



**BRIGHTTEK**  
BRIGHTTEK (EUROPE) LIMITED

*Brighten up The World With LED!*



ISO/TS 16949:2009



BS EN ISO 14001:2004



QC 90000 IECQ HS1998

Release Date: 26 June 2025 Version: A00

## PRODUCT DATASHEET



- ▶ DC Input Photo Coupler
- ▶ SMD6 Low Profile
- ▶ Random-Phase TRIAC

# TD305X(SL)(T1)-GV



## TD305X(SL) Series

### DESCRIPTION:



The TD305X(SL) series combine an AlGaAs infrared emitting diode as the emitter which is optically coupled to a monolithic silicon random-phase photo TRIAC in a plastic DIP6 package with SMD6 Low Profile lead forming option.

With the robust coplanar double mold structure, TD305X(SL) series provide the most stable isolation feature.

### FEATURES:

#### APPLICATIONS:

- Solenoid/valve controls
- Lighting controls
- Motor controls
- Temperature controls
- Static AC power switches
- Solid state relays
- Interfacing microprocessors to 115 to 240VAC peripherals

- High isolation 5000Vrms
- DC input with random-phase photo TRIAC output
- Operating temperature range -40°C to +100°C
- REACH & RoHS compliance
- MSL class 1
- Regulatory Approvals:
  - UL - UL1577
  - VDE - EN60747-5-5 (VDE0884-5)
  - CQC - GB4943.1, GB8898
  - cUL - CSA Component Acceptance Service Notice 5A
- Packing: 1000pcs/reel



Partner with:



## NAMING & ORDERING INFORMATION:

Naming Information:

<b>TD305 X (SL) (T1) - G V</b>	
<b>TD305X</b>	Part Number
<b>X</b>	Selection: LED Trigger Current (X=1~3)
<b>SL</b>	Lead Form Option: SMD6 Low Profile
<b>T1</b>	Selection: Tape and Reel Option (T1(default)/T2)
<b>G</b>	Green Option
<b>V</b>	VDE Option

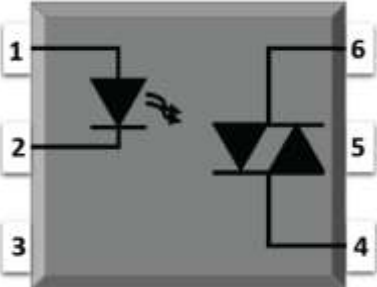
Ordering Information:

<b>TD305X(SL)(T1)-GV</b>						
X = Selection: LED Trigger Current (X=1~3)						
Part Number	Symbol	Values			Unit	Test Condition
		Min.	Typ.	Max.		
TD3051(SL)(T1)-GV	I <sub>FT</sub>	---	---	15	mA	I <sub>TM</sub> =100mA Terminal Voltage=3V
TD3052(SL)(T1)-GV		---	---	10		
TD3053(SL)(T1)-GV		---	---	5		


Version No.	Original Release Date
Rev: A00	05/09/2024

**SCHEMATIC DIAGRAM & MARKING:**

Schematic Diagram:

	PIN Definition	
	1	Anode
	2	Cathode
	3	NC
	4	Terminal
	5	Substrate
	6	Terminal

Marking Information:

	Marking Definition	
	TD	Manufacturer Code
	305X	Part Number & Rank
	V	VDE Applicable
	Y	Fiscal Year
	A	Manufacturing Code
	WW	Work Week

Labelling Information:

 <b>BRIGHTTEK</b> BRIGHTTEK (EUROPE) LIMITED		<p>This product is manufactured, tested, and packed by</p>  <p>for more details, please visit <a href="http://www.tdled.com">www.tdled.com</a></p>
Part No.: XXXXXXXXXXXX	Bin Code: X	
		
Lot No.: XXXXXXXX		
Date Code: XXXX		
QTY: XXX PCS		
		
MSL: 1	    	
Made in Quanzhou Fujian		

## ABSOLUTE CHARACTERISTICS:

### Absolute Maximum Ratings:

Parameter	Symbol	Ratings	Unit
INPUT			
Forward Current	$I_F$	60	mA
Reverse Voltage	$V_R$	6	V
Junction Temperature	$T_j$	125	°C
Input Power Dissipation	$P_i$	100	mW
OUTPUT			
Off-State Output Terminal Voltage	$V_{DRM}$	600	V
Peak Repetitive Surge Current PW=100μs, 120pps	$I_{TSM}$	1	A
On-State RMS Current	$I_{T(RMS)}$	100	mA
Junction Temperature	$T_j$	125	°C
Output Power Dissipation	$P_o$	300	mW
COMMON			
Total Power Dissipation	$P_{tot}$	400	mW
Isolation Voltage	$V_{iso}$	5000 * <sup>1</sup>	Vrms
Operating Temperature	$T_{opr}$	-40~+100	°C
Storage Temperature	$T_{stg}$	-55~+125	°C
Soldering Temperature	$T_{sol}$	260 * <sup>2</sup>	°C

\*1. AC for 1 minute, R.H.=40~60%.

\*2. For 10 seconds max.

## ELECTRICAL CHARACTERISTICS:

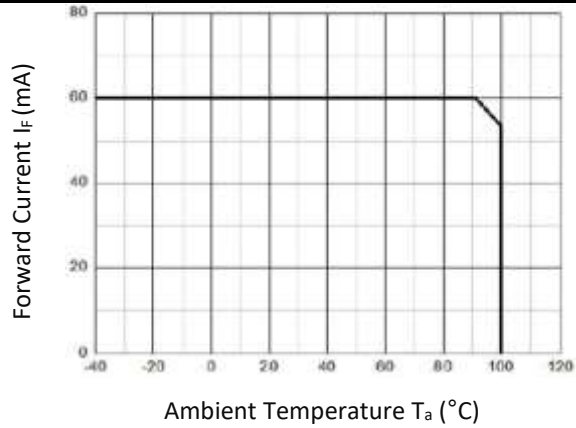
Electrical Optical Characteristics at  $T_a=25^{\circ}\text{C}$ :

Parameter		Symbol	Values			Unit	Test Condition
			Min.	Typ.	Max.		
INPUT							
Forward Voltage		V <sub>F</sub>	---	1.24	1.4	V	I <sub>F</sub> =10mA
Reverse Current		I <sub>R</sub>	---	---	10	μA	V <sub>R</sub> =6V
Input Capacitance		C <sub>IN</sub>	---	8.5	250	pF	V=0, f=1kHz
OUTPUT							
Peak Off-State Current Either Direction		I <sub>DRM</sub>	---	---	100 * <sup>1</sup>	nA	V <sub>DRM</sub> =Rated V <sub>DRM</sub> I <sub>F</sub> =0
Peak On-State Voltage Either Direction		V <sub>TM</sub>	---	1.58	2.5	V	I <sub>TM</sub> =100mA
Critical Rate of Rise of Off-State Voltage		dV/dt	1000	---	---	V/μs	V <sub>PEAK</sub> =400V I <sub>F</sub> =0
TRANSFER CHARACTERISTICS							
LED Trigger Current	TD3051	I <sub>FT</sub>	---	---	15	mA	I <sub>TM</sub> =100mA Terminal Voltage=3V
	TD3052		---	---	10		
	TD3053		---	---	5		
Holding Current		I <sub>H</sub>	---	257	---	μA	---
Isolation Resistance		R <sub>ISO</sub>	10^12	10^14	---	Ω	DC=500V, 40~60% R.H.
Floating Capacitance		C <sub>IO</sub>	---	0.8	---	pF	V=0, f=1MHz

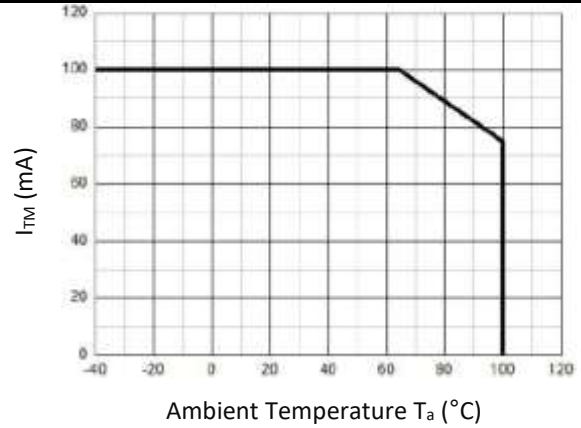
\*1. Test voltage must be applied within  $dV/dt$  rating.

## CHARACTERISTIC CURVES:

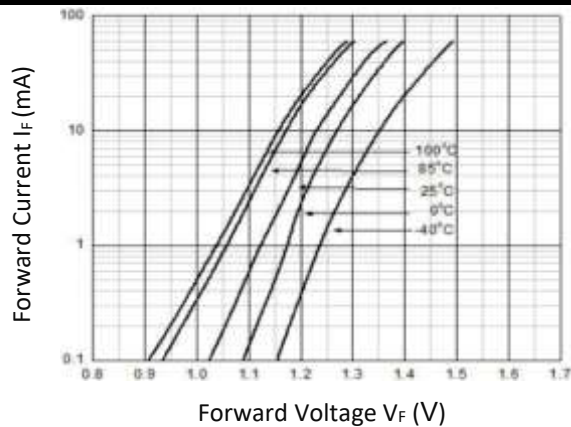
Forward Current v.s. Ambient Temperature



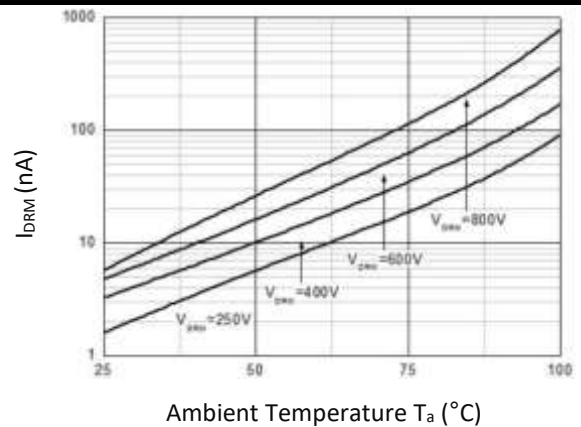
On-State Terminal Current v.s. Ambient Temp.



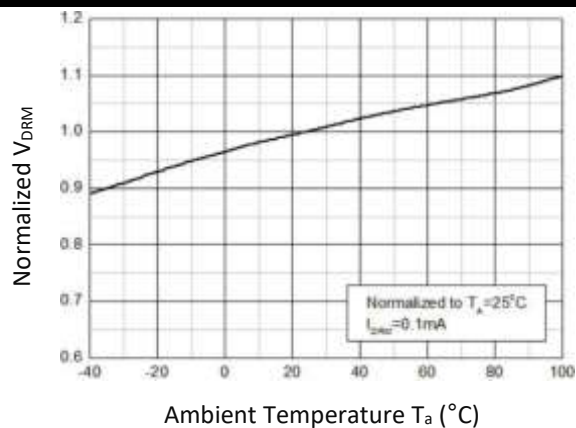
Forward Current v.s. Forward Voltage



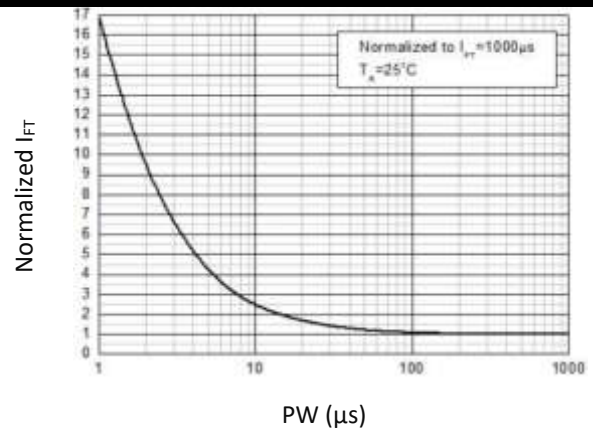
Off-State Terminal Current v.s. Ambient Temperature



Normalized Off-State Terminal Voltage v.s. Ambient Temperature

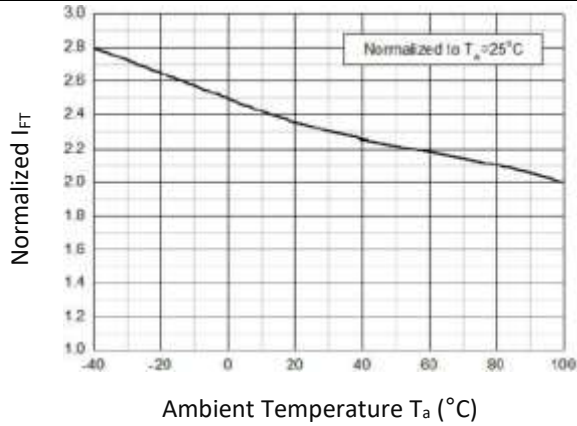


Normalized Trigger Current v.s. LED Trigger Pulse Width

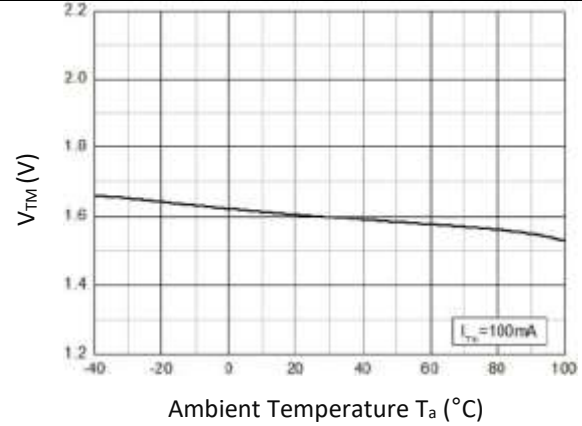


## CHARACTERISTIC CURVES:

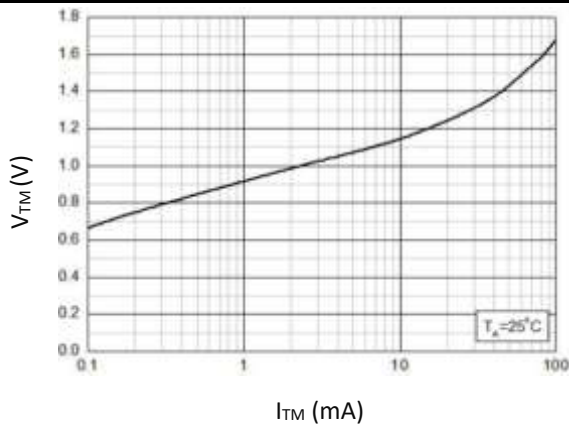
Normalized Trigger Current v.s. Ambient Temperature



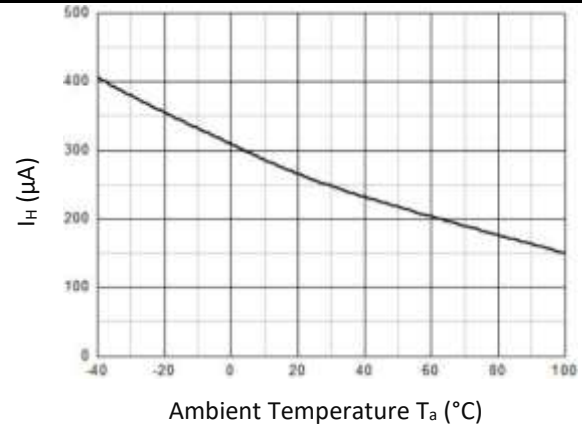
On-State Terminal Voltage v.s. Ambient Temperature



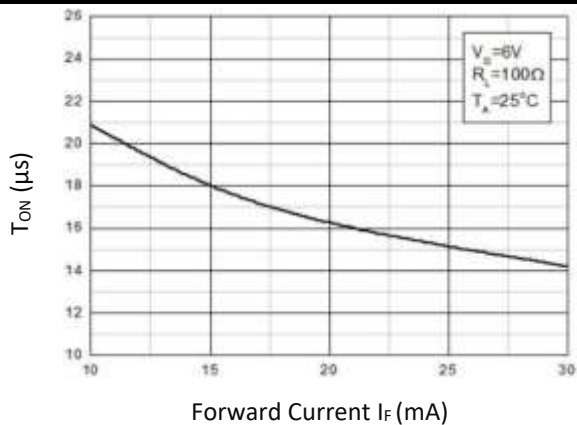
On-State Terminal Voltage v.s. On-State Terminal Current



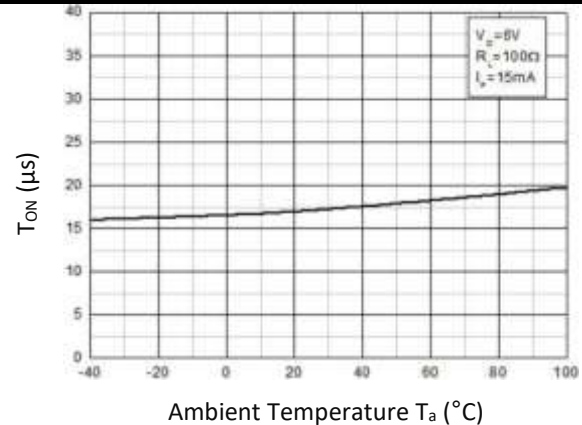
Holding Current v.s. Ambient Temperature



Turn On Time v.s. Forward Current

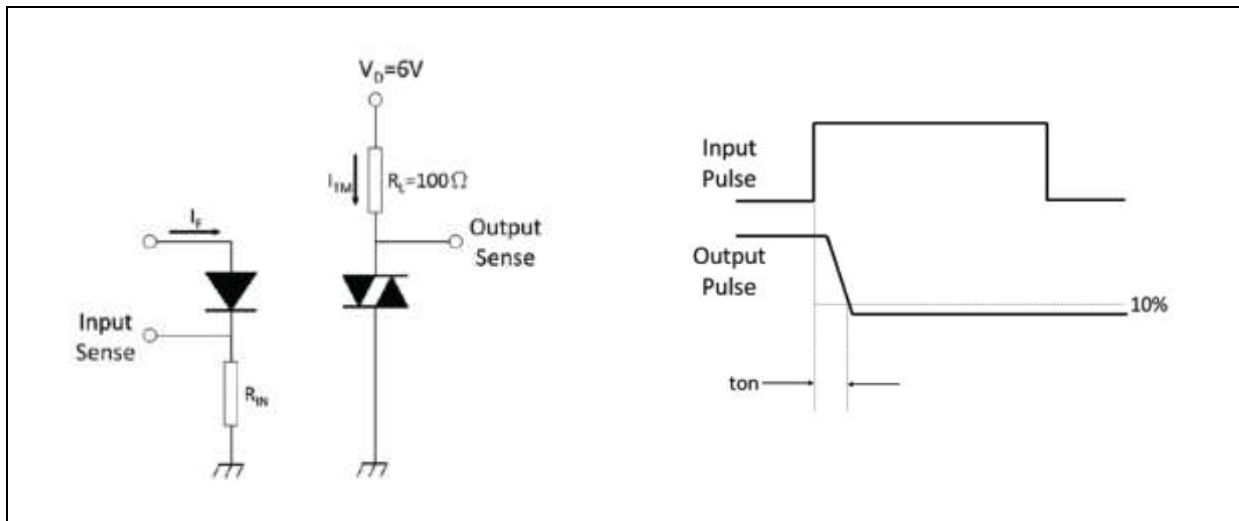


Turn On Time v.s. Ambient Temperature

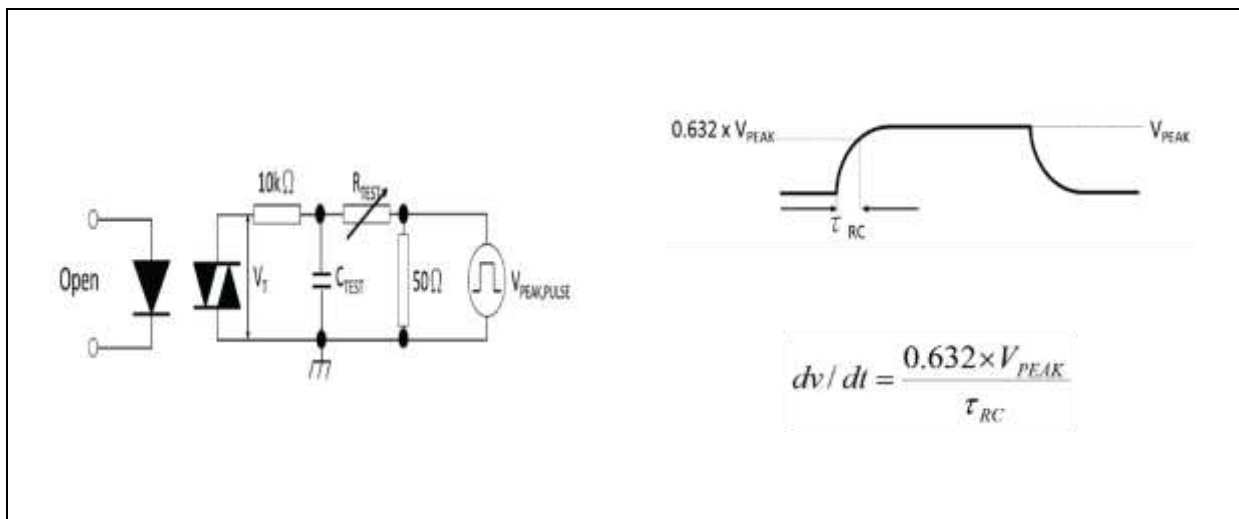


## TEST CIRCUIT:

Test Circuit and Waveforms of Turn On Time:



Test Circuit and Waveforms of  $dv/dt$ :

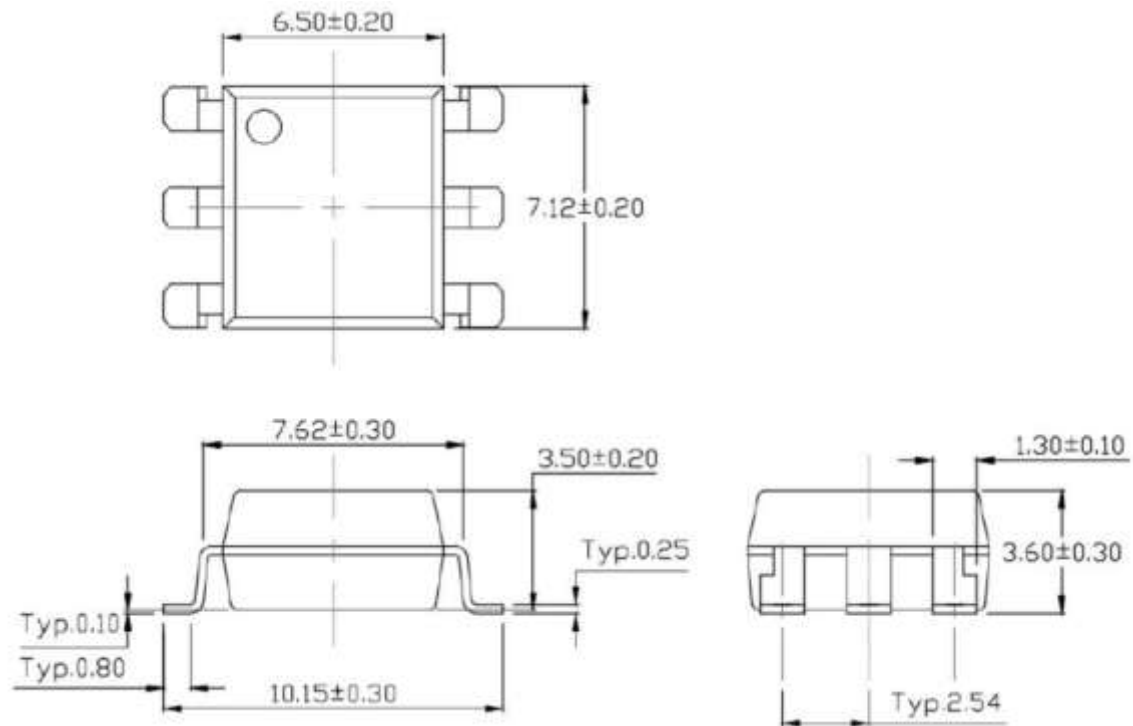




## OUTLINE DIMENSION:

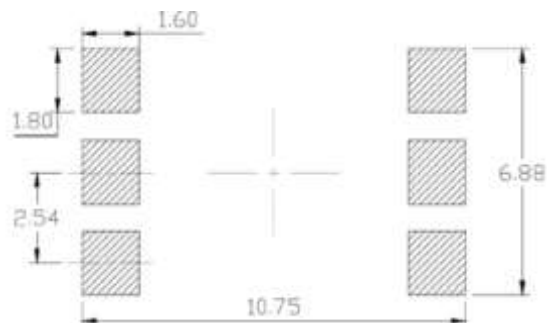
Package Dimension:

Surface Mount Low Profile Lead Forming - SMD (SL Type)



1. All dimensions are in millimetre (mm).

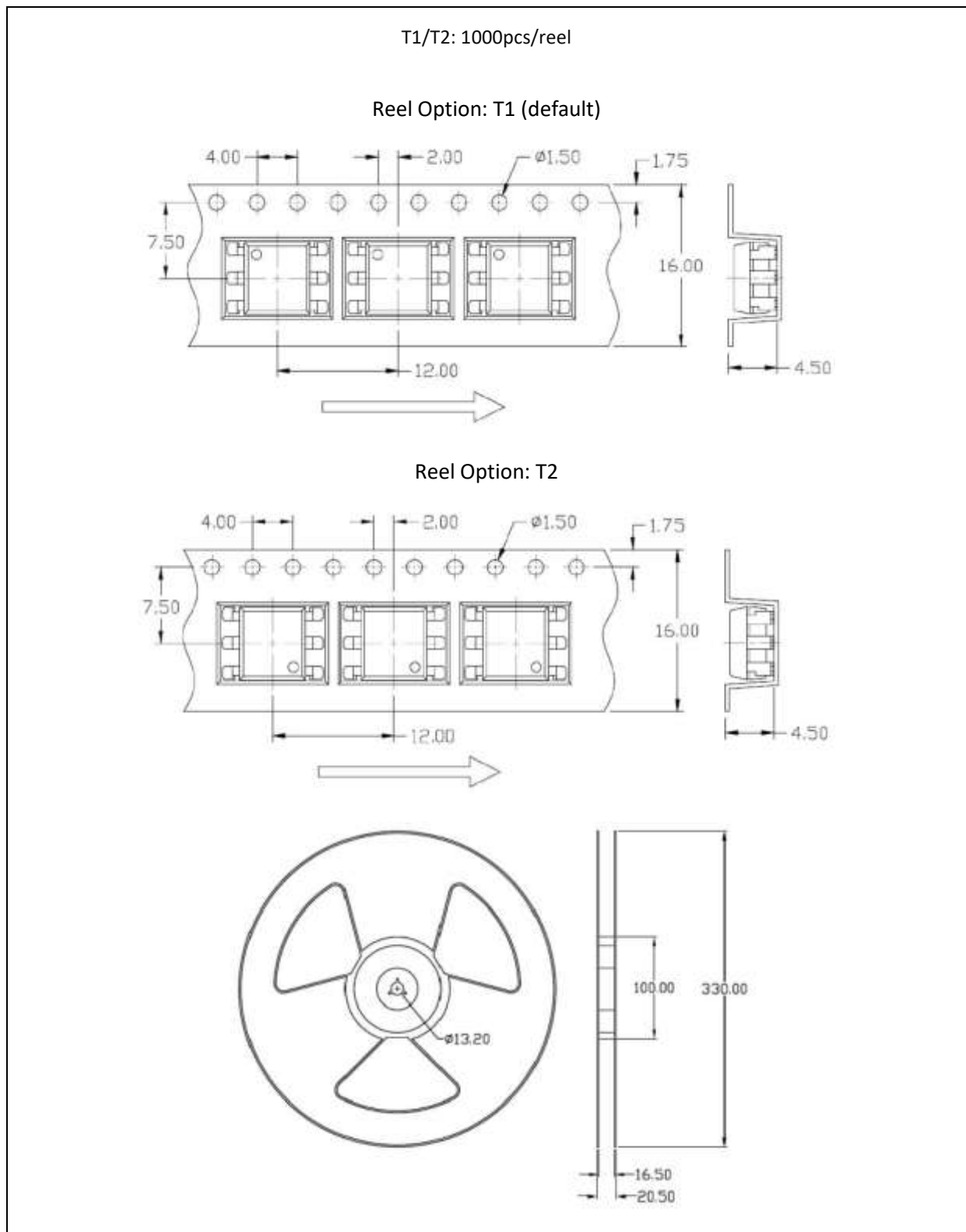
Recommended Soldering Mask:



1. Dimensions are in millimetre (mm).

## PACKING SPECIFICATION:

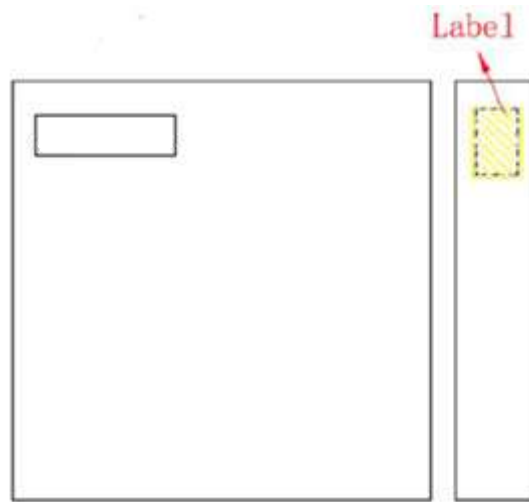
Reel Dimension:



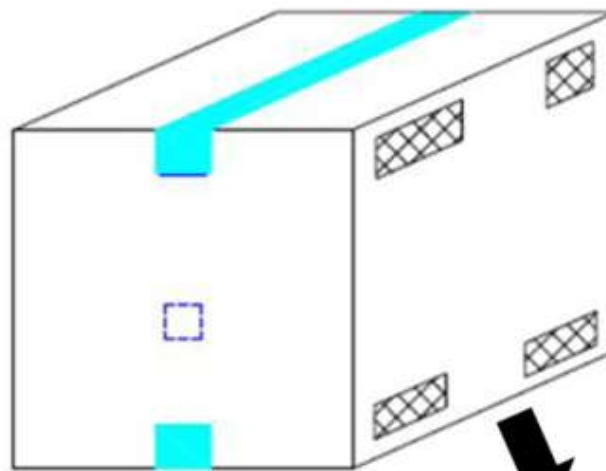
## PACKING SPECIFICATION:

Box Dimension:

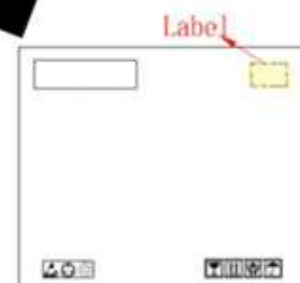
T1/T2: 3 reels (3Kpcs)/inner box, 5 inner boxes (15Kpcs)/carton



● L x W x H = 36cm x 36cm x 6.9cm

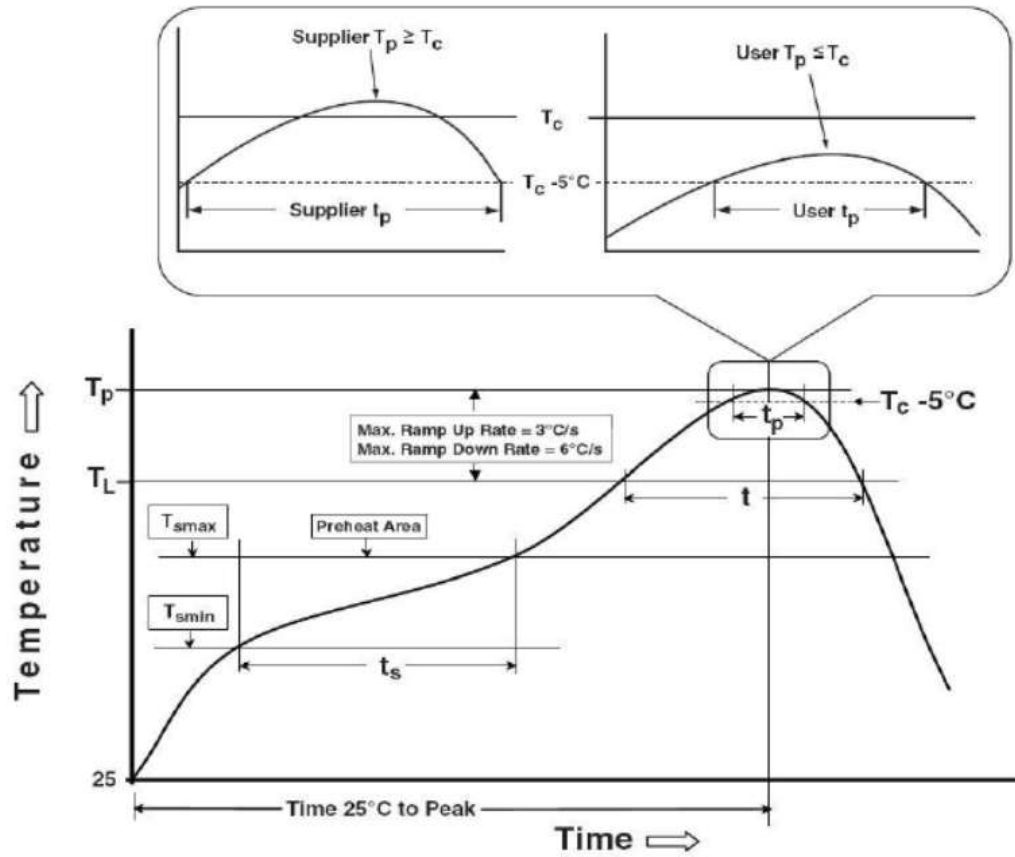


● L x W x H = 45cm x 38cm x 38cm



## RECOMMENDED SOLDERING PROFILE:

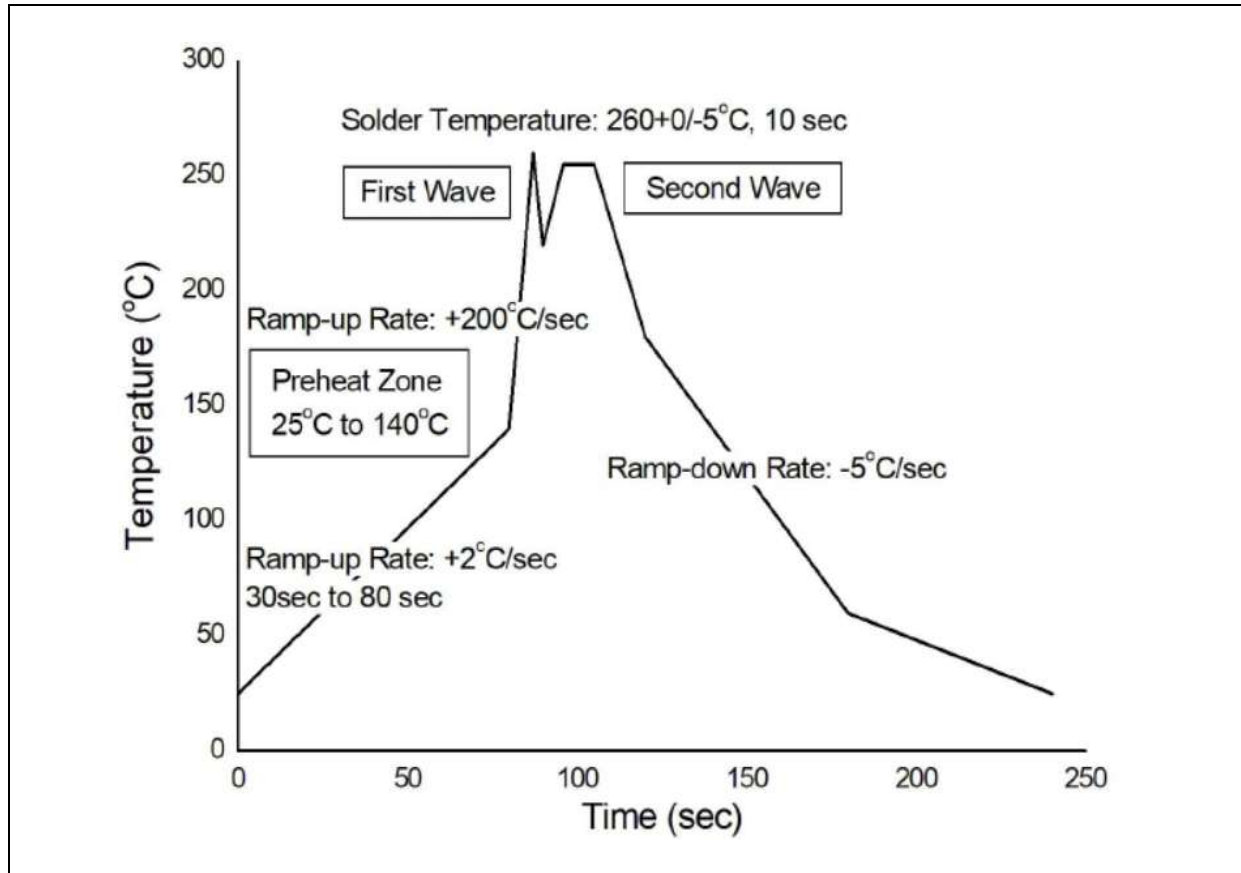
Reflow Information:



Profile Feature	Sn-Pb Assembly Profile	Pb-Free Assembly Profile
Temperature Min. ( $T_{smin}$ )	100°C	150°C
Temperature Max. ( $T_{smax}$ )	150°C	200°C
Time ( $t_s$ ) from ( $T_{smin}$ to $T_{smax}$ )	60-120 seconds	60-120 seconds
Ramp-up Rate ( $t_l$ to $t_p$ )	3°C/second max.	3°C/second max.
Liquidous Temperature ( $T_L$ )	183°C	217°C
Time ( $t_l$ ) Maintained Above ( $T_L$ )	60-150 seconds	60-150 seconds
Peak Body Package Temperature	235°C +0°C / -5°C	260°C +0°C / -5°C
Time ( $t_p$ ) within 5°C of 260°C	20 seconds	30 seconds
Ramp-down Rate ( $T_p$ to $T_L$ )	6°C/second max.	6°C/second max.
Time 25°C to Peak Temperature	6 minutes max.	8 minutes max.

## RECOMMENDED SOLDERING PROFILE:

Wave Soldering (JESD22-A111 Compliant):



Hand Soldering:

Soldering Temperature	380±5°C
Soldering Time	3 sec max.

Note:

- One time soldering is recommended for all soldering methods.
- Do not solder more than three times for IR reflow soldering.