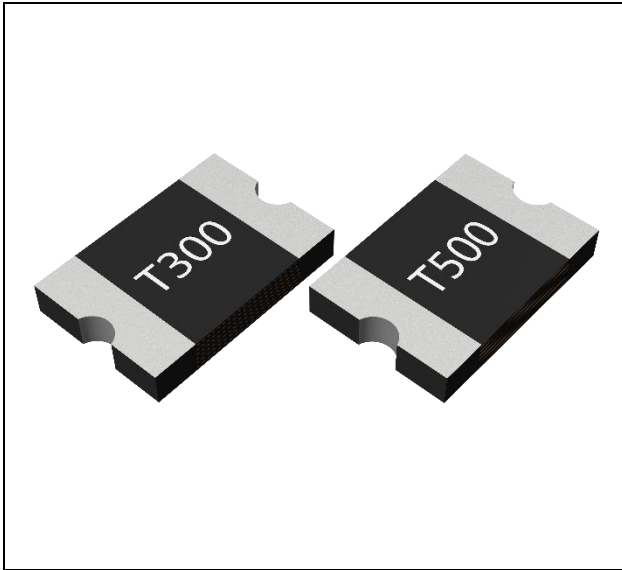




PPTC SMD Surface Mount 2920 Series

Revision: B



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



Regulation/Standard



Features

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

Agency Approvals

AGENCY	AGENCY FILE NUMBER
	E352136
	R 50505989

Electrical Characteristics

P/N	I_{hold} (A)	I_{trip} (A)	V_{max} (V)	I_{max} (A)	Time To Trip		P_d 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-LSMD100/60	1.00	2.00	60	100	8.00	0.50	1.50	0.090	0.410	×	√
TLC-LSMD110	1.10	2.20	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-LSMD200/24	2.00	4.00	24	40	8.00	4.50	1.50	0.020	0.120	√	√
TLC-LSMD200/33	2.00	4.00	33	40	8.00	4.50	1.50	0.020	0.125	×	√
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-LSMD260/33	2.60	5.20	33	40	8.00	18.0	1.50	0.010	0.075	×	×
TLC-LSMD300	3.00	6.00	12	40	8.00	25.0	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-LSMD300D	3.00	6.00	24	100	8.00	20.0	1.50	0.010	0.055	√	√
TLC-LSMD300/30	3.00	6.00	30	40	8.00	25.0	1.50	0.010	0.055	×	√
TLC-LSMD300/33	3.00	6.00	33	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.

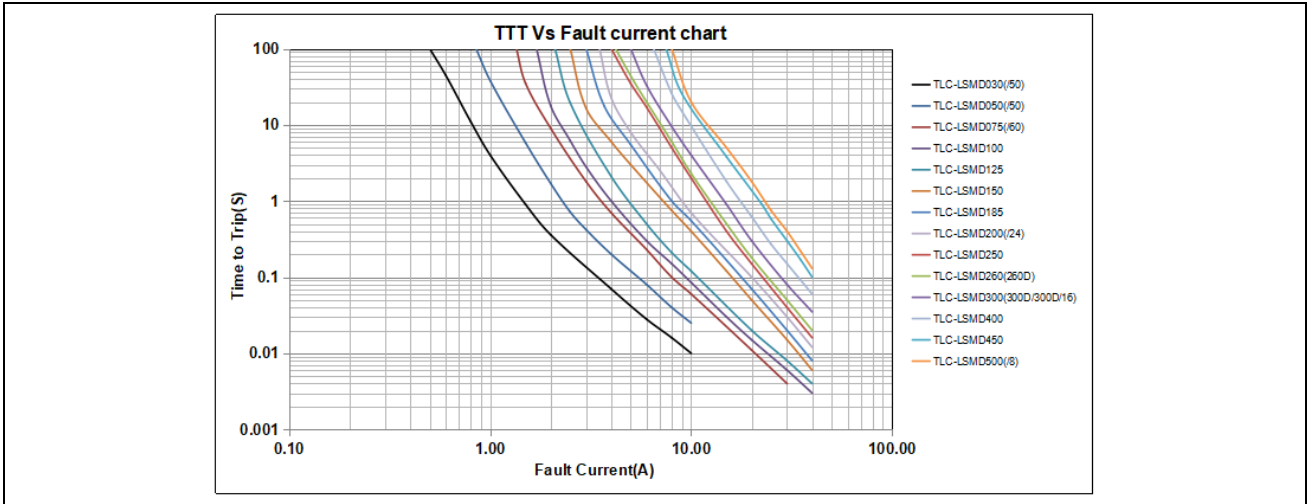
Thermal Derating Chart – I_{hold}/I_{trip} (Amps)

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-LSMD100/60	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-LSMD110	I-hold	1.75	1.56	1.38	1.10	0.98	0.91	0.81	0.73	0.61
	I-trip	3.50	3.12	2.76	2.20	1.96	1.82	1.62	1.46	1.22
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-LSMD200/24	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-LSMD200/33	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-LSMD260/33	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/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-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-LSMD300/30	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-LSMD300/33	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

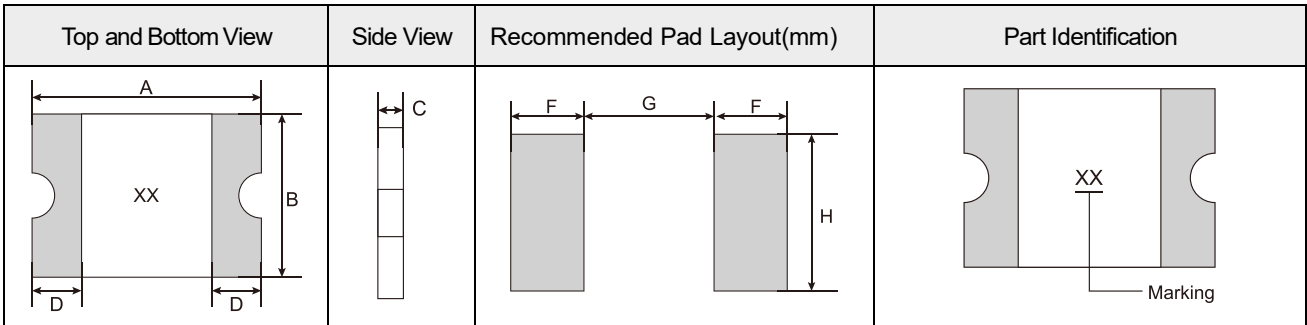
Notes: The temperature rating data is for reference only. Please contact TLC technical support for detail temperature rating information.

Typical time to trip at 25°C



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

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-LSMD100/60	T100	6.73	7.98	4.80	5.44	0.95	1.85	0.30	2.00	4.60	5.30
TLC-LSMD110	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-LSMD200/24	T200	6.73	7.98	4.80	5.44	0.90	1.30	0.30	2.00	4.60	5.30
TLC-LSMD200/33	T200	6.73	7.98	4.80	5.44	0.90	1.30	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	0.60	1.10	0.30	2.00	4.60	5.30
TLC-LSMD260/33	T260	6.73	7.98	4.80	5.44	0.70	1.20	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/16	T300	6.73	7.98	4.80	5.44	1.10	1.50	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-LSMD300/30	T300	6.73	7.98	4.80	5.44	0.70	1.50	0.30	2.00	4.60	5.30
TLC-LSMD300/33	T300	6.73	7.98	4.80	5.44	0.70	1.20	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	1.00	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-LSMD100/60	2920	Tape&Reel	1000
TLC-LSMD110	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-LSMD 200/24	2920	Tape&Reel	1000
TLC-LSMD 200/33	2920	Tape&Reel	1000
TLC-LSMD 250	2920	Tape&Reel	2000
TLC-LSMD 260	2920	Tape&Reel	2000
TLC-LSMD 260D	2920	Tape&Reel	1000
TLC-LSMD 260/33	2920	Tape&Reel	1500
TLC-LSMD300	2920	Tape&Reel	2000
TLC-LSMD300D/16	2920	Tape&Reel	1000
TLC-LSMD300D	2920	Tape&Reel	1000
TLC-LSMD300/30	2920	Tape&Reel	1000
TLC-LSMD300/33	2920	Tape&Reel	1500
TLC-LSMD 400	2920	Tape&Reel	1000
TLC-LSMD450	2920	Tape&Reel	1000
TLC-LSMD 500	2920	Tape&Reel	1000

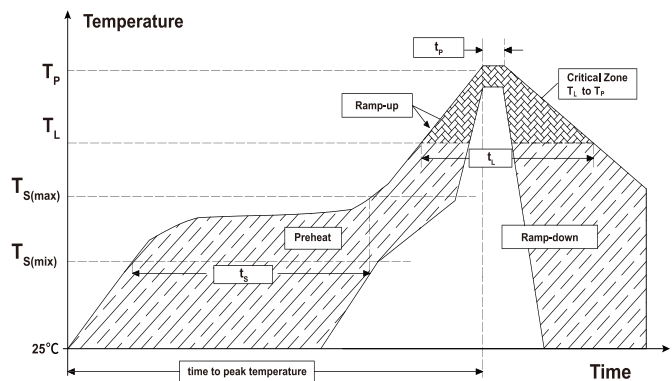
TLC-LSMD 500/8	2920	Tape&Reel	1000
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Reliability Requirement

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 < R1 max
Solderability	245°C ±5°C, 5 Seconds >95% coverage

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 (t _p)	20~40seconds
Cooling rate	Max. 6°C/second
Time from 25°C to Peak Temperature	8 minutes max

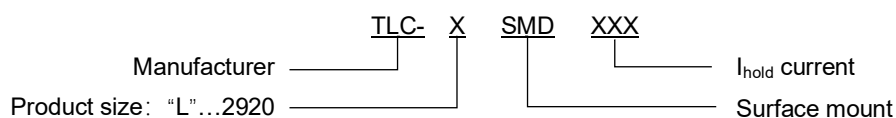


Warning for Reflow:

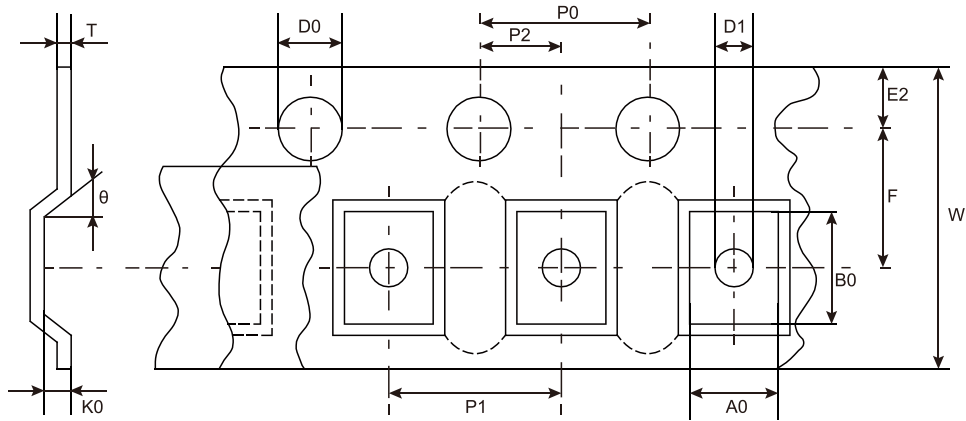
- The printed solder thickness is not over 0.25mm, Excess solder may cause a short circuit, especially during hand soldering.
- If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.
- Device can not be wave soldered. Please contact TLC for hand soldering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

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

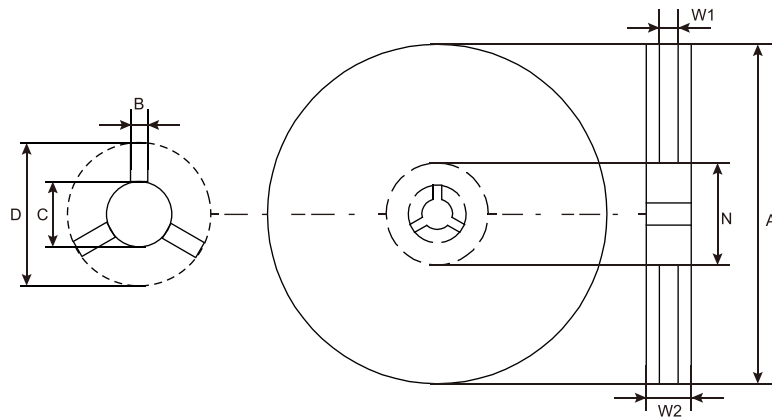
Product Ordering Number System



Tape and Reel Specification



Item	A0	B0	D0	D1	E2	F	K0
Spec.(mm)	5.70±0.10	8.00±0.10	1.50 (+0.10)	1.5 min	1.75±0.10	7.50±0.10	0.90/1.10/1.50(±0.10)
Item	P0	P1	P2	T	W	theta	
Spec.(mm)	4.00±0.10	8.00±0.10	2.00±0.10	0.35 max	16.0±0.10	6°max	



Item	A	B	C	D	N	W1	W2
Spec.(mm)	178±1.0	2.0 (+0.5)	13.0±0.02	21±0.2	60±0.5	17.0±0.30	19.4±0.5

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.

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.