PPTC Resettable Fuse

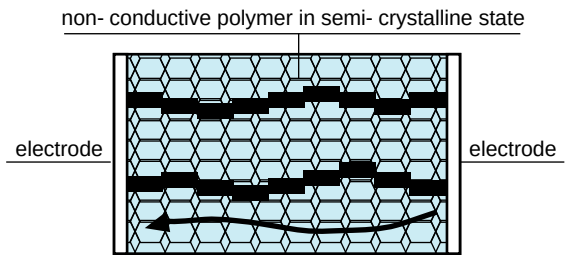
Principles of PPTC Resettable Fuse

A Polymer Positive Temperature Coefficient (PPTC) fuse is an overcurrent protection device that trips when a certain trip cur rent is exceeded. In contrast with conventional fuses that need to be replaced, resettable fuses automatically reset once the overcurrent is removed. They are small, inexpensive and come in a variety of packages :Radial leaded, Axial leaded or Surface Mount.

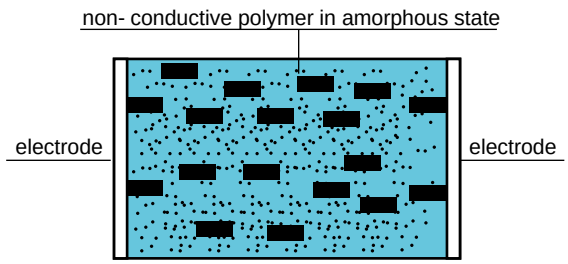
PPTC Resettable fuse are constructed with a nonconductive polymer plastic film that exhibits two phases. The first phase is a crystalline or semi-crystalline state where the molecules form long chains and are arranged in a regular structure. As the temperature increases, the polymer maintains this struc ture ,but eventually transition to an amorphous phase where the molecules are aligned randomly and there is an increase in volume.The polymer is combined with highly conductive carbon. In the crystalline phase, the carbon particles are packed into the crystalline boundaries and form many conduc tive paths. The polymer-carbon combination has a low resist ance.

A current flowing through the device generate heat(I^2R loss es). As long as the temperature increase does not cause a phase change, nothing happens. However, if the current in crease enough so that corresponding temperature rise causes a phase change,the polymer's crystalline structure disap pears,the volume expands,and the conducting carbon chains are broken. The result is a dramatic increase in resistance. Whereas a polymer-carbon combination may have a resist ance measured in milliohms or ohms before the phase change, after the phase change the same structure's resist ance may be measured in megaohms. Current flow is reduced accordingly, but the small residual current and the associated I^2R loss is enough to latch the polymer in this state ,and the fuse will stay open until power is removed.

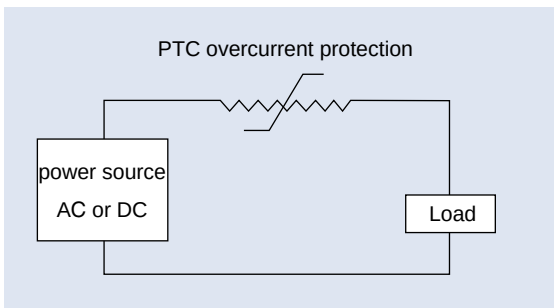
The process is almost reversible in that, when the temperature falls,the polymer returns to its crystalline structure, the volume decreases, and the carbon particles touch and form conduc tive paths. The resistance quickly returns to its original value.



conducting chain of carbon molecules



broken chain of carbon molecules



Typical PTC application

Products Selection Guide:

Sept 1. Select the resettable fuse considering maximum ambient temperature and normal operating current of the protected circuit.

Sept 2. Compare the resettable fuse rated voltage and maximum fault (interrupt) current with the electrical circuit data to ensure that these parameters do not exceed it's ratings.

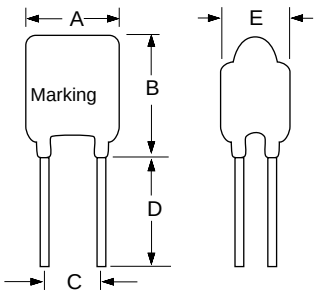
Sept 3. Check the resettable fuse's trip time to be sure it will protect the electrical circuit in accordance with time and overcurrent requirement.

Step 4. Verify that the ambient temperature in the circuit is within the resettable fuse'operating temperature range.(Using the Thermal Derating Chart-I_{hold})

Step 5. Verify that the resettable fuse dimensions and types (Radial leaded,Axial leaded or surface Mount) fit the space requirements in the application.

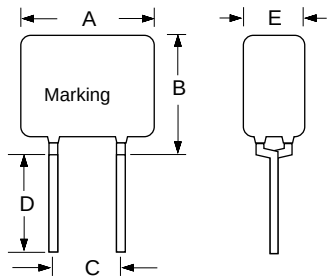
Step 6. Independently evaluate and test the suitability and performance of the Resettable fuse in the application.

Physical Description for Dimensions

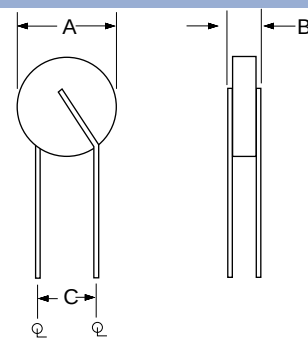


(SF) Figure 1

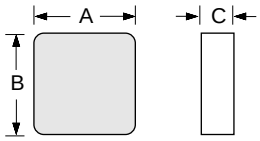
Lead Dia: 0. 5mm



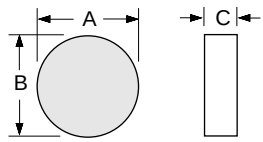
(SF) Figure 2



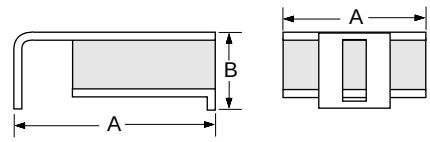
(SF) Figure 3



(SN) Figure 4



(SN) Figure 5



(SD) Figure 6

Electrical characteristics25℃

part number	I_h	I_t	Max. Operating Voltage	I_{max}	Max. Interrupt	Initial Resistance R_{min}	R_{max}
	(amps)	(amps)	(volts)	(amps)	(volts)	(Ohms)	(Ohms)
SN250- 080	0. 080	0. 160	60	3	250	14. 00	20. 00
SN250- 100	0. 100	0. 200	60	3	250	10. 00	16. 00
SN250- 110	0. 110	0. 220	60	3	250	8. 00	14. 00
SN250- 120	0. 120	0. 240	60	3	250	6. 00	12. 00
SN250- 130	0. 130	0. 260	60	3	250	4. 00	10. 00
SN250- 145	0. 145	0. 290	60	3	250	3. 00	8. 00
SN250- 160	0. 160	0. 320	60	3	250	2. 00	6. 00
SN250- 180	0. 180	0. 360	60	10	250	0. 80	2. 00
SN600- 150	0. 150	0. 300	60	3	600	6. 00	12. 00
SN600- 160	0. 160	0. 320	60	3	600	4. 00	10. 00
SF250- 080	0. 080	0. 160	60	3	250	14. 00	20. 00
SF250- 100	0. 100	0. 200	60	3	250	10. 00	16. 00
SF250- 110	0. 110	0. 220	60	3	250	8. 00	14. 00
SF250- 120	0. 120	0. 240	60	3	250	6. 00	12. 00
SF250- 120(U) *	0. 120	0. 240	60	3	250	6. 00	12. 00
SF250- 130	0. 130	0. 260	60	3	250	4. 00	10. 00
SF250- 145	0. 145	0. 290	60	3	250	3. 00	8. 00
SF250- 160	0. 160	0. 320	60	3	250	2. 00	6. 00
SF250- 180	0. 180	0. 360	60	10	250	0. 80	2. 00
SF250- 180(U) *	0. 180	0. 360	60	10	250	0. 80	2. 00
SF600- 150	0. 150	0. 300	60	3	600	6. 00	12. 00
SF600- 160	0. 160	0. 320	60	3	600	4. 00	10. 00
SF350(U) *	0. 350	0. 700	60	20	90	0. 50	1. 20
SD250- 080	0. 080	0. 160	60	3	250	14. 00	20. 00
SD250- 100	0. 100	0. 200	60	3	250	10. 00	16. 00
SD250- 110	0. 110	0. 220	60	3	250	8. 00	14. 00
SD250- 120	0. 120	0. 240	60	3	250	6. 00	12. 00
SD250- 130	0. 130	0. 260	60	3	250	4. 00	10. 00
SD250- 145	0. 145	0. 290	60	3	250	3. 00	8. 00
SD250- 160	0. 160	0. 320	60	3	250	2. 00	6. 00
SD250- 180	0. 180	0. 360	60	10	250	0. 80	2. 00

“ U ” suffix indicates product without insul ation coating.

PPTC Resettable Fuse

Environmental Characteristics

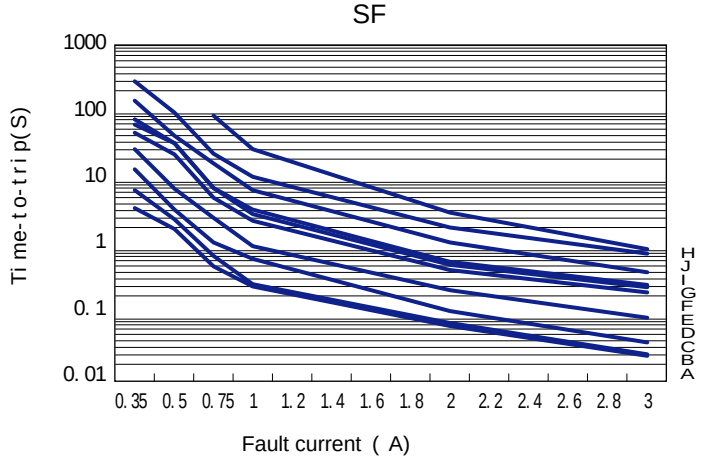
Operating/ Storage Temperature ..... - 40°C to 85°C
Maximum Device Surface Temperature in tripped State ..... 125°C
Passive Aging ..... +70, 1000hours ..... ±10% typical resistance change
Humidity Aging ..... +85°C, 85% R. H. 7days ..... ±10% typical resistance change
Thermal Shock ..... MIL-STD-202F, Method 107G ..... ±15% typical resistance change
125°C to -40°C 10times
Mechanical Shock ..... MIL-STD-202F, Method 213 ..... No resistance change
Condition1(100g, 6seconds)
Solvent Resistance ..... MIL-STD-202F, Method 215B ..... No change
Vibration ..... MIL-STD-883C, Method 2007.1 ..... No change
Condition A

Test Procedures And Requirements

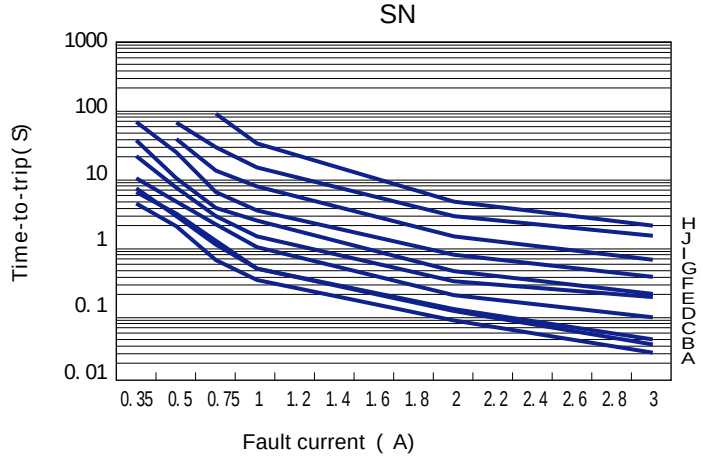
Test	Test Conditions	Accept / Reject Criteria
Resistance	In still air @25°C	Rmin≤R≤Rmax
Time to Trip	5 times Ih., Vmax, 25°C	T≤max. time to trip (seconds)
Hold Current	30 min. at Ih	No trip
Trip Cycle Life SN,SF250Series	250V, Imax, 100 cycles(6s on, 120s off)	No arcing or buring
SN,SF600Series	250V, Imax, 10 cycles(6s on, 120s off)	No arcing or buring
Trip Endurance	Vmax, 3 hours	No arcing or buring

Typical Time- to- Trip Charts at 25°C

A=SF250- 080 D=SF250- 120 G=SF250- 160 J=SF600- 160
B=SF250- 100 E=SF250- 130 H=SF250- 180
C=SF250- 110 F=SF250- 145 I =SF600- 150



A=SN250-080 D=SN250- 120 G=SN250- 160 J=SN600- 160
B=SN250- 100 E=SN250- 130 H=SN250- 180
C=SN250- 110 F=SN250- 145 I =SN600- 150



Thermal Derating Chart- Ihold (Amps)

part number	Ambient operating temperatures (°C)								
	-40°C	-20°C	0°C	25°C	40°C	50°C	60°C	70°C	85°C
SN250-080	0.130	0.116	0.111	0.080	0.072	0.065	0.057	0.050	0.039
SN250-100	0.166	0.146	0.128	0.100	0.086	0.075	0.065	0.056	0.043
SN250-110	0.177	0.158	0.137	0.110	0.097	0.086	0.076	0.067	0.052
SN250-120	0.191	0.170	0.148	0.120	0.104	0.093	0.071	0.071	0.055
SN250-130	0.204	0.185	0.160	0.130	0.116	0.105	0.080	0.080	0.060
SN250-145	0.230	0.204	0.177	0.145	0.124	0.110	0.085	0.085	0.065
SN250-160	0.250	0.220	0.195	0.160	0.137	0.123	0.095	0.095	0.074
SN250-180	0.274	0.245	0.216	0.180	0.158	0.143	0.128	0.114	0.091
SN600-150	0.238	0.211	0.183	0.150	0.128	0.115	0.101	0.088	0.067
SN600-160	0.254	0.224	0.195	0.160	0.136	0.122	0.108	0.093	0.070

Product Dimensions(millimeters)

part number	A Max	B Max	C Max	D Max	E Max	Figure	part number	A Max	B Max	C Max	Figure
SF250-080	7.0	11.0	5.0	5.0	4.6	1	SN250-080	6.2	6.2	2.6	4
SF250-100	7.0	11.0	5.0	5.0	4.6	1	SN250-100	6.2	6.2	2.6	4
SF250-110	7.0	11.0	5.0	5.0	4.6	1	SN250-110	6.2	6.2	2.6	4
SF250-120	7.0	11.0	5.0	5.0	4.6	1	SN250-120	6.2	6.2	2.6	4
SF250-120(U)*	7.0	11.0	5.0	5.0	4.6	1	SN250-130	6.3	6.3	2.6	4
SF250-130	7.0	11.0	5.0	5.0	4.6	1	SN250-145	6.3	6.3	2.6	4
SF250-145	7.0	11.0	5.0	5.0	4.6	1	SN250-160	6.3	6.3	2.6	4
SF250-160	7.0	11.0	5.0	5.0	4.6	2	SN250-180	10.2	6.5	2.6	4
SF250-180	11.5	12.0	5.0	5.0	4.6	2	SN600-150	13.0	9.0	4.5	4
SF250-180(U)*	10.2	6.5	5.0	5.0	4.2	2	SN600-160	13.0	9.0	4.5	4
SF600-150	15.0	17.0	5.0	5.0	6.5	2	SN250-110	ϕ6.7		2.6	5
SF600-160	15.0	17.0	5.0	5.0	6.5	2	SN250-120	ϕ6.7		2.6	5
SF350(U)*	ϕ6.7	4.6	5.0	-	-	3	SN250-130	ϕ6.7		2.6	5
							SN250-145	ϕ6.7		2.6	5
							SN250-160	ϕ6.7		2.6	5

How to order

SN,SF,SD__250__X__US__- RA__- B0.5__packaging option

- B-xx=Resistance matched is bias of x.x ohm
- Rx=Resistance range (Optional)
- Modifier (Optional) U=Uncoated chip S=Straight lead T=Pre-tripped device
- Hold current (mA)
- Indicates maximum interrupt voltage rating 250V or 600V
- Product family

part number	A Max	B Max	C Max	Figure
SD250-080	9.4	3.4	7.4	6
SD250-100	9.4	3.4	7.4	6
SD250-110	9.4	3.4	7.4	6
SD250-120	9.4	3.4	7.4	6
SD250-130	9.4	3.4	7.4	6
SD250-145	9.4	3.4	7.4	6
SD250-160	9.4	3.4	7.4	6
SD250-180	9.4	3.4	7.4	6

Note:All devices are available in resistance sorted and resistance binned.

Packaging option:

Bulk.....500Pcs/1000Pcs.....per bag Tape&Reel.....1500Pcs/3000Pcs.....per reel

Thermal Derating Chart- I_{hold} (Amps)

part number	Ambient operating temperatures(℃)								
	-40℃	-20℃	0℃	25℃	40℃	50℃	60℃	70℃	85℃
SF250-080	0.130	0.116	0.111	0.080	0.072	0.065	0.057	0.050	0.039
SF250-100	0.166	0.146	0.128	0.100	0.086	0.075	0.065	0.056	0.043
SF250-110	0.177	0.158	0.137	0.110	0.097	0.086	0.076	0.067	0.052
SF250-120	0.191	0.170	0.148	0.120	0.104	0.093	0.071	0.071	0.055
SF250-130	0.204	0.185	0.160	0.130	0.116	0.105	0.080	0.080	0.060
SF250-145	0.230	0.204	0.177	0.145	0.124	0.110	0.085	0.085	0.065
SF250-160	0.250	0.220	0.195	0.160	0.137	0.123	0.095	0.095	0.074
SF250-180	0.274	0.245	0.216	0.180	0.158	0.143	0.128	0.114	0.091
SF600-150	0.238	0.211	0.183	0.150	0.128	0.115	0.101	0.088	0.067
SF600-160	0.254	0.224	0.194	0.160	0.136	0.122	0.108	0.093	0.070

(I_h)= Hold current---maximum current at which the device will not trip at 25℃ still air.
(I_t) = Trip current---minimum current at which the device will always trip at 25℃ still air.
(I_{max}) = Maximum fault current device can withstand without damage at rated voltage.
(V_{max}.Interrupt)---under specified conditions (i.e.25℃) this is the highest voltage that can be applied to the device at the max current.
Initial Resistance---the initial resistance (R_{min} and R_{max})is the resistance of the resettable fuse under specified conditions (i.e.25℃) before connection into a circuit.
TUV File number.....R02134495

Environmental Characteristics

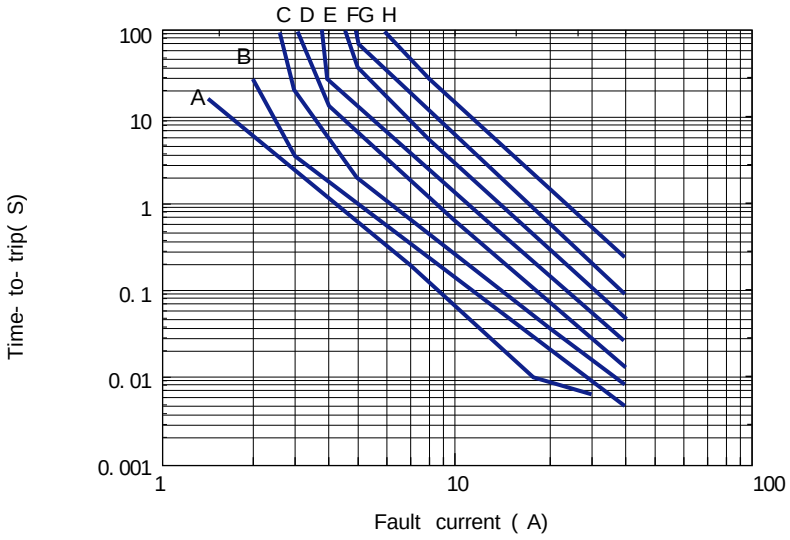
Operating/Storage Temperature.....-40℃to 85℃
Maximum Device Surface Temperature in Tripped State.....125℃
Passive Aging.....+70,1000hours.....±5% typical resistance change
Humidity Aging.....+85℃ ,85%R.H.1000hours.....±5% typical resistance change
Thermal Shock.....MIL-STD-202F,Method 107G.....±10% typical resistance change
125℃to-40℃, 10times
Mechanical Shock.....MIL-STD-202F,Method 213.....No resistance change
Solvent Resistance.....MIL-STD-202F,Method 215.....No change
Vibration.....MIL-STD-883C,,Method 2007.1.....No change
Condition A

Test Procedures And Requirements

Test	Test Conditions	Accept/Reject Criteria
Resistance	In still air @ 25℃	Rmin≤R≤Rmax
Time to Trip	5 times I_h.,Vmax,25℃	T≤ max.time to trip(seconds)
Hold Current	30 min.at I_h	No trip
Trip Cycle Life	Vmax,Imax,100 cycles	No arcing or buring
Trip Endurance	Vmax,24 hours	No arcing or buring

Typical Time- to- Trip Charts at 25℃

A=LP06-075
B=LP06-090
C=LP06-110
D=LP06-120
E=LP06-135
F=LP06-160
G=LP06-185
H=LP06-250



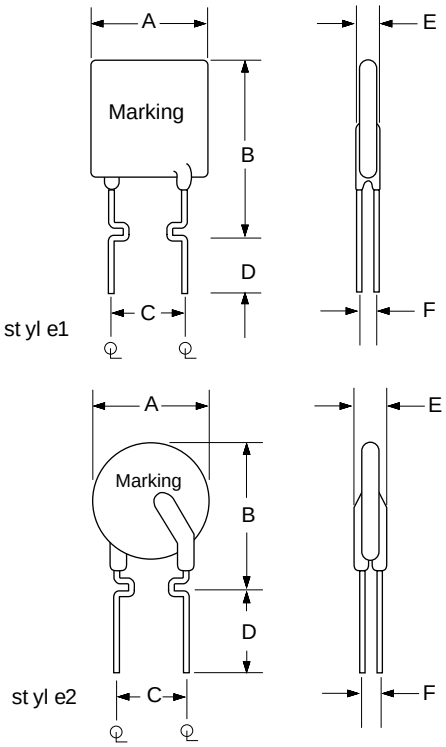
Thermal Derating Chart- I_{hold} (Amps)

part number	Ambient operating temperatures(℃)								
	-40℃	-20℃	0℃	20℃	40℃	50℃	60℃	70℃	85℃
LP06-075	1. 05	0. 95	0. 85	0. 75	0. 65	0. 60	0. 55	0. 50	0. 43
LP06-090	1. 40	1. 25	1. 10	0. 90	0. 75	0. 69	0. 65	0. 60	0. 50
LP06-110	1. 75	1. 52	1. 33	1. 10	0. 99	0. 90	0. 80	0. 73	0. 63
LP06-120	1. 69	1. 52	1. 36	1. 20	1. 04	0. 96	0. 88	0. 80	0. 68
LP06-135	2. 15	1. 94	1. 70	1. 35	1. 20	1. 14	1. 00	0. 90	0. 81
LP06-160	2. 49	2. 21	1. 94	1. 60	1. 42	1. 31	1. 19	1. 03	0. 88
LP06-185	2. 87	2. 59	2. 28	1. 85	1. 63	1. 52	1. 33	1. 21	1. 05
LP06-250	3. 82	3. 44	3. 03	2. 50	2. 17	2. 00	1. 81	1. 59	1. 39

How to order

LP__06__X__suffix

- Packaging option
- Hold current
- Voltage rating
- Product family



Packaging option:

B=Bulk packaged

Tape and Real

Bulk.....1000Pcs.....per bag

Tape&Reel.....3000Pcs.....per reel

Electrical characteristics25℃

part number	I_h (amps)	I_t (amps)	T_{trip} (seconds)	V_{max} (volts)	I_{max} (amps)	Pd_{typ} (watts)	Initial Resistance(ohms) R_{min}	R_{max}
LP06-075	0.75	1.30	0.4	6	40	0.30	0.14	0.23
LP06-090	0.90	1.80	1.2	6	40	0.60	0.10	0.18
LP06-110	1.10	2.20	2.3	6	40	0.70	0.08	0.14
LP06-120	1.20	2.00	0.5	6	40	0.60	0.08	0.14
LP06-135	1.35	2.70	4.5	6	40	0.81	0.06	0.12
LP06-160	1.60	3.20	9.0	6	40	0.90	0.05	0.11
LP06-185	1.85	3.70	10.0	6	40	1.00	0.05	0.09
LP06-250	2.50	5.00	10.0	6	40	1.21	0.03	0.06

I_h= Hold current---maximum current at which the device will not trip at 25℃ still air.
I_t = Trip current---minimum current at which the device will always trip at 25℃ still air.
V_{max} = Maximum voltage device can withstand without damage at rated current.
I_{max} = Maximum fault current device can withsand without damage at rated voltage.
Pd_{typ}= Power dissipated from device when in the tripped state in 25℃ still air environment.
T_{trip} = Maximum time to trip at 5*I_h

Product Dimensions(millimeters)

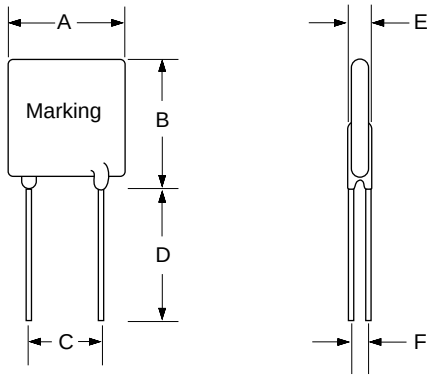
part number	A Max.	B Max.	C Typ.	D Min	E Max.	F Typ.	Physical Characteristics Style	Lead Dia*
LP06-075	6.9	11.4	5.1	7.6	3.0	0.8	2	Φ 0.5
LP06-090	7.4	13.4	5.1	7.6	3.0	0.9	1	Φ 0.5
LP06-110	7.9	14.2	5.1	7.6	3.0	0.9	1	Φ 0.5
LP06-120	7.4	12.1	5.1	7.6	3.0	0.8	2	Φ 0.5
LP06-135	8.9	13.5	5.1	7.6	3.0	0.9	1	Φ 0.5
LP06-160	8.9	15.9	5.1	7.6	3.0	0.9	1	Φ 0.5
LP06-185	10.7	15.7	5.1	7.6	3.0	0.9	1	Φ 0.5
LP06-250	11.5	18.4	5.1	7.6	3.0	0.9	1	Φ 0.5

*Lead material:Tin- plated metal wire.(Tin/Lead- plated metal wire are available)

How to order

LP__16__X__suffix

- Packaging option
- Hold current
- Voltage rating
- Product family



Packaging option:

Bulk: LP16-300~LP16-900.....1000Pcs per bag
LP16-1000~LP16-1400.....500Pcs per bag

Tape&Reel: LP16-300~LP16-1000.....3000Pcs per reel
LP16-1100~LP16-1400.....1500Pcs per reel

Electrical characteristics25℃

part number	I_h (amps)	I_t (amps)	T_{trip} (seconds)	V_{max} (volts)	I_{max} (amps)	Pd_{typ} (watts)	Initial Resistance(ohms) R_{min}	R_{max}
LP16-300	3.0	5.1	2.0	16	100	2.3	0.034	0.105
LP16-400	4.0	6.8	3.5	16	100	2.4	0.020	0.063
LP16-500	5.0	8.5	3.6	16	100	2.6	0.014	0.044
LP16-600	6.0	10.2	5.8	16	100	2.8	0.009	0.030
LP16-700	7.0	11.9	8.0	16	100	3.0	0.006	0.021
LP16-800	8.0	13.6	9.0	16	100	3.0	0.005	0.018
LP16-900	9.0	15.3	12.0	16	100	3.3	0.004	0.015
LP16-1000	10.0	17.0	12.5	16	100	3.3	0.003	0.012
LP16-1100	11.0	18.7	13.5*	16	100	3.7	0.003	0.010
LP16-1200	12.0	20.4	16.0	16	100	4.2	0.002	0.009
LP16-1400	14.0	23.8	20.0	16	100	4.6	0.002	0.008

I_h= Hold current---maximum current at which the device will not trip at 25℃ still air.
I_t = Trip current---minimum current at which the device will always trip at 25℃ still air.
V_{max} = Maximum voltage device can withstand without damage at rated current.
I_{max} = Maximum fault current device can withstand without damage at rated voltage.
Pd_{typ} = Power dissipated from device when in the tripped state in 25℃ still air environment.
T_{trip} = Maximum time to trip at 5*I_h
Device tested at 60A.

Product Dimensions(millimeters)

part number	A Max.	B Max.	C Typ.	D Min.	E Max.	F Typ.	Physical Characteristics Lead Dia*
LP16-300	7.8	11.7	5.1	7.6	3.0	1.2	Φ 0.5
LP16-400	9.6	13.5	5.1	7.6	3.0	1.2	Φ 0.5
LP16-500	11.1	15.0	5.1	7.6	3.0	1.2	Φ 0.5
LP16-600	11.4	17.8	5.1	7.6	3.0	1.2	Φ 0.5
LP16-700	11.9	20.4	5.1	7.6	3.0	1.2	Φ 0.5
LP16-800	13.4	21.6	5.1	7.6	3.0	1.2	Φ 0.5
LP16-900	14.7	22.4	5.1	7.6	3.0	1.2	Φ 0.5
LP16-1000	17.2	24.8	5.1	7.6	3.0	1.2	Φ 0.5
LP16-1100	18.2	26.7	5.1	7.6	3.0	1.2	Φ 0.5
LP16-1200	18.2	28.7	10.2	7.6	3.6	1.4	Φ 0.8
LP16-1400	28.6	28.6	10.2	7.6	3.4	1.4	Φ 0.8

Lead material:Tin-plated metal wire.(Tin/Lead-plated metal wire are available)

PPTC Resettable Fuse

Environmental Characteristics

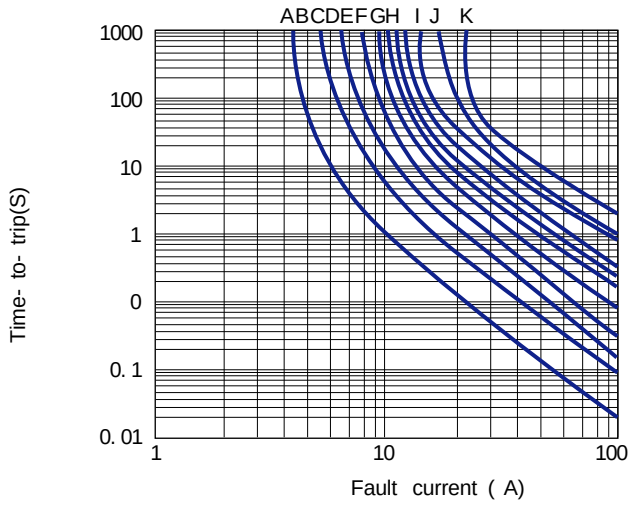
Operating/Storage Temperature.....-40℃to 85℃
Maximum Device Surface Temperature in Tripped State.....125℃
Passive Aging.....+70,1000hours.....±5% typical resistance change
Humidity Aging.....+85℃ ,85%R.H.1000hours.....±5% typical resistance change
Thermal Shock.....MIL-STD-202F,Method 107G.....±10% typical resistance change
125℃to-40℃, 10times
Mechanical Shock.....MIL-STD-202F,Method 213.....No resistance change
Solvent Resistance.....MIL-STD-202F,Method 215.....No change
Vibration.....MIL-STD-883C,,Method 2007.1.....No change
Condition A

Test Procedures And Requirements

Test	Test Conditions	Accept/Reject Criteria
Resistance	In still air @ 25℃	Rmin≤R≤Rmax
Time to Trip	5 times I_h,Vmax,25℃	T≤ max.time to trip(seconds)
Hold Current	30 min.at I_H	No trip
Trip Cycle Life	Vmax,Imax,100 cycles	No arcing or buring
Trip Endurance	Vmax,24 hours	No arcing or buring

Typical Time- to- Trip Charts at 25℃

A=LP16- 300
B- LP16- 400
C=LP16- 500
D=LP16- 600
E=LP16- 700
F=LP16- 800
G=LP16- 900
H=LP16- 1000
I =LP16- 1100
J=LP16- 1200
K=LP16- 1400



Thermal Derating Chart- I_{hold} (Amps)

part number	Ambient operating temperatures(℃)								
	- 40℃	- 20℃	0℃	25℃	40℃	50℃	60℃	70℃	85℃
LP16- 300	4. 4	4. 0	3. 6	3. 0	2. 6	2. 4	2. 1	1. 9	1. 4
LP16- 400	5. 9	5. 3	4. 8	4. 0	3. 5	3. 2	2. 8	2. 5	1. 9
LP16- 500	7. 3	6. 6	6. 0	5. 0	4. 4	4. 0	3. 6	3. 1	2. 4
LP16- 600	8. 3	8. 0	7. 2	6. 0	5. 2	4. 8	4. 2	3. 8	2. 8
LP16- 700	10. 3	9. 3	8. 4	7. 0	6. 2	5. 6	5. 0	4. 4	3. 3
LP16- 800	11. 7	10. 7	9. 6	8. 0	6. 9	6. 4	5. 6	5. 1	3. 7
LP16- 900	13. 2	11. 9	10. 7	9. 0	7. 9	7. 2	6. 4	5. 6	4. 2
LP16- 1000	14. 7	13. 3	12. 0	10. 0	8. 7	8. 0	7. 0	6. 3	4. 7
LP16- 1100	16. 1	14. 6	13. 1	11. 0	9. 7	8. 8	7. 8	6. 9	5. 2
LP16- 1200	17. 6	16. 0	14. 4	12. 0	10. 4	9. 6	8. 4	7. 6	5. 6
LP16- 1400	20. 5	18. 7	16. 8	14. 0	12. 1	11. 2	9. 8	8. 9	6. 5

How to order

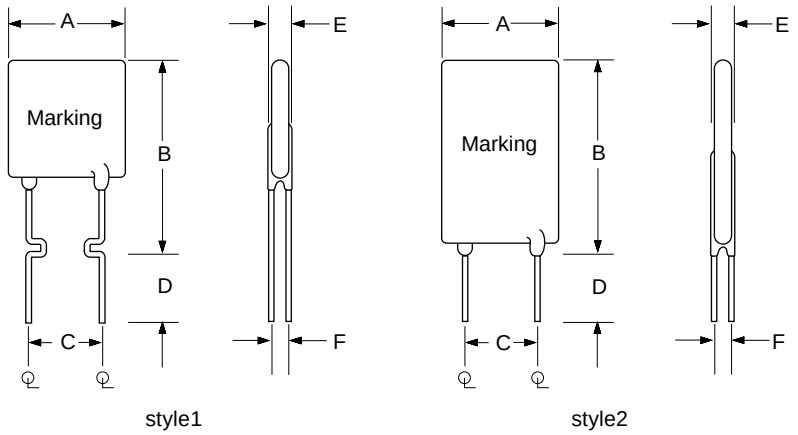
LP__30__X__suffix

- Packaging option
- Hold current
- Voltage rating
- Product family

Packaging option:

Bulk.....500Pcs/1000Pcs.....per bag

Tape&Reel.....1500Pcs/3000Pcs.....per reel



Electrical characteristics25℃

part number	I_h (amps)	I_t (amps)	T_{trip} (seconds)	V_{max} (volts)	I_{max} (amps)	Pd_{typ} (watts)	Initial Resistance(ohms) R_{min}	R_{max}
LP30-090	0.90	1.80	7.1	30	40	0.91	0.070	0.12
LP30-110	1.10	2.20	6.6	30	40	1.00	0.050	0.10
LP30-135	1.35	2.70	7.3	30	40	1.11	0.040	0.08
LP30-160	1.60	3.20	8.0	30	40	1.20	0.030	0.07
LP30-185	1.85	3.70	8.7	30	40	1.27	0.030	0.06
LP30-250	2.50	5.00	10.3	30	40	1.34	0.020	0.04
LP30-300	3.00	6.00	10.8	30	40	2.00	0.020	0.05
LP30-400	4.00	8.00	12.7	30	40	2.50	0.010	0.03
LP30-500	5.00	10.00	14.5	30	40	3.00	0.010	0.03
LP30-600	6.00	12.00	16.0	30	40	3.50	0.005	0.02
LP30-700	7.00	14.00	17.5	30	40	3.80	0.005	0.02
LP30-800	8.00	16.00	18.8	30	40	4.00	0.005	0.02
LP30-900	9.00	18.00	20.0*	30	40	4.20	0.005	0.01

I_h= Hold current---maximum current at which the device will not trip at 25℃ still air.
I_t = Trip current---minimum current at which the device will always trip at 25℃ still air.
V_{max} = Maximum voltage device can withstand without damage at rated current.
I_{max} = Maximum fault current device can withstand without damage at rated voltage.
Pd_{typ}= Power dissipated from device when in the tripped state in 25℃ still air environment.
T_{trip} = Maximum time to trip at 5*I_h
Device tested at 40A.

Product Dimensions(millimeters)

part number	A Max.	B Max.	C Typ. 5.1	D Min.	E Max.	F Typ.	Physical Characteristics Style	Lead Dia*
LP30-090	8.7	13.5	5.1	7.6	3.0	0.9	1	Φ 0.5
LP30-110	8.7	14.2	5.1	7.6	3.0	0.9	1	Φ 0.5
LP30-135	8.9	13.5	5.1	7.6	3.0	0.9	1	Φ 0.5
LP30-160	10.7	15.9	5.1	7.6	3.0	0.9	1	Φ 0.5
LP30-185	10.7	15.7	5.1	7.6	3.0	0.9	1	Φ 0.5
LP30-250	11.7	18.3	5.1	7.6	3.0	0.9	1	Φ 0.5
LP30-300	11.7	19.9	5.1	7.6	3.0	1.2	2	Φ 0.8
LP30-400	14.0	22.9	10.2	7.6	3.0	1.2	2	Φ 0.8
LP30-500	14.2	27.4	10.2	7.6	3.0	1.2	2	Φ 0.8
LP30-600	16.7	27.4	10.2	7.6	3.0	1.2	2	Φ 0.8
LP30-700	19.2	29.4	10.2	7.6	3.0	1.2	2	Φ 0.8
LP30-800	21.6	31.9	10.2	7.6	3.0	1.2	2	Φ 0.8
LP30-900	24.2	32.4		7.6	3.0	1.2	2	Φ 0.8

*Lead material:Tin-plated metal wire.(Tin/Lead-plated metal wire are available)

Environmental Characteristics

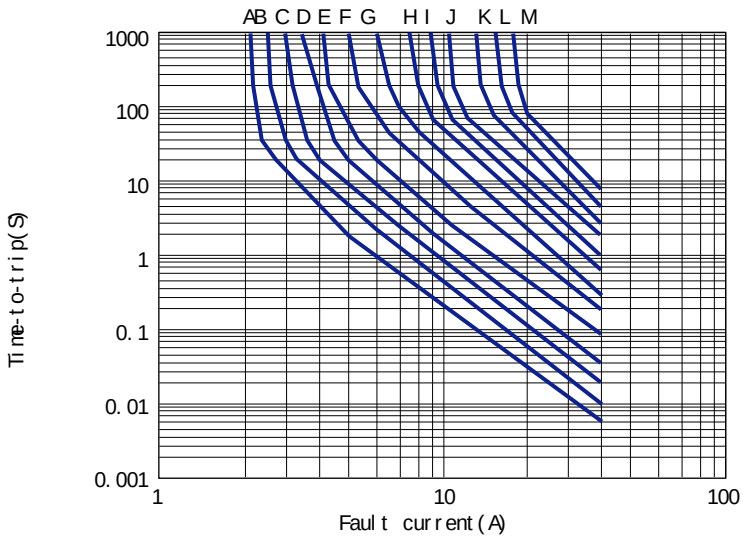
Operating/Storage Temperature.....-40℃to 85℃
Maximum Device Surface Temperature in Tripped State.....125℃
Passive Aging.....+70,1000hours.....±5% typical resistance change
Humidity Aging.....+85℃ ,85%R.H.1000hours.....±5% typical resistance change
Thermal Shock.....MIL-STD-202F,Method 107G.....±10% typical resistance change
125℃to-40℃, 10times
Mechanical Shock.....MIL-STD-202F,Method 213.....No resistance change
Solvent Resistance.....MIL-STD-202F,Method 215.....No change
Vibration.....MIL-STD-883C,,Method 2007.1.....No change
Condition A

Test Procedures And Requirements

Test	Test Conditions	Accept/Reject Criteria
Resistance	In still air @ 25℃	Rmin≤R≤Rmax
Time to Trip	5 times I_h.,Vmax,25℃	T≤ max.time to trip(seconds)
Hold Current	30 min.at I_h	No trip
Trip Cycle Life	Vmax,Imax,100 cycles	No arcing or buring
Trip Endurance	Vmax,24 hours	No arcing or buring

Typical Time- to- Trip Charts at 25℃

A=LP30-090
B=LP30-110
C=LP30-135
D=LP30-160
E=LP30-185
F=LP30-250
G=LP30-300
H=LP30-400
I =LP30-500
J=LP30-600
K=LP30-700
L=LP30-800
M=LP30-900



Thermal Derating Chart- I_{hold} (Amps)

part number	Ambient operating temperatures(℃)								
	-40℃	-20℃	0℃	25℃	40℃	50℃	60℃	70℃	85℃
LP30-090	1. 40	1. 25	1. 10	0. 90	0. 75	0. 69	0. 65	0. 60	0. 50
LP30-110	1. 75	1. 52	1. 33	1. 10	0. 99	0. 90	0. 80	0. 73	0. 63
LP30-135	2. 15	1. 94	1. 70	1. 35	1. 20	1. 14	1. 00	0. 90	0. 81
LP30-160	2. 49	2. 21	1. 94	1. 60	1. 42	1. 31	1. 19	1. 03	0. 88
LP30-185	2. 87	2. 59	2. 28	1. 85	1. 63	1. 52	1. 33	1. 21	1. 05
LP30-250	3. 82	3. 44	3. 03	2. 50	2. 17	2. 00	1. 81	1. 59	1. 39
LP30-300	4. 55	4. 10	3. 60	3. 00	2. 65	2. 51	2. 24	2. 01	1. 74
LP30-400	6. 00	5. 40	4. 74	4. 00	3. 47	3. 28	2. 82	2. 63	2. 26
LP30-500	7. 44	6. 68	5. 80	5. 00	4. 30	4. 03	3. 58	3. 22	2. 77
LP30-600	8. 90	7. 99	7. 08	6. 00	5. 13	4. 82	4. 27	3. 84	3. 30
LP30-700	10. 35	9. 30	8. 21	7. 00	5. 95	5. 58	4. 96	4. 46	3. 84
LP30-800	11. 60	10. 60	9. 35	8. 00	6. 79	6. 36	5. 64	5. 07	4. 36
LP30-900	13. 25	11. 90	10. 49	9. 00	7. 53	7. 12	6. 32	5. 69	4. 88

PPTC Resettable Fuse

SUNON

How to order

LP__60__X__suffix

- Packaging option
- Hold current
- Voltage rating
- Product family

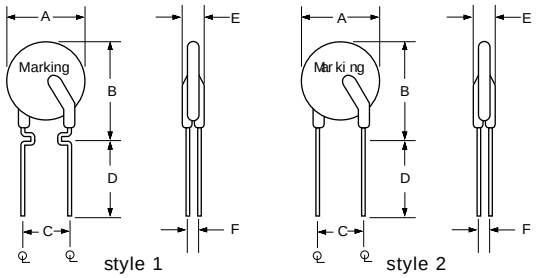
Packaging option:

Bulk.....500Pcs/1000Pcs

.....per bag

Tape&Reel.....1000Pcs/1500Pcs/3000Pcs

.....per reel



Electrical characteristics25℃

part number	I_h (amps)	I_t (amps)	T_{trip} (seconds)	V_{max} (volts)	I_{max} (amps)	Pd_{typ} (watts)	Initial Resistance(ohms) R_{min}	R_{max}
LP60-010	0.10	0.20	8.0	60	40	0.51	2.50	4.50
LP60-017	0.17	0.34	5.0	60	40	0.60	2.00	3.20
LP60-020	0.20	0.40	3.6	60	40	0.52	1.50	2.84
LP60-025	0.25	0.50	3.2	60	40	0.52	1.00	1.95
LP60-030	0.30	0.60	3.0	60	40	0.59	0.76	1.36
LP60-040	0.40	0.80	3.8	60	40	0.66	0.52	0.86
LP60-050	0.50	1.00	4.0	60	40	0.80	0.41	0.77
LP60-065	0.65	1.30	5.3	60	40	0.90	0.27	0.48
LP60-075	0.75	1.50	6.3	60	40	0.95	0.18	0.40
LP60-090	0.90	1.80	7.2	60	40	1.00	0.14	0.31
LP60-110	1.10	2.20	8.2	60	40	1.51	0.14	0.25
LP60-135	1.35	2.70	9.6	60	40	1.71	0.12	0.19
LP60-160	1.60	3.20	11.4	60	40	1.98	0.09	0.14
LP60-185	1.85	3.70	12.6	60	40	2.10	0.08	0.12
LP60-250	2.50	5.00	15.6	60	40	2.50	0.05	0.08
LP60-300	3.00	6.00	19.8	60	40	2.80	0.04	0.06
LP60-375	3.75	7.50	24.0	60	40	3.20	0.03	0.05

I_h= Hold current---maximum current at which the device will not trip at 25℃ still air.
I_t = Trip current---minimum current at which the device will always trip at 25℃ still air.
V_{max} = Maximum voltage device can withstand without damage at rated current.
I_{max} = Maximum fault current device can withstand without damage at rated voltage.
Pd_{typ}= Power dissipated from device when in the tripped state in 25℃ still air environment.
T_{trip} = Maximum time to trip at 5*I_h

Product Dimensions(millimeters)(mm)

part number	A Max.	B Max.	C Typ.	D Min.	E Max.	F Typ.	Physical Characteristics Style	Lead Dia*
LP60-010	7.4	12.7	5.1	7.6	3.1	1.1	1	Φ 0.5
LP60-017	7.4	12.7	5.1	7.6	3.1	1.1	1	Φ 0.5
LP60-020	7.4	12.7	5.1	7.6	3.1	1.1	1	Φ 0.5
LP60-025	7.4	12.7	5.1	7.6	3.1	1.1	1	Φ 0.5
LP60-030	7.4	13.0	5.1	7.6	3.1	1.1	1	Φ 0.5
LP60-040	7.6	13.5	5.1	7.6	3.1	1.1	1	Φ 0.5
LP60-050	7.9	13.7	5.1	7.6	3.1	1.1	1	Φ 0.5
LP60-065	9.7	14.5	5.1	7.6	3.1	1.1	1	Φ 0.5
LP60-075	10.7	15.5	5.1	7.6	3.1	1.1	1	Φ 0.5
LP60-090	11.7	16.5	5.1	7.6	3.1	1.1	1	Φ 0.5
LP60-110	13.0	18.0	5.1	7.6	3.1	1.4	2	Φ 0.8
LP60-135	15.7	19.6	5.1	7.6	3.1	1.4	2	Φ 0.8
LP60-160	16.7	21.3	5.1	7.6	3.1	1.4	2	Φ 0.8
LP60-185	17.8	22.9	5.1	7.6	3.1	1.4	2	Φ 0.8
LP60-250	21.3	26.4	10.2	7.6	3.1	1.4	2	Φ 0.8
LP60-300	24.9	30.0	10.2	7.6	3.1	1.4	2	Φ 0.8
LP60-375	28.5	33.5	10.2	7.6	3.1	1.4	2	Φ 0.8

*Lead material:Tin-plated metal wire.(Tin/Lead-plated metal wire are available)

PPTC Resettable Fuse

Environmental Characteristics

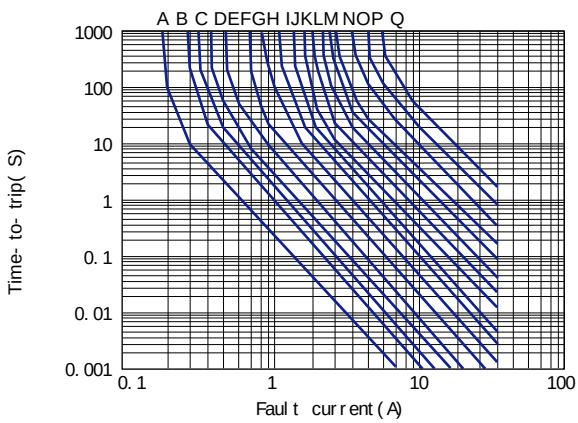
Operating/Storage Temperature.....-40℃to 85℃
Maximum Device Surface Temperature in Tripped State.....125℃
Passive Aging.....+70,1000hours.....±8% typical resistance change
Humidity Aging.....+85℃ ,85%R.H.1000hours.....±5% typical resistance change
Thermal Shock.....MIL-STD-202F,Method 107G.....±12% typical resistance change
125℃ to-40℃, 10times
Mechanical Shock.....MIL-STD-202F,Method 213.....No resistance change
Solvent Resistance.....MIL-STD-202F,Method 215.....No change
Vibration.....MIL-STD-883C,,Method 2007.1.....No change
Condition A

Test Procedures And Requirements

Test	Test Conditions	Accept/Reject Criteria
Resistance	In still air @ 25℃	Rmin≤R≤Rmax
Time to Trip	5 times I_h.,Vmax,25℃	T≤ max.time to trip(seconds)
Hold Current	30 min.at I_h	No trip
Trip Cycle Life	Vmax,Imax,100 cycles	No arcing or buring
Trip Endurance	Vmax,24 hours	No arcing or buring

Typical Time- to- Trip Charts at 25℃

A=LP60-010
B=LP60-017
C=LP60-020
D=LP60-025
E=LP60-030
F=LP60-040
G=LP60-050
H=LP60-065
I =LP60-075
J=LP60-090
K=LP60-110
L=LP60-135
M=LP60-160
N=LP60-185
O=LP60-250
P=LP60-300
Q=LP60-375



Thermal Derating Chart- I_{hold} (Amps)

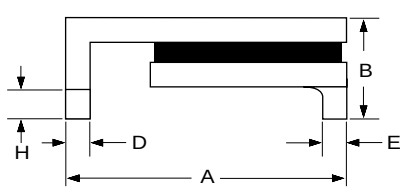
part number	Ambient operating temperatures(℃)								
	-40℃	-20℃	0℃	25℃	40℃	50℃	60℃	70℃	85℃
LP60-010	0. 18	0. 15	0. 13	0. 10	0. 08	0. 07	0. 06	0. 05	0. 03
LP60-017	0. 28	0. 24	0. 20	0. 17	0. 14	0. 12	0. 10	0. 09	0. 06
LP60-020	0. 34	0. 29	0. 25	0. 20	0. 16	0. 14	0. 13	0. 10	0. 07
LP60-025	0. 42	0. 36	0. 31	0. 25	0. 20	0. 18	0. 16	0. 12	0. 09
LP60-030	0. 52	0. 44	0. 38	0. 30	0. 24	0. 22	0. 18	0. 14	0. 10
LP60-040	0. 66	0. 57	0. 50	0. 40	0. 32	0. 29	0. 24	0. 20	0. 14
LP60-050	0. 83	0. 74	0. 63	0. 50	0. 41	0. 36	0. 30	0. 25	0. 18
LP60-065	1. 10	0. 95	0. 82	0. 65	0. 53	0. 47	0. 40	0. 33	0. 24
LP60-075	1. 26	1. 11	0. 95	0. 75	0. 61	0. 54	0. 45	0. 39	0. 28
LP60-090	1. 52	1. 30	1. 15	0. 90	0. 73	0. 65	0. 55	0. 47	0. 33
LP60-110	1. 82	1. 60	1. 35	1. 10	0. 89	0. 79	0. 65	0. 55	0. 40
LP60-135	2. 20	1. 91	1. 65	1. 35	1. 09	0. 96	0. 80	0. 68	0. 50
LP60-160	2. 60	2. 30	1. 95	1. 60	1. 30	1. 13	1. 00	0. 80	0. 60
LP60-185	3. 00	2. 63	2. 30	1. 85	1. 50	1. 33	1. 12	0. 92	0. 67
LP60-250	4. 05	3. 58	3. 02	2. 50	2. 02	1. 80	1. 55	1. 30	0. 90
LP60-300	4. 82	4. 16	3. 62	3. 00	2. 43	2. 16	1. 85	1. 50	1. 09
LP60-375	6. 02	5. 19	4. 50	3. 75	3. 02	2. 68	2. 30	1. 95	1. 39

PPTC Resettable Fuse

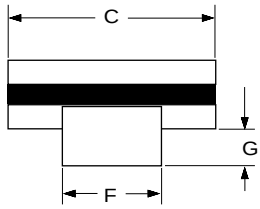
How to order

LP-SM__X__suffix

- Packaging option
- Hold current
- Product family



Side View



End View

Packaging option:

Bulk.....500Pcs/1000Pcs.....per bag

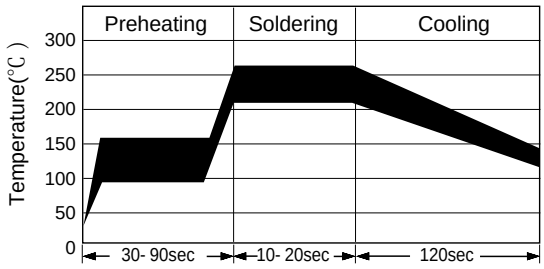
Tape&Reel.....2000Pcs.....per reel

Solder reflow

- Recommended reflow methods:IR,Vapor phase oven,hot air oven.
- Devices are not designed to be wave soldered to the bottom side of the board.
- Devices can be cleaned using standard industry methods and solvents.

CAUTION:

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



Electrical characteristics25℃

part number	I_h (amps)	I_t (amps)	T_{trip} (amps)	T_{trip} (seconds)	V_{max} (volts)	I_{max} (amps)	Pd_{typ} (watts)	$*R_{max}$ (ohms)
LP-SM030	0.30	0.60	1.5	3.0	60	10	1.9	4.800
LP-SM050	0.50	1.00	2.5	4.0	60	10	1.9	1.400
LP-SM075	0.75	1.50	8.0	0.3	30	40	1.9	1.000
LP-SM110	1.10	2.20	8.0	0.5	33	40	1.9	0.480
LP-SM125	1.25	2.50	8.0	2.0	15	40	1.6	0.400
LP-SM150	1.50	3.00	8.0	5.0	33	40	2.1	0.250
LP-SM185	1.85	3.70	8.0	5.0	33	40	2.1	0.165
LP-SM200	2.00	4.00	8.0	12.0	15	40	2.1	0.125
LP-SM250	2.50	5.00	8.0	25.0	15	40	2.1	0.085
LP-SM260	2.60	5.20	8.0	21.0	6	40	1.9	0.075
LP-SM300	3.00	6.00	8.0	35.0	6	40	1.9	0.048

*Rmax=Maximum resistance measured in the nontripped state 1 hour post reflow with reflow conditions of 260℃ for 20 sec.

Product Dimensions(millimeters)

part number	A		B	C	D		E		F		G		H
	Min	Max	Max	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
LP-SM030	6.73	7.98	3.18	5.44	0.56	0.71	0.56	0.71	2.16	2.41	0.66	1.37	0.43
LP-SM050	6.73	7.98	3.18	5.44	0.56	0.71	0.56	0.71	2.16	2.41	0.66	1.37	0.43
LP-SM075	6.73	7.98	3.18	5.44	0.56	0.71	0.56	0.71	2.16	2.41	0.66	1.37	0.43
LP-SM110	6.73	7.98	3.00	5.44	0.56	0.71	0.56	0.71	2.16	2.41	0.66	1.37	0.43
LP-SM125	6.73	7.98	3.00	5.44	0.56	0.71	0.56	0.71	2.16	2.41	0.66	1.37	0.43
LP-SM150	8.00	9.50	3.00	6.71	0.56	0.71	0.56	0.71	3.68	3.94	0.66	1.37	0.43
LP-SM185	8.00	9.50	3.00	6.71	0.56	0.71	0.56	0.71	3.68	3.94	0.66	1.37	0.43
LP-SM200	8.00	9.50	3.00	6.71	0.56	0.71	0.56	0.71	3.68	3.94	0.66	1.37	0.43
LP-SM250	8.00	9.50	3.00	6.71	0.56	0.71	0.56	0.71	3.68	3.94	0.66	1.37	0.43
LP-SM260	6.73	7.98	3.00	5.44	0.56	0.71	0.56	0.71	2.16	2.41	0.66	1.37	0.43
LP-SM300	6.73	7.98	3.00	5.44	0.56	0.71	0.56	0.71	2.16	2.41	0.66	1.37	0.43

PPTC Resettable Fuse

SUNON

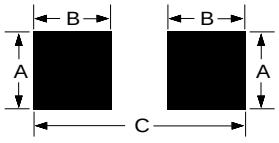
Environmental Characteristics

Operating/Storage Temperature.....-40℃to 85℃
Maximum Device Surface Temperature in Tripped State.....125℃
Passive Aging.....+70,1000hours.....±8% typical resistance change
Humidity Aging.....+85℃ ,85%R.H.1000hours.....±5% typical resistance change
Thermal Shock.....MIL-STD-202F,Method 107G.....±12% typical resistance change
125℃to-40℃, 10times
Mechanical Shock.....MIL-STD-202F,Method 213.....No resistance change
Solvent Resistance.....MIL-STD-202F,Method 215.....No change
Vibration.....MIL-STD-883C,,Method 2007.1.....No change
Condition A

Test Procedures And Requirements

Test	Test Conditions	Accept/Reject Criteria
Resistance	In still air @ 25℃	Rmin≤R≤Rmax
Time to Trip	At specified current,Vmax,25℃	T≤ max.time to trip(seconds)
Hold Current	30 min.at I_h	No trip
Trip Cycle Life	Vmax,Imax,100 cycles	No arcing or buring
Trip Endurance	Vmax,24 hours	No arcing or buring

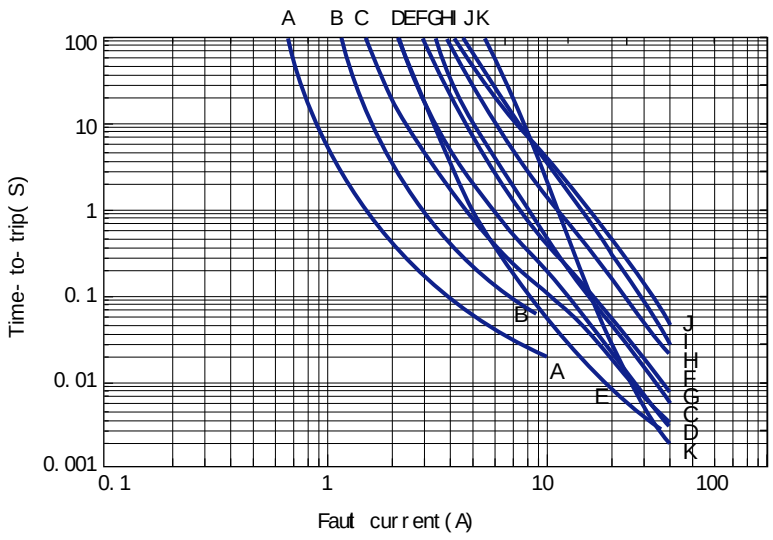
Recommended pad layout(mm)



part number	A	B	C
	nom	nom	nom
LP-SM030	3.1	2.3	9.7
LP-SM050	3.1	2.3	9.7
LP-SM075	3.1	2.3	9.7
LP-SM110	3.1	2.3	9.7
LP-SM125	3.1	2.3	9.7
LP-SM150	4.6	2.3	10.7
LP-SM185	4.6	2.3	10.7
LP-SM200	4.6	2.3	10.7
LP-SM250	4.6	2.3	10.7
LP-SM260	3.1	2.3	9.7
LP-SM300	3.1	2.3	9.7

Typical Time- to- Trip Charts at 25℃

A=LP-SM030
B=LP-SM050
C=LP-SM075
D=LP-SM110
E=LP-SM125
F=LP-SM150
G=LP-SM185
H=LP-SM200
I =LP-SM250
J=LP-SM260
K=LP-SM300



Thermal Derating Chart- I_{hold} (Amps)

part number	Ambient operating temperatures(℃)								
	-40℃	-20℃	0℃	25℃	40℃	50℃	60℃	70℃	85℃
LP-SM030	0.45	0.40	0.35	0.30	0.25	0.23	0.20	0.17	0.14
LP-SM050	0.76	0.67	0.59	0.50	0.42	0.38	0.33	0.29	0.23
LP-SM075	1.13	1.01	0.88	0.75	0.62	0.56	0.50	0.44	0.34
LP-SM110	1.66	1.47	1.29	1.10	0.91	0.83	0.73	0.64	0.50
LP-SM125	1.89	1.68	1.46	1.25	1.04	0.94	0.83	0.73	0.56
LP-SM150	2.27	2.01	1.76	1.50	1.25	1.31	1.00	0.87	0.68
LP-SM185	2.20	2.08	1.96	1.85	1.70	1.66	1.50	1.48	1.40
LP-SM200	3.02	2.68	2.34	2.00	1.66	1.50	1.32	1.16	0.90
LP-SM250	3.78	3.35	2.93	2.50	2.08	1.88	1.65	1.45	1.13
LP-SM260	3.64	3.25	2.91	2.60	2.26	2.08	1.95	1.74	1.48
LP-SM300	4.01	3.67	3.32	3.00	2.60	2.40	2.25	2.10	1.80

PPTC Resettable Fuse

How to order

LP-MSM_X_suffix

- Packaging option
- Hold current
- Product family

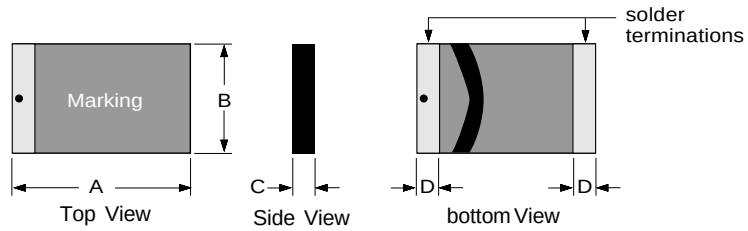


figure 1

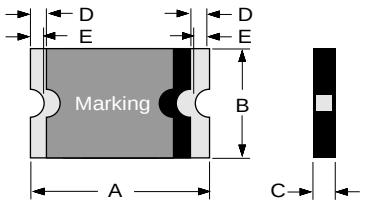


figure 2

Packaging:

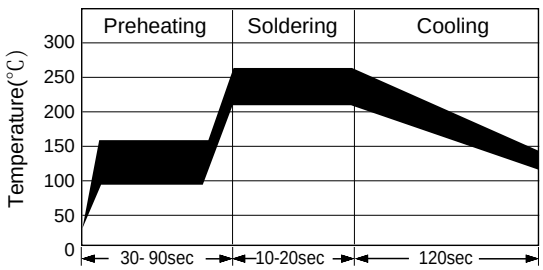
All model.....1500 pcs per reel

Solder reflow

- Recommended reflow methods:IR,Vapor phase oven,hot air oven.
- The LP-MSMA series devices are not designed to be wave soldered to the bottom side of the board.
- The LP-MSMB series devices are suitable for use with wave solder application method.
- Devices can be cleaned using standard methods and solvents.

CAUTION:

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



Electrical characteristics25℃

part number	I_h (amps)	I_t (amps)	T_{trip} (amps)	T_{trip} (seconds)	V_{max} (volts)	I_{max} (amps)	Pd_{typ} (watts)	$*R_{max}$ (ohms)
LP-MSMB014	0.14	0.34	8.0	0.15	60	10	1.0	15.00
LP-MSMA020	0.20	0.40	8.0	0.02	30	10	1.0	5.00
LP-MSMB035	0.35	0.70	8.0	0.20	6	40	1.0	1.30
LP-MSMA050	0.50	1.00	8.0	0.15	15	40	1.0	1.00
LP-MSMB050	0.50	1.00	8.0	0.15	15	40	1.0	1.00
LP-MSMA075	0.75	1.50	8.0	0.20	13.2	40	1.0	0.45
LP-MSMB075	0.75	1.50	8.0	0.20	13.2	40	1.0	0.45
LP-MSMB110	1.10	2.20	8.0	0.30	6	40	1.0	0.21
LP-MSMB190	1.90	3.80	10.0	2.00	16	100	1.5	0.08

*Rmax=Maximum resistance measured in the nontripped state 1 hour post reflow with reflow conditions of 260℃ for 20 sec.

Product Dimensions(millimeters)

part number	Fig	A		B		C		D	E	
		Min	Max	Min	Max	Min	Max	Min	Min	Max
LP-MSMB014	2	4.37	4.73	3.07	3.41	0.63	0.89	0.30	0.25	0.50
LP-MSMA020	1	4.37	4.73	3.07	3.41	0.56	0.81	0.65	-	-
LP-MSMB035	2	3.00	3.43	2.35	2.80	0.38	0.62	0.35	0.25	0.50
LP-MSMA050	1	4.37	4.73	3.07	3.41	0.38	0.62	0.30	-	-
LP-MSMB050	2	4.37	4.73	3.07	3.41	0.38	0.62	0.65	0.25	0.50
LP-MSMA075	1	4.37	4.73	3.07	3.41	0.38	0.62	0.30	-	-
LP-MSMB075	2	4.37	4.73	3.07	3.41	0.38	0.62	0.65	0.25	0.50
LP-MSMB110	2	4.37	4.73	3.07	3.41	0.33	0.53	0.30	0.25	0.50
LP-MSMB190	2	11.15	11.51	4.83	5.33	0.33	0.53	0.51	-	-

PPTC Resettable Fuse

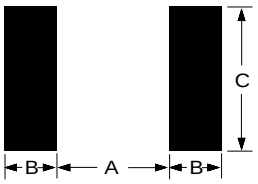
Environmental Characteristics

Operating/Storage Temperature.....-40℃to 85℃
Maximum Device Surface Temperature in Tripped State.....125℃
Passive Aging.....+70,1000hours.....±8% typical resistance change
Humidity Aging.....+85℃ ,85%R.H.1000hours.....±5% typical resistance change
Thermal Shock.....MIL-STD-202F,Method 107G.....±12% typical resistance change
125℃to-40℃, 10times
Mechanical Shock.....MIL-STD-202F,Method 213.....No resistance change
Solvent Resistance.....MIL-STD-202F,Method 215.....No change
Vibration.....MIL-STD-883C,,Method 2007.1.....No change
Condition A

Test Procedures And Requirements

Test	Test Conditions	Accept/Reject Criteria
Resistance	In still air @ 25℃	Rmin≤R≤Rmax
Time to Trip	At specified current,Vmax,25℃	T≤ max.time to trip(seconds)
Hold Current	30 min.at I_h	No trip
Trip Cycle Life	Vmax,Imax,100 cycles	No arcing or buring
Trip Endurance	Vmax,24 hours	No arcing or buring

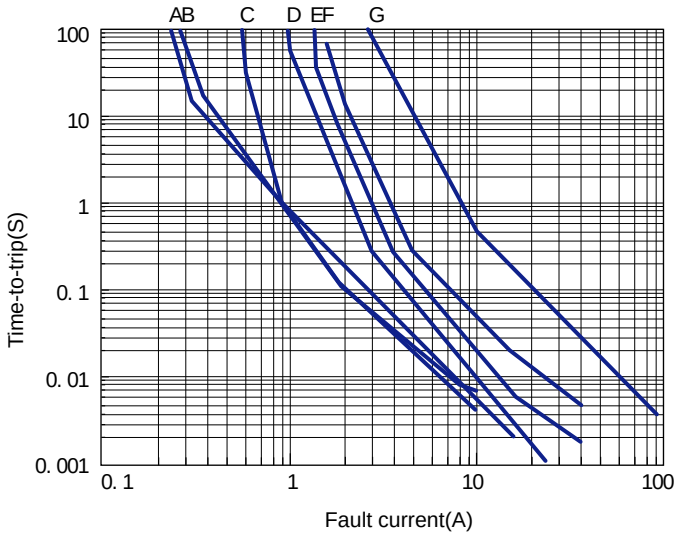
Recommended pad layout(mm)



part number	A nom.	B nom.	C nom.
LP-MSMB014	3.45	1.78	3.15
LP-MSMA020	2.46	1.78	3.09
LP-MSMB035	2.00	1.00	2.50
LP-MSMA050	3.45	1.78	3.15
LP-MSMB050	2.46	1.78	3.09
LP-MSMA075	3.45	1.78	3.15
LP-MSMB075	2.46	1.78	3.09
LP-MSMB110	3.45	1.78	3.15
LP-MSMB190	9.57	1.45	4.75

Typical Time-to-Trip Charts at 25℃

A=LP-MSMB014
B=LP-MSMA020
C=LP-MSMB035
D=LP-MSMA050
LP-MSMB050
E=LP-MSMA075
LP-MSMB075
F=LP-MSMB110
G=LP-MSMB190



Thermal Derating Chart-I_{hold} (Amps)

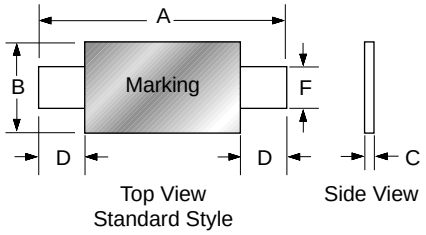
part number	Ambient operating temperatures(℃)								
	-40℃	-20℃	0℃	25℃	40℃	50℃	60℃	70℃	85℃
LP-MSMB014	0.23	0.19	0.17	0.14	0.12	0.10	0.09	0.08	0.06
LP-MSMA020	0.29	0.26	0.23	0.20	0.17	0.15	0.14	0.12	0.10
LP-MSMB035	0.47	0.45	0.40	0.35	0.30	0.28	0.24	0.21	0.18
LP-MSMA050	0.77	0.68	0.59	0.50	0.44	0.40	0.37	0.33	0.29
LP-MSMB050	0.77	0.68	0.59	0.50	0.44	0.40	0.37	0.33	0.29
LP-MSMA075	1.15	1.01	0.88	0.75	0.65	0.60	0.55	0.49	0.43
LP-MSMB075	1.15	1.01	0.88	0.75	0.65	0.60	0.55	0.49	0.43
LP-MSMB110	1.59	1.43	1.26	1.10	0.95	0.87	0.80	0.71	0.60
LP-MSMB190	3.04	2.70	2.20	1.90	1.44	1.23	1.00	0.78	0.49

PPTC Resettable Fuse

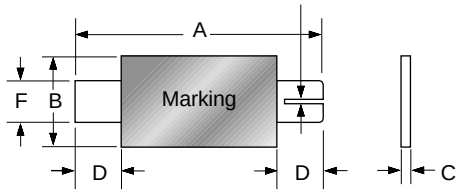
How to order

LP__X__style__suffix

- Packaging option
- Style
- Hold current
- Product family



Slit:0.5mmx4.0mm nominal



Packaging:

All model packged in bulk.....500 pcs each

Electrical characteristics25℃

part number	I_h (amps)	I_t (amps)	T_{trip} (seconds)	V_{max} (volts)	I_{max} (amps)	Pd_{typ} (watts)	Initial Resistance(ohms) R_{min}	R_{max}
LP070	0.70	1.45	5.0	15	100	1.50	0.100	0.200
LP100	1.00	2.50	7.0	24	100	1.50	0.070	0.130
LP120	1.20	2.70	5.0	15	100	1.50	0.085	0.160
LP175	1.75	3.80	5.0	15	100	1.60	0.050	0.090
LP180	1.80	3.80	2.9	24	100	2.00	0.040	0.068
LP190	1.90	4.20	3.0	24	100	2.00	0.030	0.057
LP200	2.00	4.40	4.0	30	100	1.90	0.030	0.060
LP260	2.60	5.20	5.0	24	100	2.40	0.025	0.042
LP300	3.00	6.30	4.0	24	100	2.20	0.015	0.031
LP310	3.10	6.00	5.0	24	100	2.50	0.018	0.030
LP340	3.40	6.80	5.0	24	100	2.70	0.016	0.027
LP350	3.50	6.30	3.0*	24	100	2.50	0.017	0.031
LP420	4.20	7.60	6.0*	24	100	2.90	0.012	0.024

I_h= Hold current---maximum current at which the device will not trip at 25℃ still air.
I_t = Trip current---minimum current at which the device will always trip at 25℃ still air.
V_{max} = Maximum voltage device can withstand without damage at rated current.
I_{max} = Maximum fault current device can withstand without damage at rated voltage.
Pd_{typ}= Power dissipated from device when in the tripped state in 25℃ still air environment.
T_{trip} = Maximum time to trip at 5*I_h
Device tested at 20A.

Product Dimensions(millimeters)

part number	A		B		C		D		F	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
LP070	17.5	22.1	4.9	5.4	0.7	1.2	4.0	7.5	3.9	4.1
LP100	17.5	22.1	4.9	5.4	0.6	1.0	4.0	7.5	3.9	4.1
LP120	17.5	22.1	4.9	5.4	0.6	1.0	4.0	7.5	3.9	4.1
LP175	20.9	23.1	4.9	5.4	0.6	1.0	4.0	5.5	3.9	4.1
LP180	20.9	23.1	4.9	5.4	0.6	1.0	4.0	5.5	3.9	4.1
LP190	20.9	23.1	7.9	8.4	0.5	1.1	5.0	7.6	4.8	5.4
LP200	20.9	23.1	7.9	8.4	0.5	1.1	5.0	7.6	4.8	5.4
LP260	20.9	23.1	7.9	8.4	0.6	1.0	5.0	7.6	4.8	5.4
LP300	25.4	28.5	13.0	13.7	0.5	1.1	5.0	7.0	4.8	5.4
LP310	25.4	28.5	13.0	13.7	0.6	1.0	5.0	7.0	4.8	5.4
LP340	25.4	28.5	13.0	13.7	0.6	1.0	5.0	7.0	4.8	5.4
LP350	25.4	28.5	13.0	13.7	0.5	1.1	5.0	7.0	4.8	5.4
LP420	30.6	32.4	12.9	13.6	0.5	1.1	5.0	7.5	4.8	5.4

Lead material:0.15mm nominal thickness ;nickel. Insulating material:polyester tape.

Environmental Characteristics

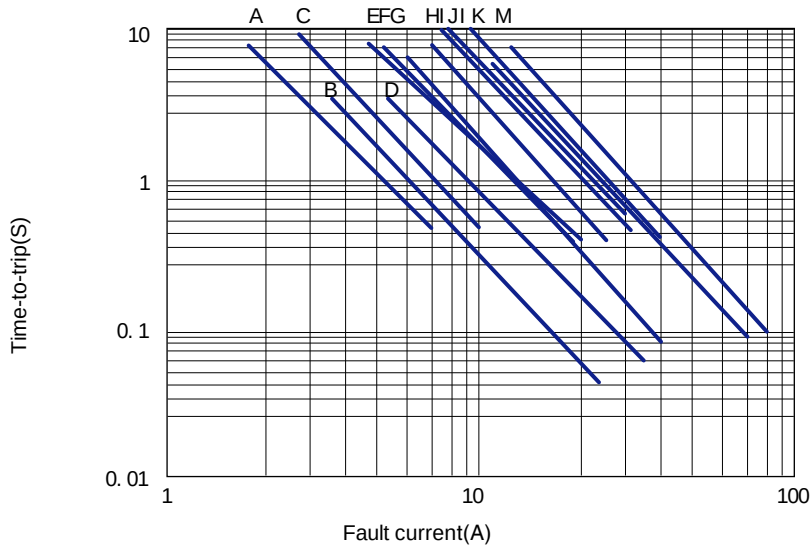
Operating/Storage Temperature.....-40℃to 85℃
Maximum Device Surface Temperature in Tripped State.....125℃
Passive Aging.....+70,1000hours.....±8% typical resistance change
Humidity Aging.....+85℃ ,85%R.H.1000hours.....±5% typical resistance change
Thermal Shock.....MIL-STD-202F,Method 107G.....±12% typical resistance change
125℃ to-40℃, 10times
Mechanical Shock.....MIL-STD-202F,Method 213.....No resistance change
Solvent Resistance.....MIL-STD-202F,Method 215.....No change
Vibration.....MIL-STD-883C,,Method 2007.1.....No change
Condition A

Test Procedures And Requirements

Test	Test Conditions	Accept/Reject Criteria
Resistance	In still air @ 25℃	Rmin≤R≤Rmax
Time to Trip	5 times I_h.,Vmax,25℃	T≤ max.time to trip(seconds)
Hold Current	30 min.at I_h	No trip
Trip Cycle Life	Vmax,Imax,100 cycles	No arcing or buring
Trip Endurance	Vmax,24 hours	No arcing or buring

Typical Time- to- Trip Charts at 25℃

A=LP070
B=LP100
C=LP120
D=LP175
E=LP180
F=LP190
G=LP200
H=LP260
I=LP300
J=LP310
K=LP340
L=LP350
M=LP420



Thermal Derating Chart- I_{hold} (Amps)

part number	Ambient operating temperatures(℃)								
	-40℃	-20℃	0℃	25℃	40℃	50℃	60℃	70℃	85℃
LP070	1. 32	1. 21	0. 99	0. 70	0. 63	0. 60	0. 50	0. 39	0. 26
LP100	2. 00	1. 73	1. 52	1. 00	0. 99	0. 85	0. 75	0. 61	0. 40
LP120	1. 95	1. 74	1. 54	1. 20	1. 07	0. 98	0. 87	0. 76	0. 58
LP175	2. 57	2. 36	2. 07	1. 75	1. 59	1. 39	1. 27	1. 18	0. 99
LP180	3. 23	2. 88	2. 35	1. 80	1. 48	1. 20	1. 10	0. 75	0. 45
LP190	3. 50	3. 00	2. 51	1. 90	1. 60	1. 35	1. 20	0. 88	0. 52
LP200	3. 28	2. 88	2. 59	2. 00	1. 81	1. 70	1. 52	1. 31	1. 02
LP260	4. 40	3. 80	3. 19	2. 60	2. 10	1. 80	1. 49	1. 19	0. 70
LP300	5. 20	4. 49	3. 78	3. 00	2. 39	2. 04	1. 70	1. 35	0. 78
LP310	5. 46	4. 68	3. 80	3. 10	2. 45	2. 11	1. 80	1. 40	0. 80
LP340	5. 60	4. 88	4. 10	3. 40	2. 70	2. 33	2. 00	1. 60	0. 89
LP350	5. 51	4. 89	4. 42	3. 50	3. 00	2. 89	2. 62	2. 28	1. 79
LP420	6. 53	5. 81	5. 20	4. 20	3. 69	3. 38	3. 10	2. 75	2. 24

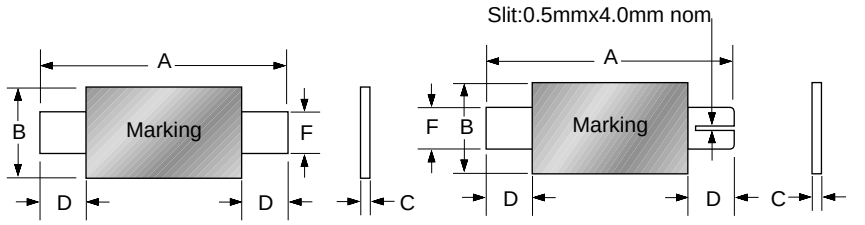
PPTC Resettable Fuse

SUNON

How to order

LP-CW_15__X__suffix

- Packaging option
- Hold current
- Voltage rating
- Product family



Top View Standard Style | Side View | Top View " S" Style | Side View

Packaging:

All moldels packged in bulk,500 pcs each.

Electrical characteristics25℃

part number	I_h (amps)	I_t (amps)	T_{trip} (seconds)	V_{max} (volts)	I_{max} (amps)	Pd_{typ} (watts)	Initial Resistance(ohms) R_{min}	R_{max}
LP-CW120	1.20	2.70	3.0	15	100	1.50	0.085	0.160
LP-CW170	1.70	3.40	3.0	15	100	1.80	0.030	0.052
LP-CW210	2.10	4.70	5.0	15	100	2.00	0.018	0.030

Product Dimensions(millimeters)

part number	A		B		C		D		F	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
LP-CW120	19.9	22.3	4.9	5.2	0.7	1.2	4.8	7.5	3.9	4.2
LP-CW170	15.4	17.6	7.2	7.6	0.6	1.0	4.1	5.8	3.9	4.2
LP-CW210	20.9	23.1	4.9	5.3	0.6	1.0	4.1	5.8	3.9	4.2

Environmental Characteristics

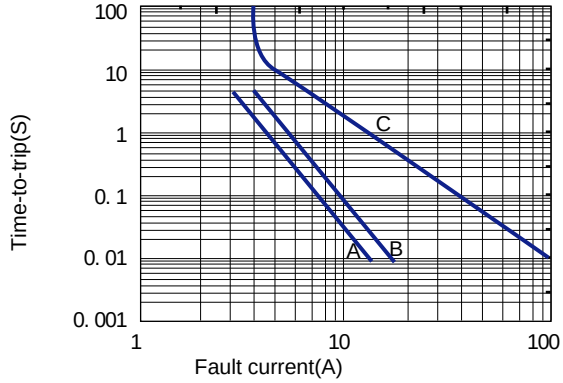
Operating/Storage Temperature.....-40℃ to 60℃
Maximum Device Surface Temperature in Tripped State.....85℃
Passive Aging.....+40,1000hours.....±10% typical resistance change
Humidity Aging.....+40℃,90%R.H.1000hours.....±10% typical resistance change
Thermal Shock.....85℃ to-40℃10times.....±10% typical resistance change
Mechanical Shock.....MIL-STD-202F,Method 213.....No resistance change
Solvent Resistance.....MIL-STD-202F,Method 215.....No change
Vibration.....MIL-STD-883C,Method 2007.1 conditionA.....No change

Test Procedures And Requirements

Test	Test Conditions	Accept/Reject Criteria
Resistance	In still air @ 25℃	Rmin≤R≤Rmax
Time to Trip	5 times I_h.,Vmax,25℃	T≤max.time to trip(seconds)
Hold Current	30 min.at I_h	No trip
Trip Cycle Life	Vmax,Imax,100 cycles	No arcing or buring
Trip Endurance	Vmax,24 hours	No arcing or buring

Typical Time- to- Trip Charts at 25℃

A=LP-CW120
B=LP-CW170
C=LP-CW210



T_{trip} = Maximum time to trip at 5*I_h
*Lead material: 0.15mm nominal thickness;nickel
Insulating material: Polyester tape