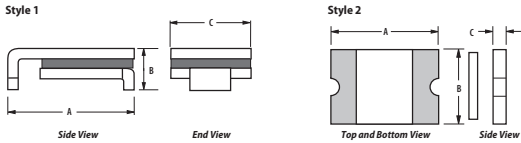
- Custom designs to meet appropriate applications
- Compatible with current industry standards
- Overcurrent and overtemperature protection
- Standard and low temperature material
- Patents pending

Applications

- Lithium cells
- Battery cells
- Powered toys
- Motors

*For ordering information, contact your Bourns representative.

Surface Mount Low Voltage Products



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		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)	3.0 (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-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		Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Max.	
				Min.	Max.				
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

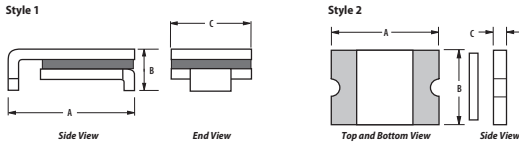
MF-SM Series (2920 package) 6-60 Volts Surface Mount (7555 mm) 0.30 - 3.00 Amps Hold Current

Model	I _{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance		Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Nom.	
				Min.	Max.				
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		Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Max.	
				Min.	Max.				
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

Surface Mount Low Voltage Products



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		1 Hour (R ₁) Post-Trip Resistance		Dimensions mm/(in)			Style
				Ohms at 23 °C				A Max.	B Max.	C Max.	
				Min.	Max.	Min.	Max.				
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		1 Hour (R ₁) Post-Trip Resistance		Dimensions mm/(in)			Style
				Ohms at 23 °C				A Max.	B Max.	C Max.	
				Min.	Max.	Min.	Max.				
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		1 Hour (R ₁) Post-Trip Resistance		Dimensions mm/(in)			Style
				Ohms at 23 °C				A Max.	B Max.	C Max.	
				Min.	Max.	Min.	Max.				
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

Features

- Tape & reel packaging
- Industry standard sizes

Applications

- Computers and peripherals
- General electronics
- Automotive

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		1 Hour (R ₁) Post-Trip Resistance		Dimensions mm/(in)			Style
				Ohms at 23 °C				A Max.	B Max.	C Max.	
				Min.	Max.	Min.	Max.				
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		1 Hour (R ₁) Post-Trip Resistance		Dimensions mm/(in)			Style
				Ohms at 23 °C				A Max.	B Max.	C Max.	
				Min.	Max.	Min.	Max.				
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	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.	Min.	Max.				
MF-USHT035KX	0.35	30	80	0.4	2.2	3.43 (0.135)	2.80 (0.110)	0.85 (0.033)			2
MF-USHT050KX	0.50	30	80	0.3	1.6	3.43 (0.135)	2.80 (0.110)	0.85 (0.033)			2

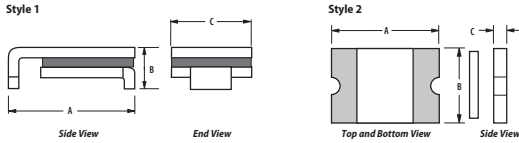
MF-NSHT Series (1206 package) 0.16 – 0.35 Amps Hold Current Surface Mount/High Temperature (Working Temp: -40 °C ~ +125 °C)

Model	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.	Min.	Max.				
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	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.	Min.	Max.				
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



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		Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Max.	
				Min.	Max.				
MF-USML175	1.75	6	50	0.0060	0.0400	3.43 (0.135)	2.80 (0.110)	0.60 (0.024)	2
MF-USML190	1.90	6	50	0.0060	0.0300	3.43 (0.135)	2.80 (0.110)	0.60 (0.024)	2
MF-USML200	2.00	6	50	0.0050	0.0300	3.43 (0.135)	2.80 (0.110)	0.60 (0.024)	2
MF-USML230	2.30	6	50	0.0045	0.0240	3.43 (0.135)	2.80 (0.110)	0.60 (0.024)	2
MF-USML250	2.50	6	50	0.0045	0.0220	3.43 (0.135)	2.80 (0.110)	0.60 (0.024)	2
MF-USML270	2.70	6	50	0.0040	0.0200	3.43 (0.135)	2.80 (0.110)	0.60 (0.024)	2
MF-USML300	3.00	6	50	0.0040	0.0180	3.43 (0.135)	2.80 (0.110)	0.60 (0.024)	2
MF-USML350	3.50	6	50	0.0030	0.0180	3.43 (0.135)	2.80 (0.110)	0.60 (0.024)	2
MF-USML380	3.80	6	50	0.0020	0.0160	3.43 (0.135)	2.80 (0.110)	0.60 (0.024)	2
MF-USML400	4.00	6	50	0.0015	0.0155	3.43 (0.135)	2.80 (0.110)	0.60 (0.024)	2
MF-USML450	4.50	6	50	0.0010	0.0150	3.0 (0.118)	2.80 (0.110)	1.2 (0.047)	2
MF-USML500	5.00	6	50	0.0010	0.0145	3.0 (0.118)	2.80 (0.110)	1.20 (0.047)	2
MF-USML600	6.00	6	50	0.0010	0.0140	3.0 (0.118)	2.80 (0.110)	1.20 (0.047)	2
MF-USML650	6.50	6	50	0.0010	0.0140	3.0 (0.118)	2.80 (0.110)	1.20 (0.047)	2
MF-USML700	7.00	6	50	0.0010	0.0135	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		Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Max.	
				Min.	Max.				
MF-NSML150	1.50	6	50	0.0100	0.0650	3.50 (0.138)	1.80 (0.071)	0.60 (0.024)	2
MF-NSML175	1.75	6	50	0.0050	0.0400	3.50 (0.138)	1.80 (0.071)	0.60 (0.024)	2
MF-NSML190	1.90	6	50	0.0050	0.0300	3.50 (0.138)	1.80 (0.071)	0.60 (0.024)	2
MF-NSML200	2.00	6	50	0.0050	0.0300	3.50 (0.138)	1.80 (0.071)	0.60 (0.024)	2
MF-NSML260	2.60	6	50	0.0030	0.0260	3.50 (0.138)	1.80 (0.071)	0.60 (0.024)	2
MF-NSML300	3.00	6	50	0.0025	0.0200	3.50 (0.138)	1.80 (0.071)	0.60 (0.024)	2
MF-NSML350	3.50	6	50	0.0020	0.0180	3.50 (0.138)	1.80 (0.071)	0.60 (0.024)	2
MF-NSML380	3.80	6	50	0.0015	0.0140	3.50 (0.138)	1.80 (0.071)	0.60 (0.024)	2
MF-NSML400	4.00	6	50	0.0015	0.0140	3.50 (0.138)	1.80 (0.071)	0.60 (0.024)	2
MF-NSML450	4.50	6	50	0.0010	0.0140	3.50 (0.138)	1.80 (0.071)	1.20 (0.047)	2
MF-NSML500	5.00	6	50	0.0010	0.0120	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		Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Max.	
				Min.	Max.				
MF-PSML110	1.50	6	50	0.0175	0.130	2.30 (0.091)	1.50 (0.059)	0.60 (0.024)	2
MF-PSML150	1.75	6	50	0.015	0.065	2.30 (0.091)	1.50 (0.059)	0.60 (0.024)	2
MF-PSML175	1.90	6	50	0.005	0.055	2.30 (0.091)	1.50 (0.059)	0.60 (0.024)	2
MF-PSML200	2.00	6	50	0.005	0.045	2.30 (0.091)	1.50 (0.059)	0.60 (0.024)	2
MF-PSML260	2.60	6	50	0.003	0.035	3.50 (0.138)	1.80 (0.071)	0.80 (0.031)	2
MF-PSML300	3.00	6	50	0.003	0.030	3.50 (0.138)	1.80 (0.071)	0.80 (0.031)	2
MF-PSML350	3.50	6	50	0.003	0.025	3.50 (0.138)	1.80 (0.071)	0.80 (0.031)	2

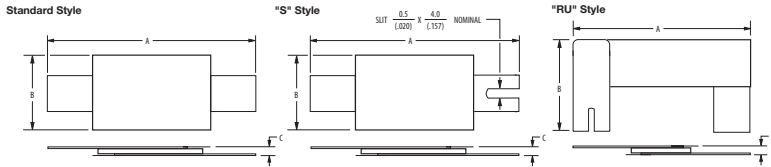
MF-FSML Series (0603 package) 6 – 30 Volts Surface Mount (1608 mm) 0.50 – 1.75 Amps Hold Current

Model	I _{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance		Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Max.	
				Min.	Max.				
MF-FSML050	0.50	8	50	0.060	0.500	1.85 (0.073)	1.05 (0.041)	0.60 (0.020)	2
MF-FSML075	0.75	8	50	0.050	0.0250	1.85 (0.073)	1.05 (0.041)	0.60 (0.020)	2
MF-FSML100	1.0	8	50	0.040	0.0220	1.85 (0.073)	1.05 (0.041)	0.60 (0.020)	2
MF-FSML125	1.25	8	50	0.020	0.180	1.85 (0.073)	1.05 (0.041)	0.60 (0.020)	2
MF-FSML150	1.50	8	50	0.010	0.120	1.85 (0.073)	1.05 (0.041)	0.60 (0.020)	2
MF-FSML175	1.75	8	50	0.008	0.070	1.85 (0.073)	1.05 (0.041)	0.60 (0.020)	2

MF-ASML Series (0402 package) 6 Volts Surface Mount (1005 mm) 0.50 – 1.75 Amps Hold Current

Model	I _{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance		Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Max.	
				Min.	Max.				
MF-ASML010	0.10	6.0	50	0.150	0.20	1.15 (0.05)	0.65 (0.03)	0.60 (0.020)	2
MF-ASML020	0.20	6.0	50	0.01	1.25	1.15 (0.05)	0.65 (0.03)	0.60 (0.020)	2
MF-ASML035	0.35	6.0	50	0.05	0.85	1.15 (0.05)	0.65 (0.03)	0.60 (0.020)	2
MF-ASML050	0.50	6.0	50	0.04	0.50	1.15 (0.05)	0.65 (0.03)	0.60 (0.020)	2
MF-ASML075	0.75	6.0	50	0.025	0.25	1.15 (0.05)	0.65 (0.03)	0.60 (0.020)	2

Strap Products



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		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	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		Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Max.	
				Min.	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 (1.023)	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-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		Dimensions mm/(in)			Style
				Ohms at 23 °C		A Max.	B Max.	C Max.	
				Min.	Max.				
MF-LS100S	1.0	24	100	0.070	0.260	23.1 (0.909)	5.2 (0.205)	1.0 (0.039)	S
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-LS180S	1.8	24	100	0.040	0.120	26.0 (1.024)	5.2 (0.205)	1.0 (0.039)	S
MF-LS190	1.9	24	100	0.030	0.100	23.4 (0.921)	11.0 (0.433)	1.1 (0.043)	Std.
MF-LS190RU	1.9	15	100	0.030	0.100	20.8 (0.819)	14.3 (0.563)	0.76 (0.030)	RU
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.

Features

- Axial/Radial leaded
- Weldable nickel terminal
- Very low internal resistance

Applications

- Rechargeable battery packs for cellular phones & laptop computers

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		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	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.

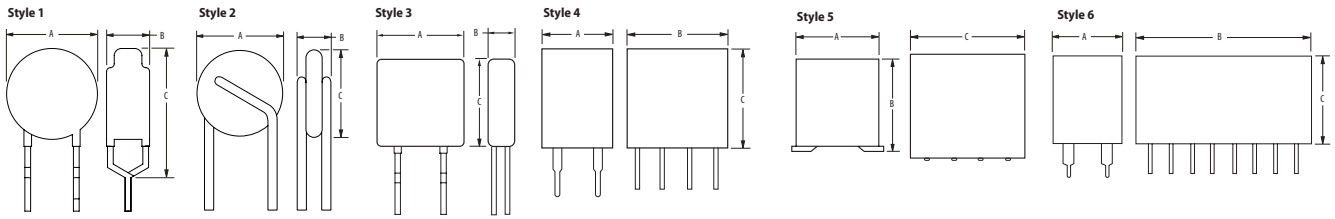
MF-LR Series (Low Resistance) 10 – 20 Volts Axial Leaded Strap 1.90 – 9.00 Amps Hold Current

Model	I _{hold} Amperes at 23 °C	V max. Volts	I max. Amps	Initial Resistance		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	22.1 (0.870)	5.2 (0.205)	1.0 (0.039)	Std.
MF-LR190S	1.90	15	100	0.039	0.102	22.1 (0.870)	5.2 (0.205)	1.0 (0.039)	S
MF-LR260	2.60	15	100	0.020	0.083	23.1 (0.909)	5.2 (0.205)	1.0 (0.039)	Std.
MF-LR260S	2.60	15	100	0.020	0.083	23.1 (0.909)	5.2 (0.205)	1.0 (0.039)	S
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		Dimensions mm/(in)			Style
				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	0.113	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-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.

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

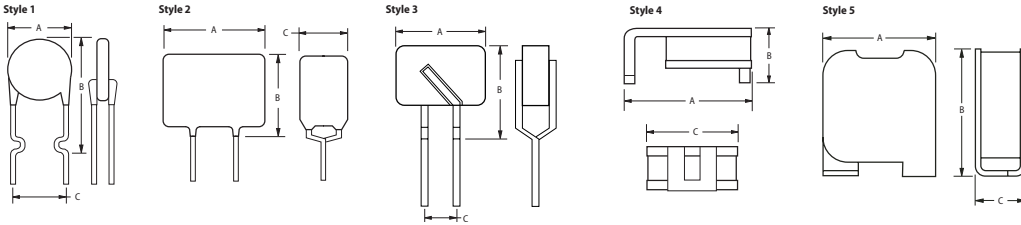
Four CPTCs in One Package

±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

Telecom Products



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 90 Volts Radial Leaded 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	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 60 Volts (Fast Trip, Small Package) 250 V_{rms} 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 Max.	
				Min.	Max.							
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 60 Volts Radial Leaded 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		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	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 60 Volts Surface Mount 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		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)	3.7 (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 60 Volts Surface Mount 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		1 Hour (R ₁) Post-Trip Resistance			Dimensions mm/(in)			Style
				Ohms at 23 °C					A Max.	B Max.	C Max.	
				Min.	Max.							
MF-SM013/250V	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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