

LP-MSM *series*

Surface-mount devices

Features

- ✧ Very small size of 1812/4420
- ✧ Fast tripping resettable circuit protection
- ✧ Surface mount packaging for automated assembly
- ✧ Agency recognition: UL、CSA、TUV



Applications:

- Computer
- Portable electronics
- Multimedia
- Game machines
- Telephony and broadband
- Mobile phones
- Automotive
- Industrial controls
- Battery

Product Dimensions in Millimeters(Inches)

Size 4532mm/1812 mils

Part number	A Max.	B Max.	C Max.	D Min.	E Min.	Figures for Dimension
LP-MSM010	4.73(0.186)	3.41(0.134)	1.00(0.039)	0.30(0.012)	0.30(0.012)	S2
LP-MSM014	4.73(0.186)	3.41(0.134)	1.00(0.039)	0.30(0.012)	0.30(0.012)	S2
LP-MSM020	4.73(0.186)	3.41(0.134)	1.00(0.039)	0.30(0.012)	0.30(0.012)	S2
LP-MSM050	4.73(0.186)	3.41(0.134)	1.00(0.039)	0.30(0.012)	0.30(0.012)	S2
LP-MSM075	4.73(0.186)	3.41(0.134)	1.00(0.039)	0.30(0.012)	0.30(0.012)	S2
LP-MSM110	4.73(0.186)	3.41(0.134)	1.00(0.039)	0.30(0.012)	0.30(0.012)	S2
LP-MSM125	4.73(0.186)	3.41(0.134)	1.00(0.039)	0.30(0.012)	0.30(0.012)	S2
LP-MSM150	4.73(0.186)	3.41(0.134)	1.00(0.039)	0.30(0.012)	0.30(0.012)	S2
LP-MSM160	4.73(0.186)	3.41(0.134)	1.00(0.039)	0.30(0.012)	0.30(0.012)	S2
LP-MSM200	4.73(0.186)	3.41(0.134)	1.00(0.039)	0.30(0.012)	0.30(0.012)	S2
LP-MSM260	4.73(0.186)	3.41(0.134)	1.00(0.039)	0.30(0.012)	0.30(0.012)	S2
LP-MSM050/24	4.73(0.186)	3.41(0.134)	1.00(0.039)	0.30(0.012)	0.30(0.012)	S2
LP-MSM075/24	4.73(0.186)	3.41(0.134)	1.00(0.039)	0.30(0.012)	0.30(0.012)	S2
LP-MSM110/24	4.73(0.186)	3.41(0.134)	1.00(0.039)	0.30(0.012)	0.30(0.012)	S2
LP-MSM125/24	4.73(0.186)	3.41(0.134)	1.00(0.039)	0.30(0.012)	0.30(0.012)	S2
LP-MSM150/24	4.73(0.186)	3.41(0.134)	1.00(0.039)	0.30(0.012)	0.30(0.012)	S2
LP-MSM160/24	4.73(0.186)	3.41(0.134)	1.00(0.039)	0.30(0.012)	0.30(0.012)	S2
LP-MSM200/24	4.73(0.186)	3.41(0.134)	1.00(0.039)	0.30(0.012)	0.30(0.012)	S2
LP-MSM260/24	4.73(0.186)	3.41(0.134)	1.00(0.039)	0.30(0.012)	0.30(0.012)	S2

Size 11550mm/4420 mils

Part number	A Max.	B Max.	C Max.	D Min.	E Min.	Figures for Dimension
LP-MSM190	12.00(0.472)	5.33(0.210)	0.55(0.022)	0.30(0.012)		S4

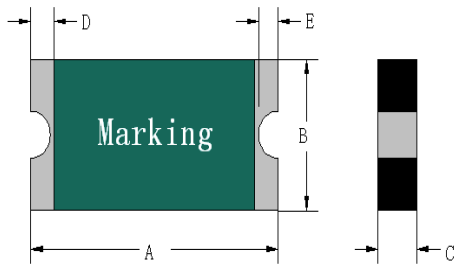


Figure S2

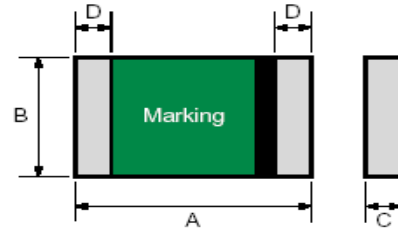


Figure S4

Electrical Characteristic

Size 4532mm/1812 mils

Part number	I_H	I_T	V_{max}	I_{max}	T_{trip}		R_{min}	R_{1max}
	(A)	(A)	(V)	(A)	Current (A)	Time(S)	(Ω)	(Ω)
LP-MSM010	0.10	0.20	60	10	1.5	0.15	0.700	6.000
LP-MSM014	0.14	0.34	60	10	1.5	0.15	0.700	6.000
LP-MSM020	0.20	0.40	30	10	6.0	0.02	0.600	5.000
LP-MSM050	0.50	1.00	15	40	8.0	0.15	0.150	1.000
LP-MSM075	0.75	1.50	13.2	40	8.0	0.20	0.100	0.480
LP-MSM110	1.10	2.20	6	40	8.0	0.30	0.040	0.260
LP-MSM125	1.25	2.50	6	40	8.0	0.40	0.070	0.250
LP-MSM150	1.50	3.00	6	40	8.0	0.50	0.040	0.110
LP-MSM160	1.60	3.20	6	40	8.0	1.00	0.030	0.100
LP-MSM200	2.00	3.50	6	40	8.0	2.00	0.020	0.075
LP-MSM260	2.60	5.20	6	40	8.0	2.50	0.015	0.047
LP-MSM050/24	0.50	1.00	24	40	8.0	0.15	0.150	1.000
LP-MSM075/24	0.75	1.50	24	40	8.0	0.20	0.100	0.480
LP-MSM110/24	1.10	2.20	24	40	8.0	0.30	0.040	0.260
LP-MSM125/24	1.25	2.50	24	40	8.0	0.40	0.070	0.250
LP-MSM150/24	1.50	3.00	24	40	8.0	0.50	0.040	0.110
LP-MSM160/24	1.60	3.20	24	40	8.0	1.00	0.030	0.100
LP-MSM200/24	2.00	3.50	24	40	8.0	2.00	0.020	0.075
LP-MSM260/24	2.60	5.20	24	40	8.0	2.50	0.015	0.047

Size 11550mm/4420 mils

Part number	I_H	I_T	V_{max}	I_{max}	T_{trip}		R_{min}	R_{1max}
	(A)	(A)	(V)	(A)	Current (A)	Time(S)	(Ω)	(Ω)
LP-MSM190	1.90	3.80	16	100	10.0	2.00	0.024	0.080

I_H =Hold current: maximum current at which the device will not trip at 25°C still air.

I_T =Trip current: minimum current at which the device will always trip at 25°C 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.

T_{trip} =Maximum time to trip(s) at assigned current.

R_{min} =Minimum device resistance at 25°C prior to tripping.

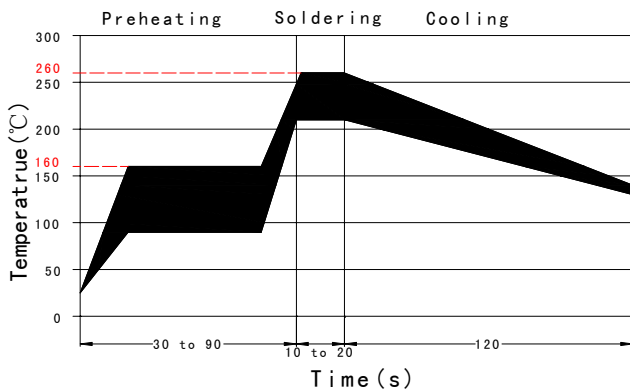
R_{1max} =Maximum device resistance measured in the nontripped state 1 hour post reflow.

Test Procedures And Requirements

Test	Test Conditions	Accept/Reject Criteria
Resistance	In still air @ 25°C	$R_{min} \leq R \leq R_{max}$

Time to Trip	Specified current, V_{max} , 25°C	$T \leq$ maximum Time to Trip
Hold Current	30min, at I_H	No trip
Trip Cycle Life	V_{max} , I_{max} , 100cycles	No arcing or burning
Trip Endurance	V_{max} , 24hours	No arcing or burning

Solder Reflow Recommendations



Solder Pad Layouts

Part number	A	B	C
	(mm)	(mm)	(mm)
LP-MSM010	3.45	1.78	3.15
LP-MSM014	3.45	1.78	3.15
LP-MSM020	3.45	1.78	3.15
LP-MSM050	3.45	1.78	3.15
LP-MSM075	3.45	1.78	3.15
LP-MSM110	3.45	1.78	3.15
LP-MSM125	3.45	1.78	3.15
LP-MSM150	3.45	1.78	3.15
LP-MSM160	3.45	1.78	3.15
LP-MSM190	9.57	1.45	4.75
LP-MSM200	3.45	1.78	3.15
LP-MSM260	3.45	1.78	3.15
LP-MSM050/24	3.45	1.78	3.15
LP-MSM075/24	3.45	1.78	3.15
LP-MSM110/24	3.45	1.78	3.15
LP-MSM125/24	3.45	1.78	3.15
LP-MSM150/24	3.45	1.78	3.15
LP-MSM160/24	3.45	1.78	3.15
LP-MSM200/24	3.45	1.78	3.15
LP-MSM260/24	3.45	1.78	3.15

* Recommended reflow methods: IR, Vapor phase oven, hot air oven, wave solder.

* Devices can be cleaned using standard industry methods and solvents.

Note:

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

2 Devices are not designed to be wave soldered to the bottom side of the board.

Effectivity: Reference documents shall be the issue in effect on the date of invitation for bid.

Caution: Operation beyond the rated voltage or current may result in rupture electrical arcing or flame.

Thermal Derating Chart-I_H(A)

Part number	Maximum ambient operating temperatures(°C)								
	-40	-20	0	25	40	50	60	70	85
LP-MSM010	0.17	0.16	0.14	0.10	0.08	0.07	0.06	0.05	0.04
LP-MSM014	0.23	0.20	0.18	0.14	0.12	0.11	0.10	0.07	0.05
LP-MSM020	0.33	0.29	0.26	0.20	0.17	0.16	0.15	0.13	0.09
LP-MSM050	0.76	0.69	0.61	0.50	0.45	0.40	0.36	0.33	0.23
LP-MSM075	1.11	1.02	0.89	0.75	0.65	0.59	0.54	0.47	0.38
LP-MSM110	1.65	1.50	1.32	1.10	0.99	0.85	0.78	0.68	0.52
LP-MSM125	1.89	1.64	1.41	1.25	1.09	0.98	0.86	0.74	0.56
LP-MSM150	2.28	2.05	1.85	1.50	1.26	1.14	1.05	0.92	0.73
LP-MSM160	2.45	2.15	1.89	1.60	1.34	1.25	1.15	0.96	0.79
LP-MSM190	3.15	2.75	2.21	1.90	1.50	1.25	1.12	0.82	0.37
LP-MSM200	2.90	2.61	2.40	2.00	1.70	1.51	1.41	1.21	0.95
LP-MSM260	3.80	3.61	3.12	2.60	2.28	2.10	1.85	1.61	1.29
LP-MSM050/24	0.78	0.69	0.59	0.50	0.48	0.41	0.37	0.33	0.23
LP-MSM075/24	1.12	1.02	0.89	0.75	0.66	0.58	0.53	0.47	0.39
LP-MSM110/24	1.65	1.49	1.29	1.10	0.95	0.85	0.79	0.66	0.53
LP-MSM125/24	1.89	1.69	1.46	1.25	1.09	0.95	0.89	0.76	0.59
LP-MSM150/24	2.25	2.04	1.80	1.50	1.30	1.15	1.03	0.92	0.73
LP-MSM160/24	2.50	2.20	1.89	1.60	1.40	1.25	1.13	0.99	0.79
LP-MSM200/24	2.91	2.65	2.41	2.00	1.75	1.65	1.45	1.28	1.05
LP-MSM260/24	3.75	3.45	3.08	2.60	2.35	2.10	1.84	1.62	1.26

Typical Time-to-trip Curves at 25°C

LP-MSM Series

A = LP-MSM010,LP-MSM014

B = LP-MSM020

C = LP-MSM050,LP-MSM050/24

D = LP-MSM075,LP-MSM075/24

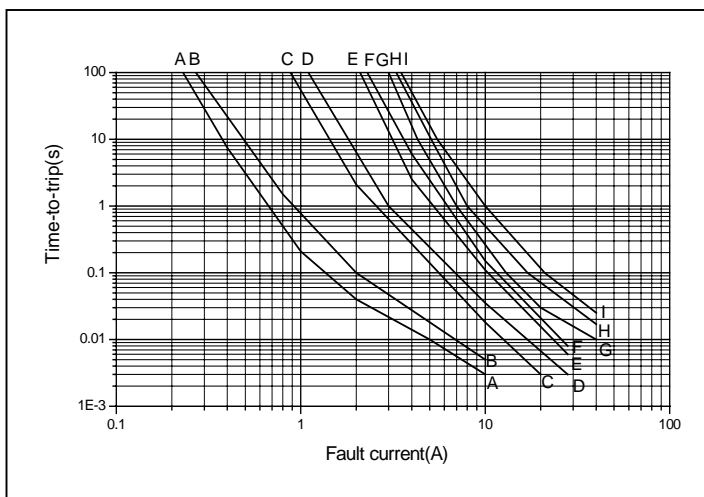
E = LP-MSM110,LP-MSM110/24,
LP-MSM125,LP-MSM125/24

F = LP-MSM150,LP-MSM150/24,
LP-MSM160,LP-MSM160/24

G = LP-MSM200,LP-MSM200/24

H = LP-MSM190

I = LP-MSM260,LP-MSM260/24



Packaging and Marking Information

Size 4532mm/1812 mils

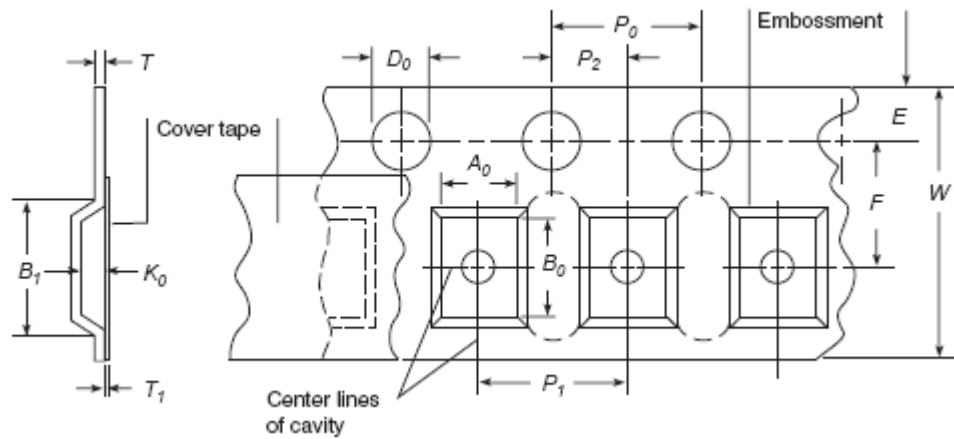
Part number	Tape & Reel		Part	Recommended Pad Layout Figures[mm(In.)]			Agency Recognition
	Quantity	Tape spc code		Marking	Dimension A(Nom.)	Dimension B(Nom.)	
LP-MSM010	2000	1812A	W010	3.45(0.141)	1.78(0.071)	3.15(0.121)	UL,CSA,TUV
LP-MSM014	2000	1812A	W014	3.45(0.141)	1.78(0.071)	3.15(0.121)	UL,CSA,TUV
LP-MSM020	2000	1812A	W020	3.45(0.141)	1.78(0.071)	3.15(0.121)	UL,CSA,TUV
LP-MSM050	2000	1812A	W050	3.45(0.141)	1.78(0.071)	3.15(0.121)	UL,CSA,TUV
LP-MSM075	2000	1812A	W075	3.45(0.141)	1.78(0.071)	3.15(0.121)	UL,CSA,TUV
LP-MSM110	2000	1812A	W110	3.45(0.141)	1.78(0.071)	3.15(0.121)	UL,CSA,TUV
LP-MSM125	2000	1812A	W125	3.45(0.141)	1.78(0.071)	3.15(0.121)	UL,CSA,TUV
LP-MSM150	2000	1812A	W150	3.45(0.141)	1.78(0.071)	3.15(0.121)	UL,CSA,TUV
LP-MSM160	2000	1812A	W160	3.45(0.141)	1.78(0.071)	3.15(0.121)	UL,CSA,TUV
LP-MSM200	2000	1812A	W200	3.45(0.141)	1.78(0.071)	3.15(0.121)	UL,CSA,TUV
LP-MSM260	1500	1812B	W260	3.45(0.141)	1.78(0.071)	3.15(0.121)	UL,CSA,TUV
LP-MSM050/24	2000	1812A	W050	3.45(0.141)	1.78(0.071)	3.15(0.121)	TUV
LP-MSM075/24	2000	1812A	W075	3.45(0.141)	1.78(0.071)	3.15(0.121)	TUV
LP-MSM110/24	2000	1812A	W110	3.45(0.141)	1.78(0.071)	3.15(0.121)	TUV
LP-MSM125/24	2000	1812A	W125	3.45(0.141)	1.78(0.071)	3.15(0.121)	TUV
LP-MSM150/24	1500	1812B	W150	3.45(0.141)	1.78(0.071)	3.15(0.121)	TUV
LP-MSM160/24	1500	1812B	W160	3.45(0.141)	1.78(0.071)	3.15(0.121)	TUV
LP-MSM200/24	1500	1812B	W200	3.45(0.141)	1.78(0.071)	3.15(0.121)	TUV
LP-MSM260/24	1500	1812B	W260	3.45(0.141)	1.78(0.071)	3.15(0.121)	TUV

Size 11550mm/4420 mils

Part number	Tape & Reel		Part	Recommended Pad Layout Figures[mm(In.)]			Agency Recognition
	Quantity	Tape spc code		Marking	Dimension A(Nom.)	Dimension B(Nom.)	
LP-MSM190	1000		W190	9.57(0.381)	1.45(0.061)	4.75(0.191)	UL,CSA,TUV

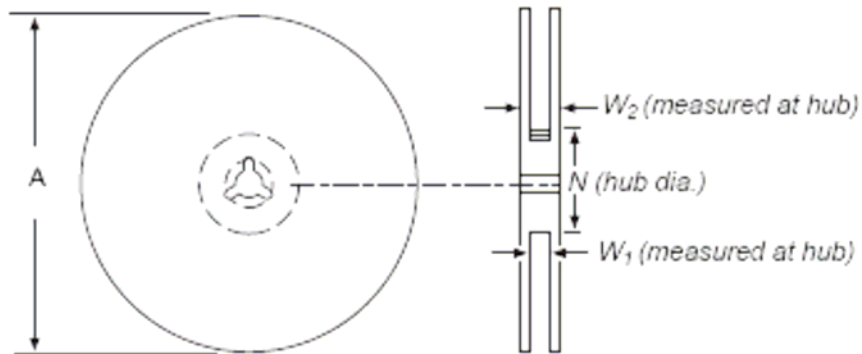
Tape Specification And Reel Dimensions

Tape spc code	W	P0	P1	P2	A	B	D	F	E	T	K
1812(A)	12.0±	4.00±	8.00±	2.00±	3.55±	4.90	1.55	5.50±	1.75±	0.25±	0.80±
	0.30	0.10	0.10	0.05	0.10	±	±	0.10	0.10	0.05	0.10
1812(B)	12.0±	4.00±	8.00±	2.00±	3.55±	4.90	1.55	5.50±	1.75±	0.25±	1.25±
	0.30	0.10	0.10	0.05	0.10	±	±	0.10	0.10	0.05	0.10



Reel Dimensions

Tape spc code	A	N	W1	W2
1812(A)	180+0/-1.5	60+1/-0	13.0+1/-0	15.4+1/-0
1812(B)	180+0/-1.5	60+1/-0	13.0+1/-0	15.4+1/-0



Storage

The maximum ambient temperature shall not exceed 40°C. Storage temperatures higher than 40°C could result in the deformation of packaging materials. The maximum relative humidity recommended for storage is 70%. High humidity with high temperature can accelerate the oxidation of the solder plating on the termination and reduce the solderability of the components. Sealed plastic bags with desiccant shall be used to reduce the oxidation of the termination and shall only be opened prior to use. The products shall not be stored in areas where harmful gases containing sulfur or chlorine are present.

**WARNING:**

- Operation beyond the maximum ratings or improper use may result in device damage and possible electrical arcing and flame.
- The devices are intended for protection against occasional overcurrent or overtemperature fault conditions and should not be used when repeated fault conditions or prolonged trip events are anticipated.
- Contamination of the PPTC material with certain silicon based oils or some aggressive solvents can adversely impact the performance of the devices.
- Device performance can be impacted negatively if devices are handled in a manner inconsistent with recommended electronic, thermal and mechanical procedures for electronic components.
- Operation in circuit with a large inductance can generate a circuit voltage ($L di/dt$) above the rated voltage of the PolySwitch resettable device.