

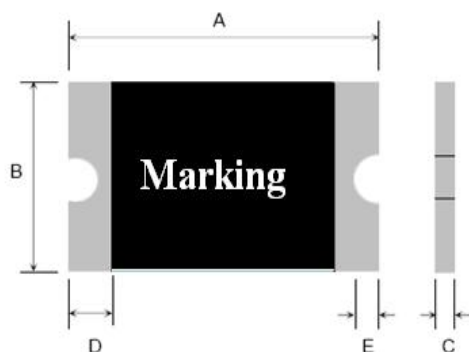
Surface Mountable PTC Resettable Fuse: LB-mSMD Series

Features:

- ✧ RoHS Compliant & Halogen Free
- ✧ faster tripping, 1812 Dimension, Surface mountable, Solid state
- ✧ Operation Current: 0.10A~3.50A
- ✧ Maximum Voltage: 6V~60Vdc
- ✧ Operating Temperature: -40℃ TO 85℃
- ✧ Agency recognition:UL



Product Dimensions



Pig.1

Terminal pad materials :Tin-Plated Nickle-copper
Terminal pad solderability : Meets EIA specification
RS 186-9E and ANSI/J-STD-002 Category 3.

Unit : mm

Model No.	Marking on sample	A		B		C		D	E
		Min	Max	Min	Max	Min	Max	Min	Min
LB-mSMD010	JK010	4.37	4.73	3.07	3.41	0.50	1.00	0.30	0.15
LB-mSMD010-60	JK010	4.37	4.73	3.07	3.41	0.50	1.00	0.30	0.15
LB-mSMD014-33	JK014	4.37	4.73	3.07	3.41	0.50	1.00	0.30	0.15
LB-mSMD014	JK014	4.37	4.73	3.07	3.41	0.50	1.10	0.30	0.15
LB-mSMD020	JK020	4.37	4.73	3.07	3.41	0.50	1.00	0.30	0.15

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Specifications are subject to change without notice !

Model No.	Marking on sample	A		B		C		D	E
		Min	Max	Min	Max	Min	Max	Min	Min
LB-mSMD030	JK030	4.37	4.73	3.07	3.41	0.50	1.00	0.30	0.15
LB-mSMD050	JK050	4.37	4.73	3.07	3.41	0.40	0.90	0.30	0.15
LB-mSMD050-24	JK050	4.37	4.73	3.07	3.41	0.40	0.90	0.30	0.15
LB-mSMD050-30/60	JK050	4.37	4.73	3.07	3.41	0.40	1.00	0.30	0.15
LB-mSMD075	JK075	4.37	4.73	3.07	3.41	0.40	0.90	0.30	0.15
LB-mSMD075-24	JK075	4.37	4.73	3.07	3.41	0.50	1.20	0.30	0.15
LB-mSMD075-33	JK075	4.37	4.73	3.07	3.41	0.60	1.20	0.30	0.15
LB-mSMD110	JK110	4.37	4.73	3.07	3.41	0.40	0.90	0.30	0.15
LB-mSMD110-8	JK110	4.37	4.73	3.07	3.41	0.40	0.90	0.30	0.15
LB-mSMD110-24	JK110	4.37	4.73	3.07	3.41	0.60	1.30	0.30	0.15
LB-mSMD110-33	JK110	4.37	4.73	3.07	3.41	0.70	1.70	0.30	0.15
LB-mSMD125	JK125	4.37	4.73	3.07	3.41	0.50	1.20	0.30	0.15
LB-mSMD125-8	JK125	4.37	4.73	3.07	3.41	0.30	0.90	0.30	0.15
LB-mSMD150	JK150	4.37	4.73	3.07	3.41	0.30	0.90	0.30	0.15
LB-mSMD150-16	JK150	4.37	4.73	3.07	3.41	0.50	1.20	0.30	0.15
LB-mSMD150-24	JK150	4.37	4.73	3.07	3.41	0.80	1.70	0.30	0.15
LB-mSMD160	JK160	4.37	4.73	3.07	3.41	0.30	0.80	0.30	0.15
LB-mSMD200	JK200	4.37	4.73	3.07	3.41	0.40	1.20	0.30	0.15
LB-mSMD200-12	JK200	4.37	4.73	3.07	3.41	0.50	1.20	0.30	0.15
LB-mSMD200-16	JK200	4.37	4.73	3.07	3.41	0.50	1.20	0.30	0.15
LB-mSMD260	JK260	4.37	4.73	3.07	3.41	0.50	1.20	0.30	0.15
LB-mSMD260-12	JK260	4.37	4.73	3.07	3.41	0.60	1.50	0.30	0.15
LB-mSMD260-16	JK260	4.37	4.73	3.07	3.41	0.80	1.70	0.30	0.15

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Model No.	Marking on sample	A		B		C		D	E
		Min	Max	Min	Max	Min	Max	Min	Min
LB-mSMD300	JK300	4.37	4.73	3.07	3.41	0.50	1.50	0.30	0.15
LB-mSMD350	JK350	4.37	4.73	3.07	3.41	0.50	1.50	0.30	0.15

Thermal Derating Chart-IH (A)

Part number	Maximum ambient operating temperatures (°C)								
	-40	-20	0	25	40	50	60	70	85
LB-mSMD010	0.16	0.14	0.12	0.10	0.08	0.07	0.06	0.05	0.03
LB-mSMD014	0.23	0.19	0.17	0.14	0.12	0.10	0.09	0.08	0.06
LB-mSMD020	0.29	0.26	0.23	0.20	0.17	0.15	0.14	0.12	0.10
LB-mSMD030	0.44	0.39	0.35	0.30	0.26	0.23	0.21	0.18	0.15
LB-mSMD050	0.59	0.57	0.55	0.50	0.45	0.43	0.35	0.30	0.23
LB-mSMD075	1.10	0.99	0.87	0.75	0.63	0.57	0.49	0.45	0.35
LB-mSMD110	1.60	1.45	1.28	1.10	0.92	0.83	0.71	0.66	0.52
LB-mSMD110-8	1.60	1.45	1.28	1.10	0.92	0.83	0.71	0.66	0.52
LB-mSMD110-24	1.60	1.45	1.28	1.10	0.92	0.83	0.71	0.66	0.52
LB-mSMD110-33	1.60	1.45	1.28	1.10	0.92	0.83	0.71	0.66	0.52
LB-mSMD125	2.00	1.75	1.52	1.25	1.00	0.95	0.90	0.75	0.53
LB-mSMD125-8	2.00	1.75	1.52	1.25	1.00	0.95	0.90	0.75	0.53
LB-mSMD150	2.30	2.05	1.77	1.50	1.23	1.09	0.95	0.82	0.61
LB-mSMD150-16	2.30	2.05	1.77	1.50	1.23	1.09	0.95	0.82	0.61
LB-mSMD150-24	2.30	2.05	1.77	1.50	1.23	1.09	0.95	0.82	0.61
LB-mSMD160	2.45	2.15	1.89	1.60	1.34	1.25	1.15	0.96	0.79
LB-mSMD200	2.89	2.61	2.30	2.00	1.75	1.66	1.45	1.39	1.19
LB-mSMD200-12	2.89	2.61	2.30	2.00	1.75	1.66	1.45	1.39	1.19
LB-mSMD200-16	2.89	2.61	2.30	2.00	1.75	1.66	1.45	1.39	1.19
LB-mSMD260	3.76	3.39	2.99	2.60	2.28	2.16	1.89	1.81	1.55
LB-mSMD260-12	3.38	3.05	2.69	2.60	2.05	1.94	1.70	1.63	1.39
LB-mSMD260-16	3.38	3.05	2.69	2.60	2.05	1.94	1.70	1.63	1.39
LB-mSMD300	4.34	3.92	3.45	3.00	2.63	2.49	2.18	2.09	1.79
LB-mSMD350	5.06	4.57	4.03	3.50	3.06	2.91	2.54	2.43	2.08

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Electrical Characteristic

Model No.	Umax (Vdc)	Imax (A)	Ihold @25°C (A)	Itrip @25°C (A)	Time to trip		R25	
					Current	Time	R _{imin}	R _{1max}
					(A)	(Sec)	(Ω)	(Ω)
LB-mSMD010	30.0	100	0.10	0.30	0.5	1.50	0.750	15.000
LB-mSMD010-60	60.0	100	0.10	0.30	0.5	1.50	0.750	15.000
LB-mSMD014-33	33.0	100	0.14	0.34	1.5	0.15	0.650	6.000
LB-mSMD014	60.0	100	0.14	0.34	1.5	0.15	0.650	6.000
LB-mSMD020	30/60	100	0.20	0.40	8.0	0.02	0.350	5.000
LB-mSMD030	30.0	100	0.30	0.60	8.0	0.10	0.250	3.000
LB-mSMD050	15.0	100	0.50	1.00	8.0	0.15	0.150	1.000
LB-mSMD050-24	24.0	100	0.50	1.00	8.0	0.15	0.150	1.000
LB-mSMD050-30/60	30/60	100	0.50	1.00	8.0	0.15	0.150	1.000
LB-mSMD075	13.2	100	0.75	1.50	8.0	0.20	0.090	0.450
LB-mSMD075-24	24	100	0.75	1.50	8.0	0.20	0.090	0.450
LB-mSMD075-33	33	100	0.75	1.50	8.0	0.20	0.090	0.450
LB-mSMD110	16.0	100	1.10	2.20	8.0	0.30	0.050	0.250
LB-mSMD110-8	8.0	100	1.10	2.20	8.0	0.30	0.050	0.250
LB-mSMD110-24	24.0	100	1.10	2.20	8.0	0.30	0.050	0.250
LB-mSMD110-33	33.0	100	1.10	2.20	8.0	0.30	0.050	0.250
LB-mSMD125-8	8.0	100	1.25	2.50	8.0	0.40	0.050	0.200
LB-mSMD125	16.0	100	1.25	2.50	8.0	0.40	0.050	0.200
LB-mSMD150	8.0	100	1.50	3.00	8.0	0.50	0.040	0.160
LB-mSMD150-16	16.0	100	1.50	3.00	8.0	0.50	0.040	0.160
LB-mSMD150-24	24.0	100	1.50	3.00	8.0	0.50	0.040	0.160
LB-mSMD160	8.0	100	1.60	2.80	8.0	1.00	0.030	0.130
LB-mSMD200	8.0	100	2.00	4.00	8.0	2.00	0.020	0.100
LB-mSMD200-12	12.0	100	2.00	4.00	8.0	2.00	0.020	0.100
LB-mSMD200-16	16.0	100	2.00	4.00	8.0	2.00	0.020	0.100
LB-mSMD260	8.0	100	2.60	5.00	8.0	2.50	0.015	0.050
LB-mSMD260-12	12.0	100	2.60	5.00	8.0	2.50	0.015	0.060
LB-mSMD260-16	16.0	100	2.60	5.00	8.0	2.50	0.015	0.060
LB-mSMD300	6.0	100	3.00	5.00	8.0	4.00	0.012	0.040

Part Numbering System

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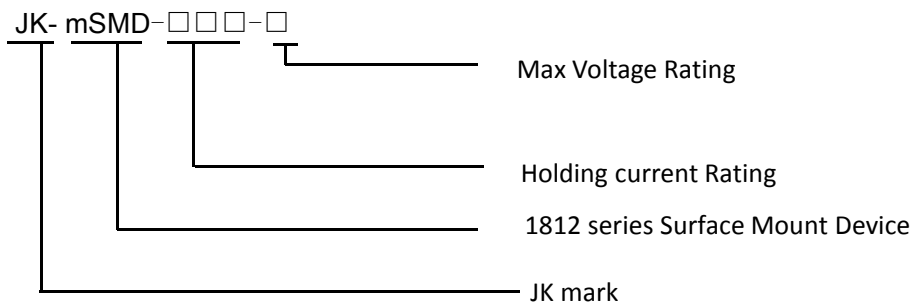
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Test Procedures And Requirements

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} , 1 hours	No arcing or burning

Physical Characteristics and Environmental Specifications

Physical Characteristics

Terminal materials :	Tin-Plated Nickle-copper	
Soldering zone	Meets EIA specification RS 186-9E and ANSI/J-STD-002 Category 3.	
Environmental Specifications		
Test	Conditions	Resistance Change
Passive aging	85°C,1000hours	±10%
Humidity aging	85°C/85%RH.1000 hours	±5%
Thermal shock	MIL-STD-202,Method 107G +85°C/-40°C,20times	-30% typical resistance change
Solvent Resistance	MIL-STD-202,Method 215	no change
Vibration	ML-STD-883C,Test Condition A	No chage

Electrical Specifications:

I_{hold} = Hold Current. Maximum current device will not trip in 25°C still air.

I_{trip} = Trip Current. Minimum current at which the device will always trip in 25°C still air.

V_{max} = Maximum operating voltage device can withstand without damage at rated current (I_{max}).

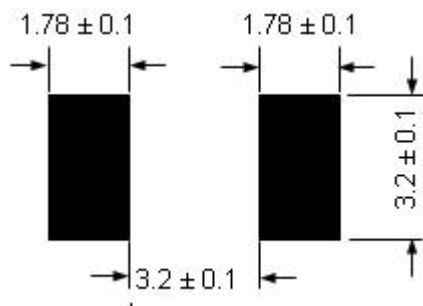
I_{max} = Maximum fault current device can withstand without damage at rated voltage (V_{max}).

P_d = Maximum power dissipation when device is in the tripped state in 25°C still air environment at rated voltage.

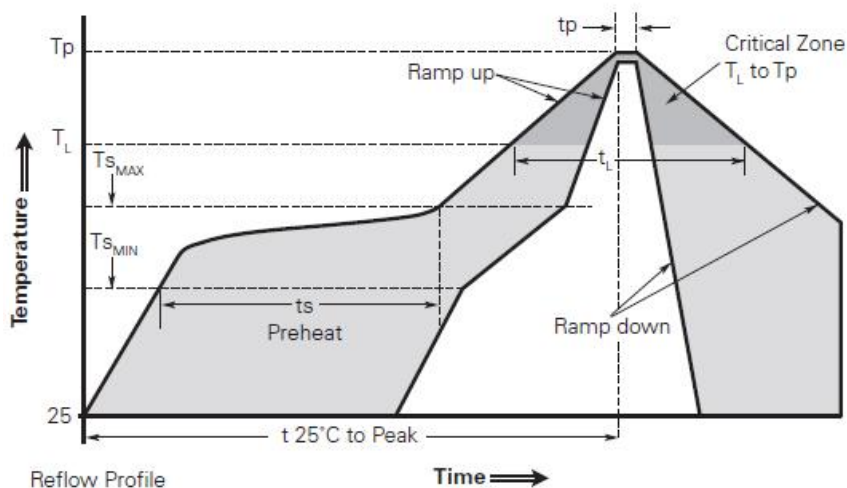
$R_{min/max}$ = Minimum/Maximum device resistance prior to tripping at 25°C.

$R1_{max}$ = Maximum device resistance is measured one hour post reflow.

Recommended pad layout (mm)



Solder reflow conditions



Profile Feature	Pb-Free Assembly
Average ramp up rate (Ts _{MAX} to Tp)	3°C/second max.
Preheat	
• Temperature min. (Ts _{MIN})	150°C
• Temperature max. (Ts _{MAX})	200°C
• Time (ts _{MIN} to ts _{MAX})	60-120 seconds
Time maintained above:	
• Temperature (T _L)	217°C
• Time (t _L)	60-150 seconds
Peak/Classification temperature (Tp)	260°C
Time within 5°C of actual peak temperature	
Time (tp)	30 seconds max.
Ramp down rate	3°C/second max.
Time 25°C to peak temperature	8 minutes max.

Note: All temperatures refer to topside of the package, measured on the package body surface.

- Recommended reflow methods: IR, vapor phase oven, hot air oven, N2 environment for lead-free.
- Devices are not designed to be wave soldered to the bottom side of the board.
- Recommended maximum paste thickness is 0.25mm (0.010inch).
- Devices can be cleaned using standard industry methods and solvents.
- Soldering temprature profile meets RoHs leadfree process.

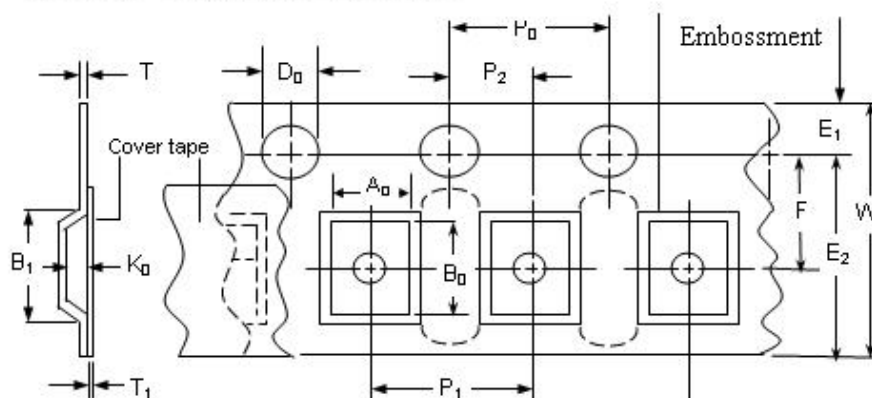
Notes: If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements

Tape Specification And Reel Dimensions

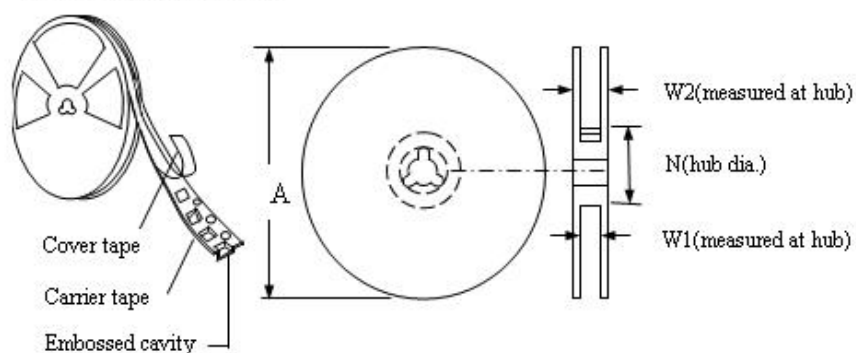
Covering Specifications EIA 481-1(Unit:mm)	
W	12.00+0.30/-0
P ₀	8.0 ± 0.10
P ₁	4.0± 0.10
P ₂	2.0 ± 0.10
A ₀	3.50 ± 0.10
B ₀	4.90 ± 0.10
D ₀	1.50+0.10/-0
F	5.50± 0.05
E ₁	1.75 ± 0.10
T	0.30± 0.10
Leader min.	390
Trailer min.	160
Reel Dimensions	

A	178±1.0
N	59±1
W ₁	8.5+1.0/-0.2
W ₂	12.0±1

EIA Tape Component Dimentions



EIA Reel Dimentions



Packaging Quantity

Part number	Quantity	Part number	Quantity
LB-mSMD010	1500	LB-mSMD110-33	1500
LB-mSMD010-60	1500	LB-mSMD125-8	2000
LB-mSMD014-33	1500	LB-mSMD125	1500
LB-mSMD014	1500	LB-mSMD150	2000
LB-mSMD020	1500	LB-mSMD150-16	1500
LB-mSMD030	1500	LB-mSMD150-24	1500
LB-mSMD050	2000	LB-mSMD160	2000
LB-mSMD050-24	2000	LB-mSMD200	2000
LB-mSMD050-30	2000	LB-mSMD200-12	1500
LB-mSMD075	2000	LB-mSMD200-16	1500
LB-mSMD075-24	2000	LB-mSMD260	1500
LB-mSMD075-33	1500	LB-mSMD260-12	1500
LB-mSMD110	2000	LB-mSMD260-16	1500

LB-mSMD110-8	2000	LB-mSMD300	1500
LB-mSMD110-24	1500		

Storage

The maximum ambient temperature shall not exceed 38℃. Storage temperatures higher than 38℃ could result in the deformation of packaging materials. The maximum relative humidity recommended for storage is 60%. 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

- Use PPTC beyond the maximum ratings or improper use may result in device damage and possible electrical arcing and flame.
- PPTC are intended for protection against occasional over current or over temperature fault conditions and should not be used when repeated fault conditions or prolonged trip events are anticipated.
- Device performance can be impacted negatively if devices are handled in a manner inconsistent with recommended electronic, thermal, and mechanical procedures for electronic components.
- Use PPTC with a large inductance in circuit will generate a circuit voltage ($L di/dt$) above the rated voltage of the PPTC.
- Avoid impact PPTC device its thermal expansion like placed under pressure or installed in limited space.
- Contamination of the PPTC material with certain silicon based oils or some aggressive solvents can adversely impact the performance of the devices. PPTC SMD can be cleaned by standard methods.
- Requests that customers comply with our recommended solder pad layouts and recommended reflow profile. Improper board layouts or reflow profile could negatively impact solderability performance of our devices.

Notes

The specification is intended to present application, product and technical data to assist the user in selecting PPTC circuit production devices. However, users should independently evaluate and test the suitability of each product. LB makes no warranties as to the accuracy or completeness of the information and disclaims any liability resulting from its use. LB's only obligations are those in the LB Standard Terms and Conditions of Sale and in no case will LB be liable for any incidental, indirect, or consequential damages arising from the sale, resale, or misuse of its products. LB reserves the right to change of update, without notice, any information contained in this specification.