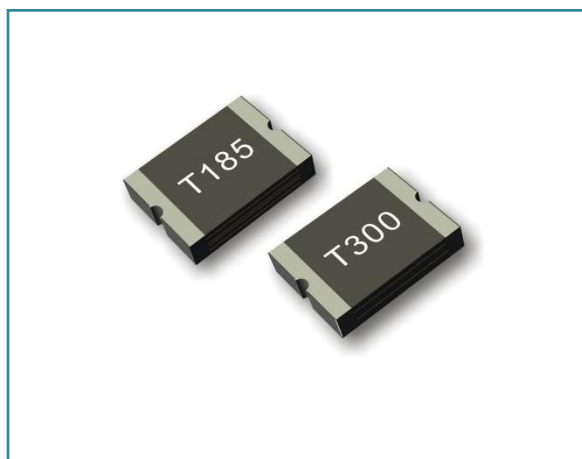


SMD Surface Mount 2920 Series





Applications

- Over current and over temperature protection of automotive electronics
- PC motherboards, Hard disk driver, and PC peripherals
- POS Equipment
- LCD / LED HDTV
- USB port protection
- HDMI source protection

Features

- Surface Mount Devices
- Standard 2920mils footprint
- Surface Mount packaging for automated assembly
- Compatible with Pb and Pb-free solder reflow profiles

Agency Approvals

AGENCY	AGENCY FILE NUMBER
	E352136
	/

Regulation/Standard



Electrical Characteristics

P/N	I _{hold} (A)	I _{trip} (A)	V _{max.} (V)	I _{max} (A)	Time To Trip		Pd _{typ} (W)	Resistance		Agency Approvals	
					Current (A)	Time (Sec.)		R _{min} (Ω)	R _{1max} (Ω)	UL/CSA	TUV
TLC-LSMD030	0.30	0.60	60	10	1.50	3.0	1.50	0.600	4.300	×	×
TLC-LSMD030/50	0.30	0.60	50	10	1.50	3.0	1.50	0.600	4.300	×	×
TLC-LSMD050	0.50	1.00	60	10	2.50	3.0	1.50	0.180	1.400	×	×
TLC-LSMD050/50	0.50	1.00	50	10	2.50	3.0	1.50	0.180	1.400	×	×
TLC-LSMD075	0.75	1.50	33	40	8.00	0.30	1.50	0.100	1.000	×	×
TLC-LSMD075/60	0.75	1.50	60	40	8.00	0.30	1.50	0.100	1.000	×	×
TLC-LSMD100	1.00	2.00	33	40	8.00	0.50	1.50	0.065	0.410	×	×
TLC-LSMD125	1.25	2.50	33	40	8.00	2.0	1.50	0.050	0.250	×	×
TLC-LSMD150	1.50	3.00	33	40	8.00	2.0	1.50	0.035	0.230	×	×
TLC-LSMD185	1.85	3.70	33	100	8.00	2.0	1.50	0.030	0.150	√	×
TLC-LSMD200	2.00	4.00	16	40	8.00	4.50	1.50	0.020	0.120	×	×
TLC-LSMD250	2.50	5.00	16	40	8.00	16.0	1.50	0.018	0.085	×	×
TLC-LSMD260	2.60	5.20	16	40	8.00	20.0	1.50	0.014	0.075	×	×
TLC-LSMD260D	2.60	5.20	24	100	8.00	18.0	1.50	0.014	0.075	√	×
TLC-LSMD300	3.00	6.00	12	40	8.00	25.0	1.50	0.010	0.055	×	×
TLC-LSMD300D	3.00	6.00	24	100	8.00	20.0	1.50	0.010	0.055	√	×
TLC-LSMD300D/16	3.00	6.00	16	40	8.00	25.0	1.50	0.010	0.055	×	×
TLC-LSMD400	4.00	8.00	16	40	20.0	5.00	1.50	0.007	0.035	×	×

TLC-LSMD450	4.50	9.00	16	40	22.5	5.00	1.50	0.005	0.020	×	×
TLC-LSMD500	5.00	10.00	16	40	25.0	5.00	1.50	0.005	0.022	×	×
TLC-LSMD500/8	5.00	10.00	8	40	25.0	5.00	1.50	0.005	0.018	×	×

I_{hold} : Holding Current: maximum current at which the device will not trip in 25°C still air.

I_{trip} : Tripping Current minimum current at which the device will trip in 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.

Time To Trip: Maximum time to trip(s) at assigned current.

Pd_{typ} : Rated working power.

R_{min} : Minimum resistance of device prior to trip at 25°C.

$R1_{max}$: Maximum resistance of device is measured one hours post reflow at 25°C.

Noted: All electrical function test is conducted after PCB mounted.

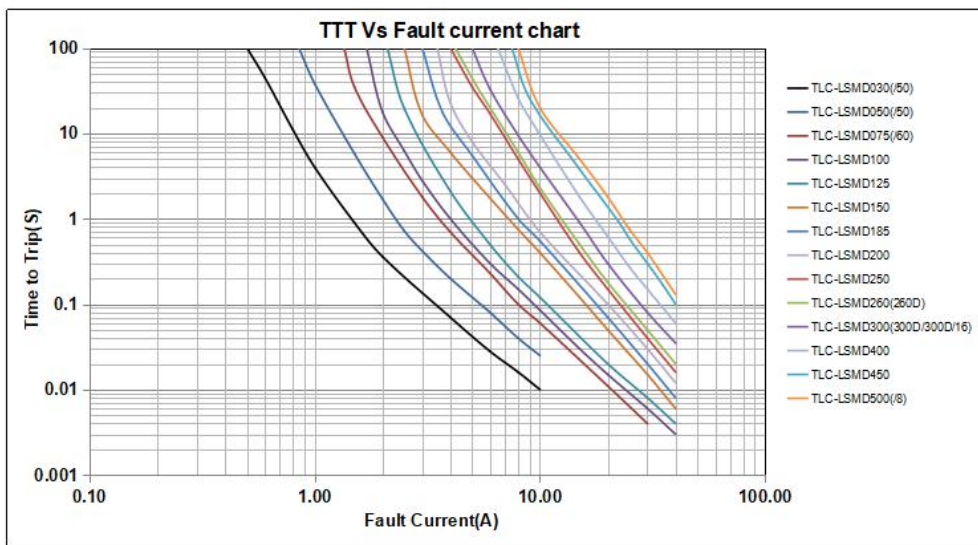
Thermal Derating Chart – I_{hold}/I_{trip} (Amps)

P/N	Test item	Ambient Operating Temperature								
		-40°C	-20°C	0°C	25°C	40°C	50°C	60°C	70°C	85°C
TLC-LSMD030	I-hold	0.45	0.40	0.35	0.30	0.25	0.23	0.20	0.17	0.14
	I-trip	0.90	0.80	0.70	0.60	0.50	0.46	0.40	0.34	0.28
TLC-LSMD030/50	I-hold	0.45	0.40	0.35	0.30	0.25	0.23	0.20	0.17	0.14
	I-trip	0.90	0.80	0.70	0.60	0.50	0.46	0.40	0.34	0.28
TLC-LSMD050	I-hold	0.76	0.67	0.59	0.50	0.42	0.38	0.33	0.29	0.23
	I-trip	1.52	1.34	1.18	1.00	0.84	0.76	0.66	0.58	0.46
TLC-LSMD050/50	I-hold	0.76	0.67	0.59	0.50	0.42	0.38	0.33	0.29	0.23
	I-trip	1.52	1.34	1.18	1.00	0.84	0.76	0.66	0.58	0.46
TLC-LSMD075	I-hold	1.13	1.01	0.88	0.75	0.62	0.56	0.50	0.44	0.34
	I-trip	2.26	2.02	1.76	1.50	1.24	1.12	1.00	0.88	0.68
TLC-LSMD075/60	I-hold	1.13	1.01	0.88	0.75	0.62	0.56	0.50	0.44	0.34
	I-trip	2.26	2.02	1.76	1.50	1.24	1.12	1.00	0.88	0.68
TLC-LSMD100	I-hold	1.66	1.47	1.29	1.00	0.91	0.83	0.73	0.64	0.50
	I-trip	3.32	2.94	2.58	2.00	1.82	1.66	1.46	1.28	1.00
TLC-LSMD125	I-hold	1.89	1.68	1.46	1.25	1.04	0.94	0.83	0.73	0.56
	I-trip	3.78	3.36	2.92	2.50	2.08	1.88	1.66	1.46	1.12
TLC-LSMD150	I-hold	2.27	2.01	1.76	1.50	1.25	1.13	1.00	0.87	0.74
	I-trip	4.54	4.02	3.52	3.00	2.50	2.26	2.00	1.74	1.48
TLC-LSMD185	I-hold	2.80	2.47	2.17	1.85	1.54	1.39	1.22	1.07	0.85
	I-trip	5.60	4.94	4.34	3.70	3.08	2.78	2.44	2.14	1.70
TLC-LSMD200	I-hold	3.02	2.68	2.34	2.00	1.80	1.70	1.54	1.40	1.30
	I-trip	6.04	5.36	4.68	4.00	3.60	3.40	3.08	2.80	2.60
TLC-LSMD250	I-hold	3.78	3.35	2.93	2.50	2.25	2.13	1.93	1.75	1.63
	I-trip	7.56	6.70	5.86	5.00	4.50	4.26	3.86	3.50	3.26
TLC-LSMD260	I-hold	3.93	3.48	3.04	2.60	2.34	2.21	2.00	1.82	1.69
	I-trip	7.86	6.96	6.08	5.20	4.68	4.42	4.00	3.64	3.38
TLC-LSMD260D	I-hold	3.93	3.48	3.04	2.60	2.34	2.21	2.00	1.82	1.69
	I-trip	7.86	6.96	6.08	5.20	4.68	4.42	4.00	3.64	3.38

TLC-LSMD300	I-hold	4.53	4.02	3.51	3.00	2.52	2.26	1.99	1.75	1.34
	I-trip	9.06	8.04	7.02	6.00	5.04	4.52	3.98	3.50	2.68
TLC-LSMD300D	I-hold	4.53	4.02	3.51	3.00	2.52	2.26	1.99	1.75	1.34
	I-trip	9.06	8.04	7.02	6.00	5.04	4.52	3.98	3.50	2.68
TLC-LSMD300D/16	I-hold	4.53	4.02	3.51	3.00	2.52	2.26	1.99	1.75	1.34
	I-trip	9.06	8.04	7.02	6.00	5.04	4.52	3.98	3.50	2.68
TLC-LSMD400	I-hold	6.04	5.36	4.68	4.00	3.60	3.40	3.08	2.80	2.60
	I-trip	12.08	10.72	9.36	8.00	7.20	6.80	6.16	5.60	5.20
TLC-LSMD450	I-hold	6.80	6.03	5.27	4.5	4.05	3.83	3.47	3.15	2.93
	I-trip	13.60	12.06	10.54	9.00	8.10	7.66	6.94	6.30	5.86
TLC-LSMD500	I-hold	7.56	6.70	5.86	5.00	4.50	4.26	3.86	3.50	3.26
	I-trip	15.12	13.40	11.72	10.00	9.00	8.52	7.72	7.00	6.52
TLC-LSMD500/8	I-hold	7.56	6.70	5.86	5.00	4.50	4.26	3.86	3.50	3.26
	I-trip	15.12	13.40	11.72	10.00	9.00	8.52	7.72	7.00	6.52

Notes: The temperature derating data is for reference only. Please contact TLC technical support for detail temperature derating information.

Typical time to trip at 25°C



Note: TLC-LSMD030(/50) is represented for TLC-LSMD030 and TLC-LSMD030/50, and so on.

Reliability Requirement

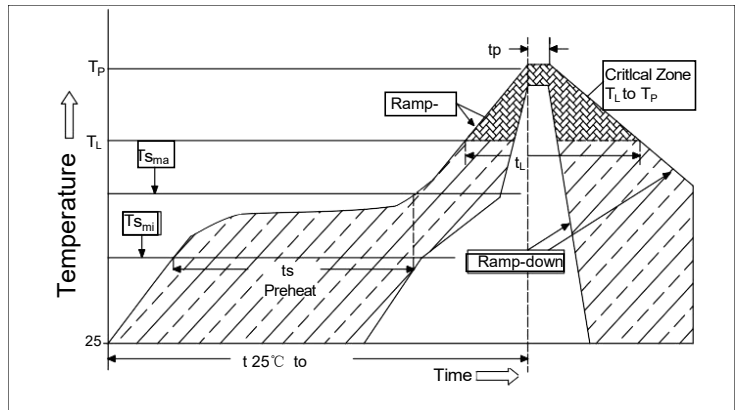
Humidity Aging	+85°C, 85% R.H., 1000 hours ±5% Typical Resistance Change
Passive Aging	+85°C, 1000 hours ±5% Typical Resistance Change
Thermal Shock	30min@-40°C~30min@85°C, 20cycles -33% Typical Resistance Change
Resistance to Solvents	MIL-STD-202, Method 215 Marking Still legible
Vibration	MIL-STD-833C, Method 2007.1, Condition A R min. < R i < R1max
Solderability	245°C±5°C, 5 Seconds >95% coverage

Environmental Characteristics

Operating/Storage Temperature -40 °C to +85 °C
 Maximum Device Surface Temperature in Tripped State 125 °C
 Storage Conditions+40 °C Max. 70% RH Max. Packed in original packaging.

Solder Reflow Conditions

Reflow Profile	Lead free
Heating rate from T _{smax} to T _p	Max.3°C/second
Pre-heat:	
T _{smin}	150°C
T _{smax}	200°C
T _{smin} to T _{smax}	60~180seconds
Soldering time:	>217°C
Temperature (T _L) Time (t _L)	60~150seconds
Peak temperature (T _p)	260°C
Time at Peak temperature ±5°C (t _p)	20~40seconds
Cooling rate	Max.6°C/second
Time from 25°C to Peak Temperature	8 minutes max

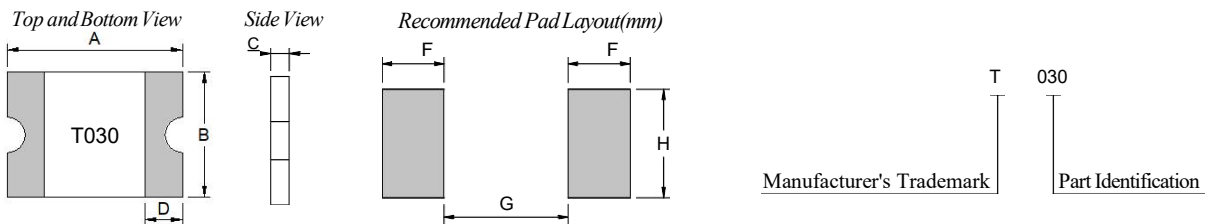


Warning for Reflow:

- 1、 The printed solder thickness is not over 0.25mm, Excess solder may cause a short circuit, especially during hand soldering
- 2、 If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements
- 3、 Device can not be wave soldered. Please contact TLC for hand soldering and dip soldering recommendations.
- 4、 Device can't contact solvent

Note: All temperature in top chart is measured on the surface of devices

Product Dimensions & Marking (Unit: mm)



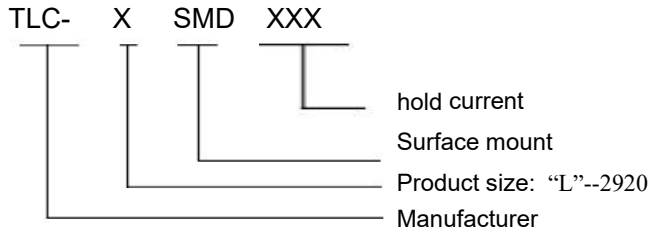
P/N	Marking	Device Dimension							Recommended Pad Layout(mm)		
		A		B		C		D	F	G	H
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Nor.	Nor.	Nor.
TLC-LSMD030	T030	6.73	7.98	4.80	5.44	0.75	1.25	0.30	2.00	4.60	5.30
TLC-LSMD030/50	T030	6.73	7.98	4.80	5.44	0.75	1.25	0.30	2.00	4.60	5.30
TLC-LSMD050	T050	6.73	7.98	4.80	5.44	0.75	1.25	0.30	2.00	4.60	5.30
TLC-LSMD050/50	T050	6.73	7.98	4.80	5.44	0.75	1.25	0.30	2.00	4.60	5.30
TLC-LSMD075	T075	6.73	7.98	4.80	5.44	0.65	1.05	0.30	2.00	4.60	5.30
TLC-LSMD075/60	T075	6.73	7.98	4.80	5.44	1.00	1.50	0.30	2.00	4.60	5.30

TLC-LSMD100	T100	6.73	7.98	4.80	5.44	0.65	1.05	0.30	2.00	4.60	5.30
TLC-LSMD125	T125	6.73	7.98	4.80	5.44	0.65	1.05	0.30	2.00	4.60	5.30
TLC-LSMD150	T150	6.73	7.98	4.80	5.44	0.90	1.30	0.30	2.00	4.60	5.30
TLC-LSMD185	T185	6.73	7.98	4.80	5.44	0.90	1.30	0.30	2.00	4.60	5.30
TLC-LSMD200	T200	6.73	7.98	4.80	5.44	0.45	0.85	0.30	2.00	4.60	5.30
TLC-LSMD250	T250	6.73	7.98	4.80	5.44	0.45	0.85	0.30	2.00	4.60	5.30
TLC-LSMD260	T260	6.73	7.98	4.80	5.44	0.45	0.85	0.30	2.00	4.60	5.30
TLC-LSMD260D	T260	6.73	7.98	4.80	5.44	1.10	1.60	0.30	2.00	4.60	5.30
TLC-LSMD300	T300	6.73	7.98	4.80	5.44	0.45	0.85	0.30	2.00	4.60	5.30
TLC-LSMD300D	T300	6.73	7.98	4.80	5.44	1.10	1.50	0.30	2.00	4.60	5.30
TLC-LSMD300D/16	T300	6.73	7.98	4.80	5.44	1.10	1.50	0.30	2.00	4.60	5.30
TLC-LSMD400	T400	6.73	7.98	4.80	5.44	1.10	1.50	0.30	2.00	4.60	5.30
TLC-LSMD450	T450	6.73	7.98	4.80	5.44	1.10	1.40	0.30	2.00	4.60	5.30
TLC-LSMD500	T500	6.73	7.98	4.80	5.44	1.00	1.40	0.30	2.00	4.60	5.30
TLC-LSMD500/8	T500	6.73	7.98	4.80	5.44	0.80	1.20	0.30	2.00	4.60	5.30

Packaging

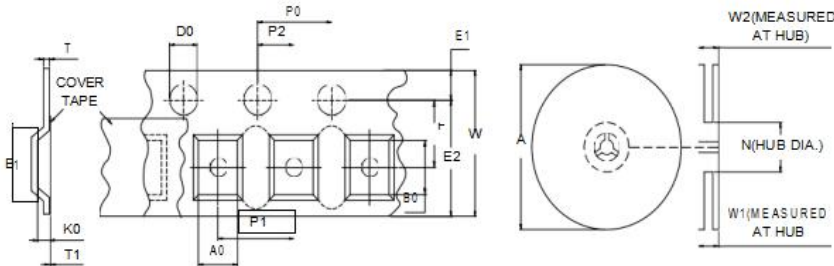
P/N	Product size	Packaging Option	Quantity
TLC-LSMD030	2920	Tape&Reel	1500
TLC-LSMD030/50	2920	Tape&Reel	1500
TLC-LSMD050	2920	Tape&Reel	1500
TLC-LSMD050/50	2920	Tape&Reel	1500
TLC-LSMD075	2920	Tape&Reel	1500
TLC-LSMD075/60	2920	Tape&Reel	1000
TLC-LSMD100	2920	Tape&Reel	1500
TLC-LSMD125	2920	Tape&Reel	1500
TLC-LSMD150	2920	Tape&Reel	1000
TLC-LSMD185	2920	Tape&Reel	1000
TLC-LSMD200	2920	Tape&Reel	1500
TLC-LSMD250	2920	Tape&Reel	2000
TLC-LSMD260	2920	Tape&Reel	2000
TLC-LSMD260D	2920	Tape&Reel	1000
TLC-LSMD300	2920	Tape&Reel	2000
TLC-LSMD300D	2920	Tape&Reel	1000
TLC-LSMD300D/16	2920	Tape&Reel	1000
TLC-LSMD400	2920	Tape&Reel	1000
TLC-LSMD450	2920	Tape&Reel	1000
TLC-LSMD500	2920	Tape&Reel	1000
TLC-LSMD500/8	2920	Tape&Reel	1000

Product Ordering Number System



Tape and Reel Specifications

Dimensions for 2920 size product (see table below)



	TLC-LSMD030	TLC-LSMD075/60	TLC-LSMD200
	TLC-LSMD030/50	TLC-LSMD150	TLC-LSMD250
	TLC-LSMD050	TLC-LSMD185	TLC-LSMD260
	TLC-LSMD050/50	TLC-LSMD260D	TLC-LSMD300
	TLC-LSMD075	TLC-LSMD300D	
	TLC-LSMD100	TLC-LSMD300D/16	
	TLC-LSMD125	TLC-LSMD400	
		TLC-LSMD450	
		TLC-LSMD500	
		TLC-LSMD500/8	
TAPE DIMENSIONS: EIA-481-2(mm)			
W	16.0±0.10	16.0±0.10	16.0±0.10
P0	4.00±0.10	4.00±0.10	4.00±0.10
P1	8.00±0.10	8.00±0.10	8.00±0.10
P2	2.00±0.10	2.00±0.10	2.00±0.10
A0	5.70±0.10	5.70±0.10	5.70±0.10
B0	8.00±0.10	8.00±0.10	8.00±0.10
B1max	9.50	9.50	9.50
D0	1.50+0.10/-0.00	1.50+0.10/-0.00	1.50+0.10/-0.00
F	7.50±0.10	7.50±0.10	7.50±0.10
E1	1.75±0.10	1.75±0.10	1.75±0.10
E2min	14.25	14.25	14.25
T max	0.35	0.35	0.35
T1min	0.10	0.10	0.10
K0	1.10±0.10	1.50±0.10	0.90±0.10
Leader min	390		
Trailer min	160		
Reel Dimensions: EIA-481-2(mm)			
A max	185		
N min	50		
W1	17.0±0.30		
W2 max	20.1		

Cautions for SMD PPTC Use

1. Operation beyond the rated maximum voltage or current may result in device damage and possible electrical arcing or flame.
2. Hold current at all temperatures specified in the SPEC is the conventional performance of PTC obtained by one time reflow welding. PTC can hold 1 hour under current conditions at a given temperature. This current is not the condition of long-term charging or discharging current for this type of PTC.
3. The above parameters are concluded from one time of reflow soldering processing the PTC. If there is any further heat generated process like injection or dispensing at the customer's premise, the aforementioned parameters will decrease at certain degree. Therefore the verification test to be conducted is necessary.
4. The PTC is thermal sensitive device. It is recommended not to design any heat source devices around it to reduce the outside heat source impact.
5. SMD PTC is designed for SMT processing which applies reflow soldering. Please refer to the recommended solder reflow curve. If the reflow soldering temperature exceeds the recommended value, the PTC might be damaged. Hand welding PTC is prohibited. Heat gun is not allowed to use during the circuit board components or terminals rework .
6. Please do not smash, clamp, pull, dent or twist by tool during assembling process otherwise it might be a cause of the performance degradation.
7. PTC is resettable protection device which shall not be taken for use as switch. Multiple times tripping shall lower the PTC hold current.
8. In the process of PTC processing, if there is soldering iron welding process, it is suggested that the welding position should be more than 1.5mm away from PTC, the welding tool temperature should be lower than 350 °C, and the contact time between soldering iron and solder joint should not exceed 3sec.