



**BRIGHTTEK**  
**BRIGHTTEK (EUROPE) LIMITED**

*Brighten up The World With LED!*



ISO/TS 16949:2009

BS-EM ISO 14001:2004

QC 900000 IECQ HSP98

## PRODUCT DATASHEET



- ▶ DC Input Photo Coupler
- ▶ SMD6 Low Profile
- ▶ Zero-Cross TRIAC

Release Date: 20 July 2025 Version: A00

# TD304X(SL)(T1)-GV



## TD304X(SL) Series



### DESCRIPTION:

The TD304X(SL) series combine an AlGaAs infrared emitting diode as the emitter which is optically coupled to a monolithic silicon zero-cross photo TRIAC in a plastic DIP6 package with SMD6 Low Profile lead forming option.

### FEATURES:

- High isolation 5000Vrms
- DC input with zero-cross 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
- Packing: 1000pcs/reel

### APPLICATIONS:

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



Partner with: LIGHTNING

## NAMING & ORDERING INFORMATION:

Naming Information:

<b>TD304 X (SL) (T1)- G V</b>	
<b>TD304</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

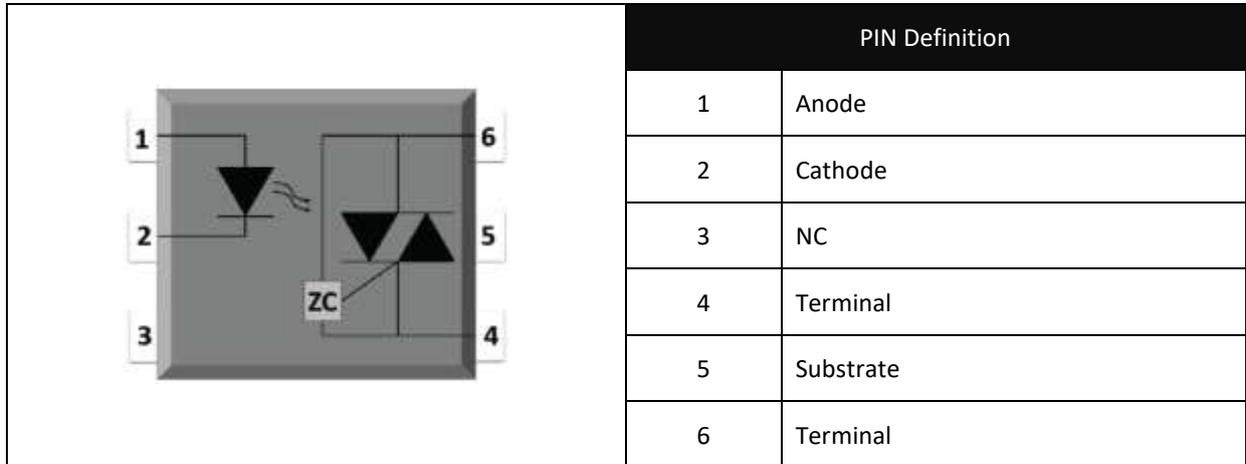
Ordering Information:

<b>TD304X(SL)(T1)-GV</b>						
$\underline{X}$ = Selection: LED Trigger Current (X=1~3)						
Part Number	Symbol	Values			Unit	Test Condition
		Min.	Typ.	Max.		
TD3041(SL)(T1)-GV	I <sub>FT</sub>	---	---	15	mA	I <sub>TM</sub> =100mA Terminal Voltage=3V
TD3042(SL)(T1)-GV		---	---	10		
TD3043(SL)(T1)-GV		---	---	5		

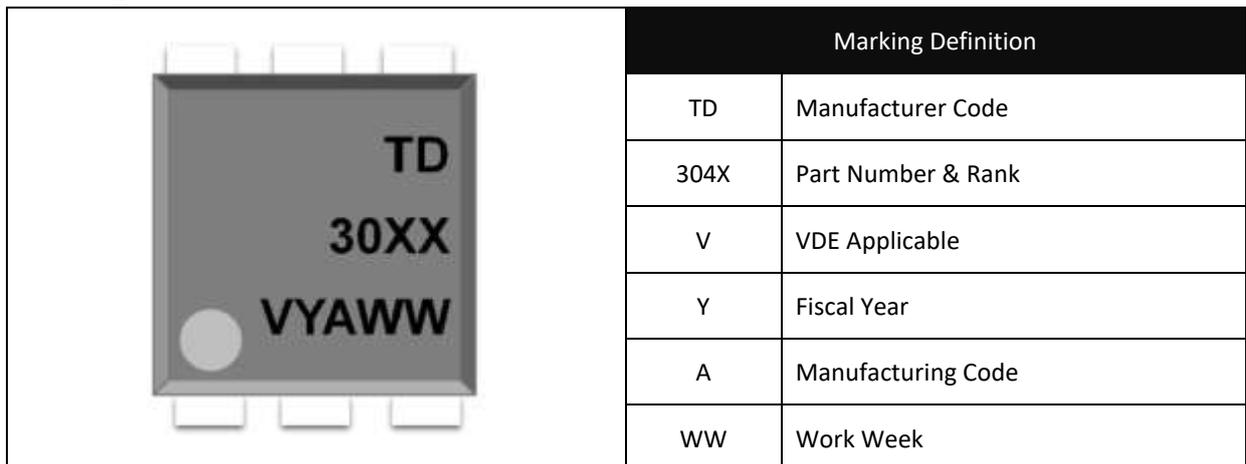
Version No.	Original Release Date
Rev: A00	05/09/2024

## SCHEMATIC DIAGRAM & MARKING:

Schematic Diagram:



Marking Information:



Labelling Information:



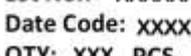
Part No.: XXXXXXXXXXXX Bin Code: X



Lot No.: XXXXXXXX

Date Code: XXXX

QTY: XXX PCS




MSL: 1

Made in Quanzhou Fujian



This product is manufactured by



for Brighttek (Europe) Limited

## 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	$V_{DRM}$	400	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 *1	Vrms
Operating Temperature	$T_{opr}$	-40~+100	°C
Storage Temperature	$T_{stg}$	-55~+125	°C
Soldering Temperature	$T_{sol}$	260 *2	°C

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

\*2. For 10 seconds max.

## ELECTRICAL CHARACTERISTICS:

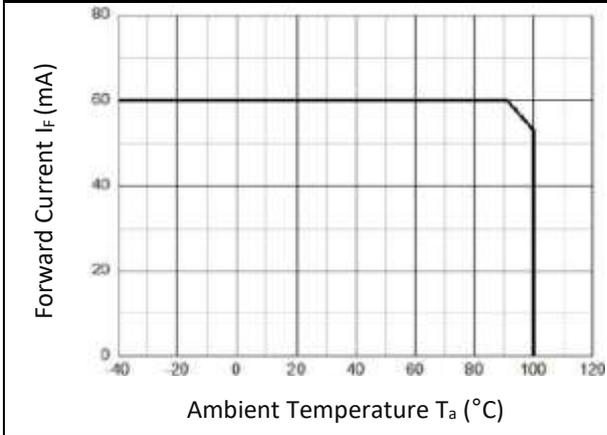
Electrical Optical Characteristics at  $T_a=25^{\circ}\text{C}$ :

Parameter	Symbol	Values			Unit	Test Condition	
		Min.	Typ.	Max.			
<b>INPUT</b>							
Forward Voltage	$V_F$	---	1.24	1.4	V	$I_F=10\text{mA}$	
Reverse Current	$I_R$	---	---	10	$\mu\text{A}$	$V_R=6\text{V}$	
Input Capacitance	$C_{IN}$	---	8.5	250	pF	$V=0, f=1\text{kHz}$	
<b>OUTPUT</b>							
Peak Off-State Current Either Direction	$I_{DRM}$	---	---	500 *1	nA	$V_{DRM}=\text{Rated } V_{DRM}$ $I_F=0$	
Peak On-State Voltage Either Direction	$V_{TM}$	---	1.59	2.5	V	$I_{TM}=100\text{mA}$	
Critical Rate of Rise of Off-State Voltage	$dV/dt$	1000	---	---	$\text{V}/\mu\text{s}$	$V_{PEAK}=400\text{V}$ $I_F=0$	
<b>TRANSFER CHARACTERISTICS</b>							
LED Trigger Current	TD3041	$I_{FT}$	---	---	15	mA	$I_{TM}=100\text{mA}$ Terminal Voltage=3V
	TD3042		---	---	10		
	TD3043		---	---	5		
Holding Current	$I_H$	---	237	---	$\mu\text{A}$	---	
Isolation Resistance	$R_{ISO}$	$10^{12}$	$10^{14}$	---	$\Omega$	DC=500V, 40~60% R.H.	
Floating Capacitance	$C_{IO}$	---	0.4	---	pF	$V=0, f=1\text{MHz}$	
<b>ZERO-CROSSING CHARACTERISTICS</b>							
Inhibit Voltage	$V_{INH}$	---	---	20	V	$I_F=\text{Rated } I_{FT}$	
Leakage in Inhibited State	$I_{DRM2}$	---	---	500	$\mu\text{A}$	$I_F=\text{Rated } I_{FT}$ $V_{DRM}=\text{Rated } V_{DRM}$	

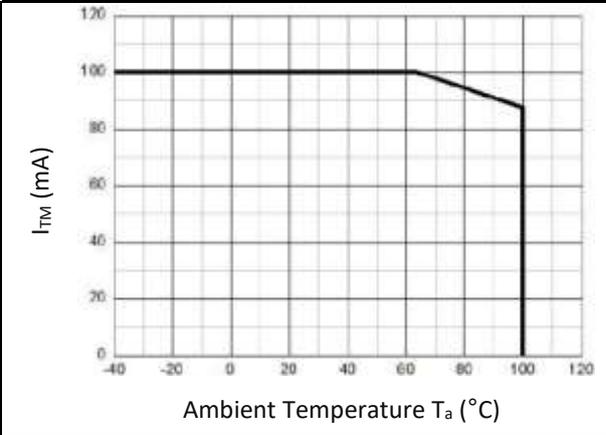
\*1. Test voltage must be applied within  $dV/dt$  rating.

### CHARACTERISTIC CURVES:

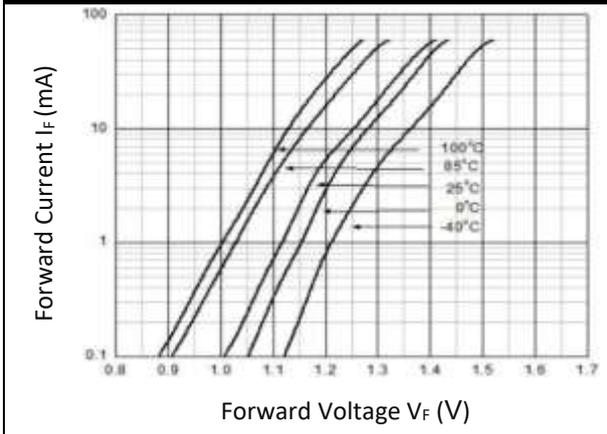
Forward Current v.s. Ambient Temperature



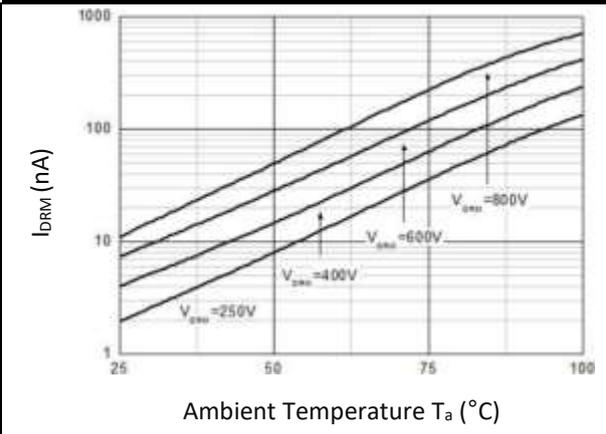
On-State Terminal Current v.s. Ambient Temp.



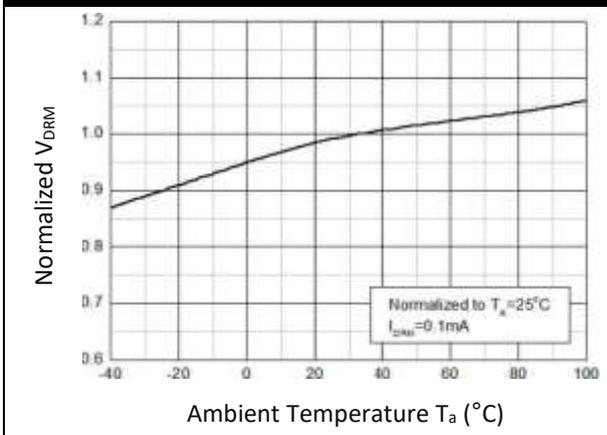
Forward Current v.s. Forward Voltage



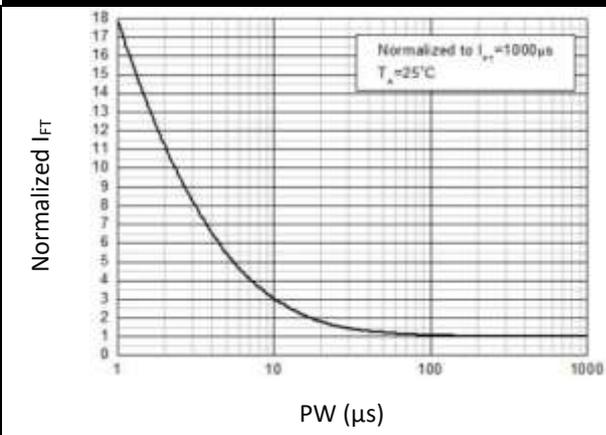
Off-State Terminal Current v.s. Ambient Temperature



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

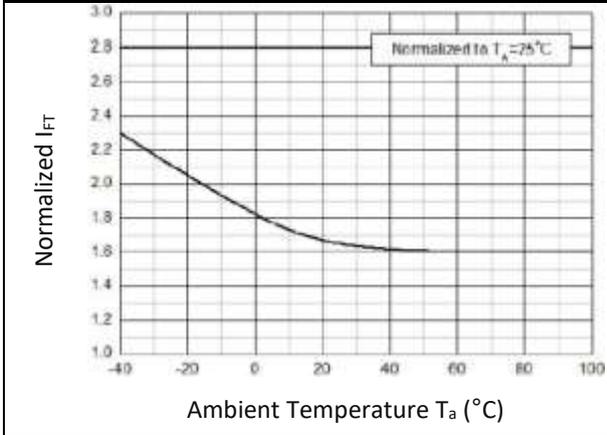


Normalized Trigger Current v.s. LED Trigger Pulse Width

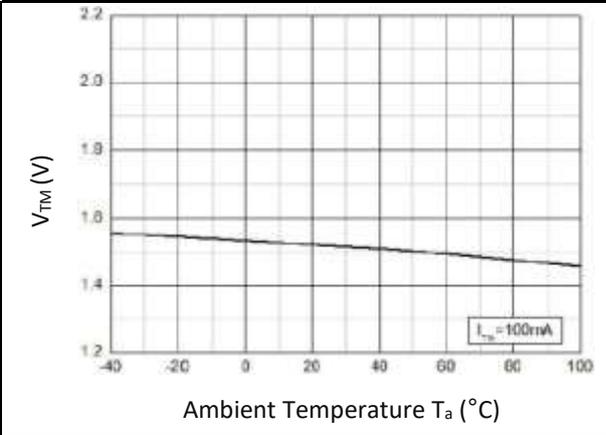


## CHARACTERISTIC CURVES:

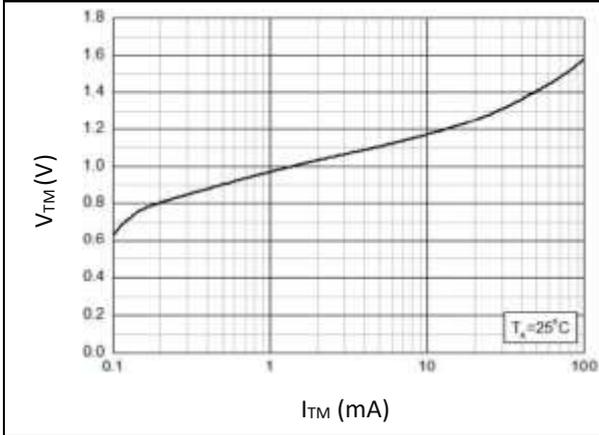
Normalized Trigger Current v.s. Ambient Temperature



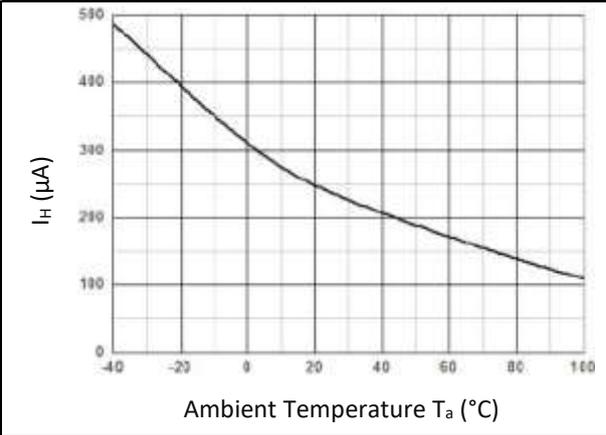
On-State Terminal Voltage v.s. Ambient Temperature



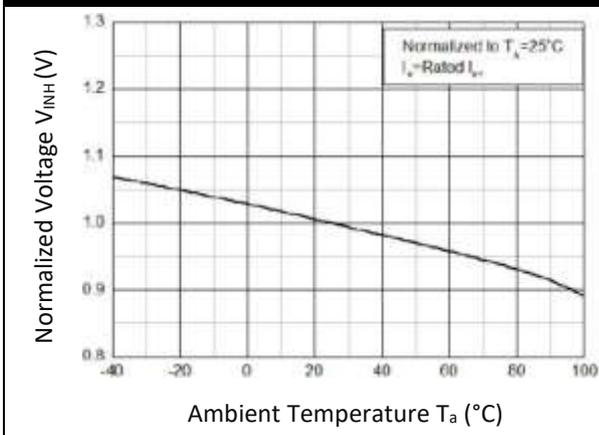
On-State Terminal Voltage v.s. On-State Terminal Current



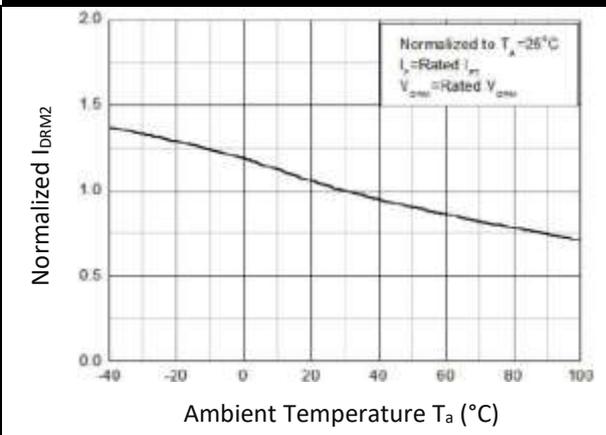
Holding Current v.s. Ambient Temperature



Normalized Inhibit Voltage v.s. Ambient Temperature

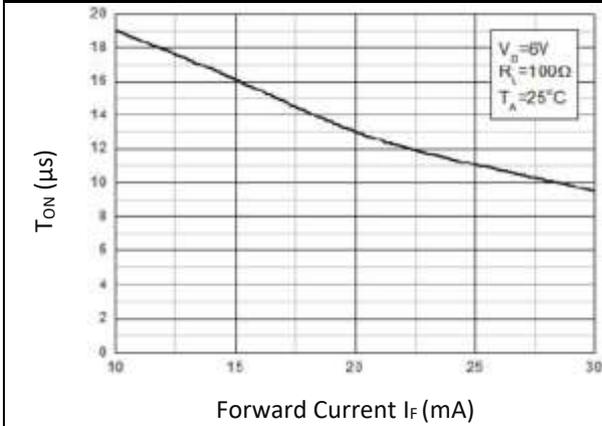


Normalized Leakage in Inhibit State v.s. Ambient Temperature

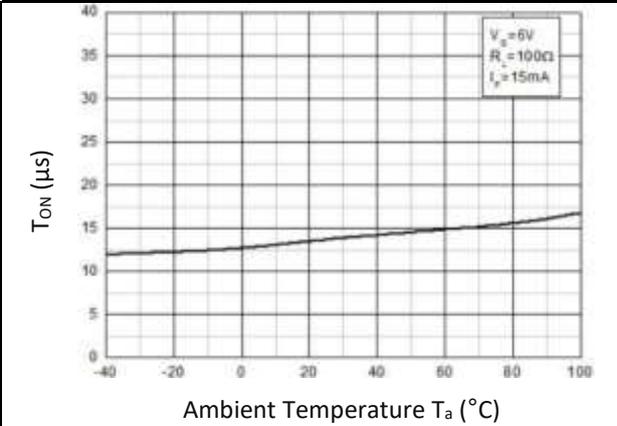


**CHARACTERISTIC CURVES:**

Turn On Time v.s. Forward Current

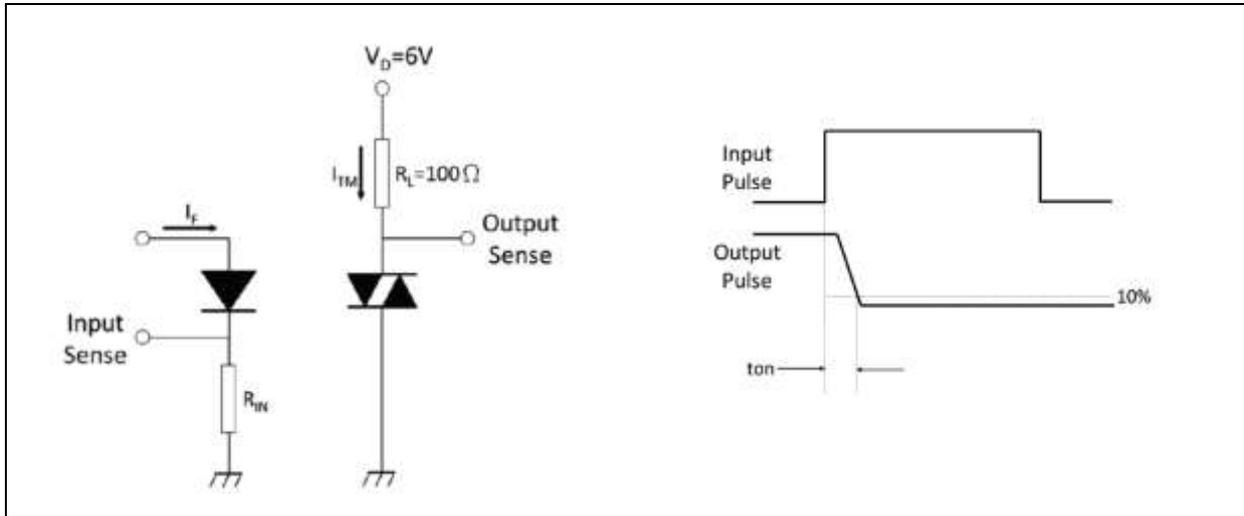


Turn On Time v.s. Ambient Temperature

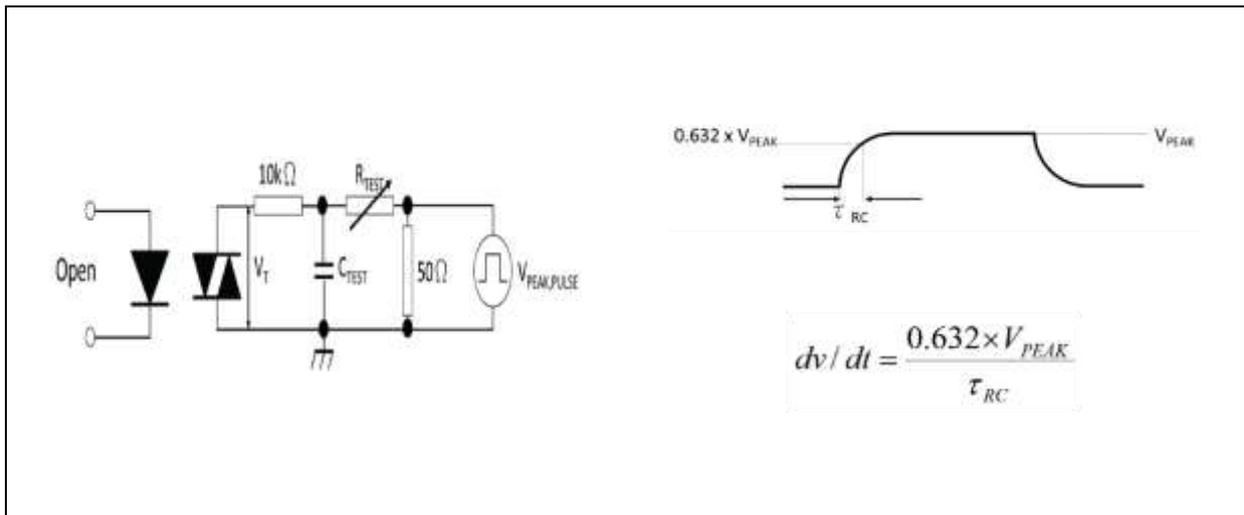


## TEST CIRCUIT:

Test Circuit and Waveforms of Turn On Time:

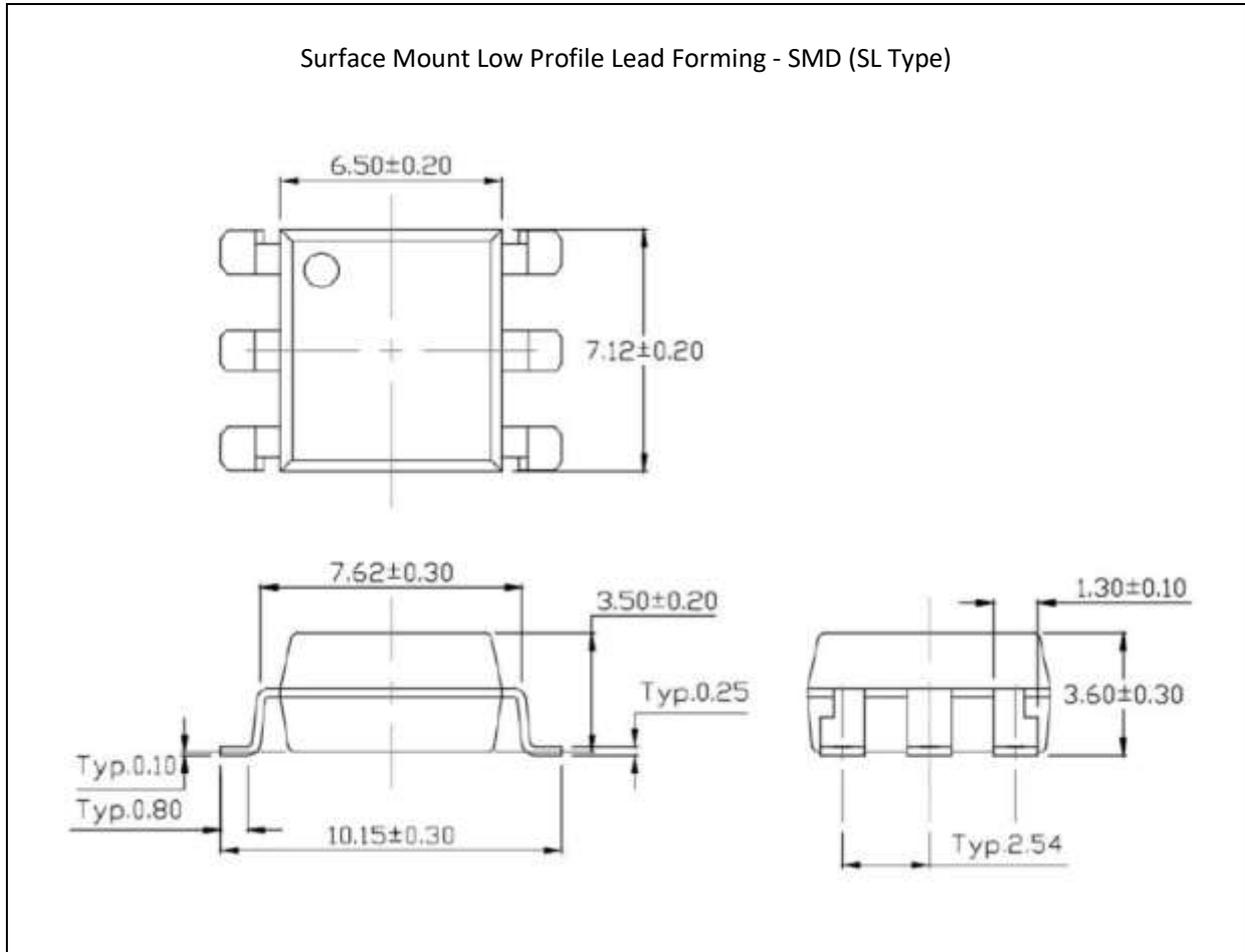


Test Circuit and Waveforms of  $dv/dt$ :



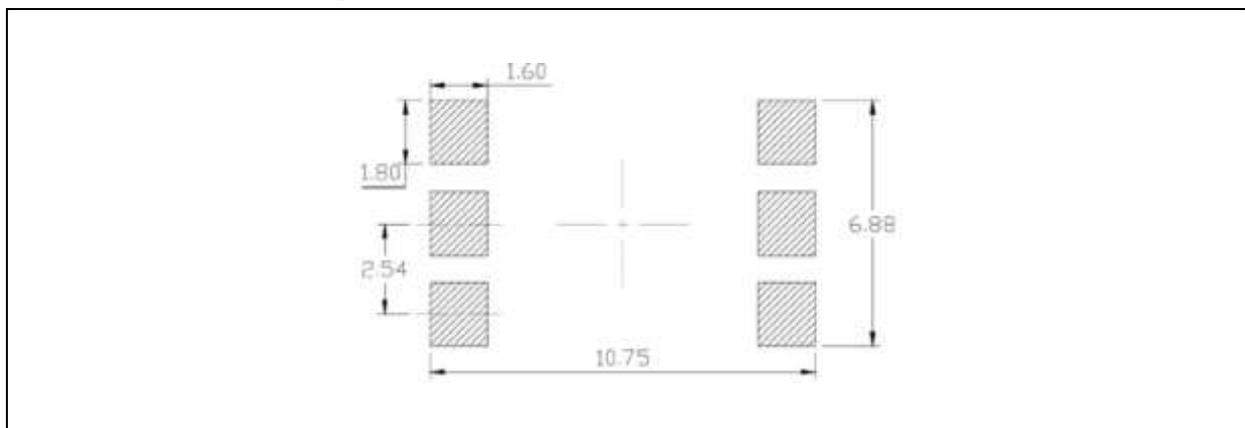
## OUTLINE DIMENSION:

Package Dimension:



1. All dimensions are in millimetre (mm).

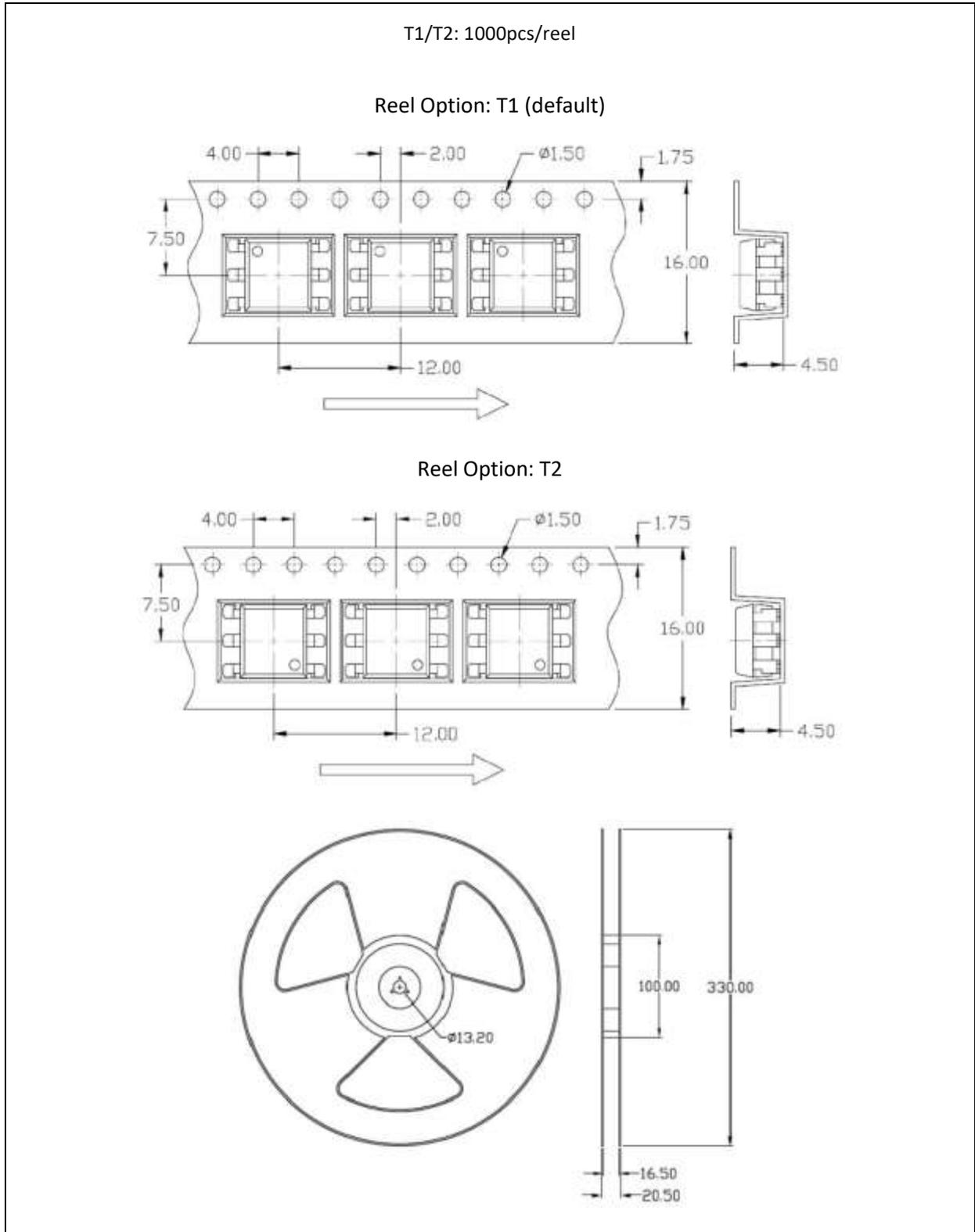
Recommended Soldering Mask:



1. Dimensions are in millimetre (mm).

**PACKING SPECIFICATION:**

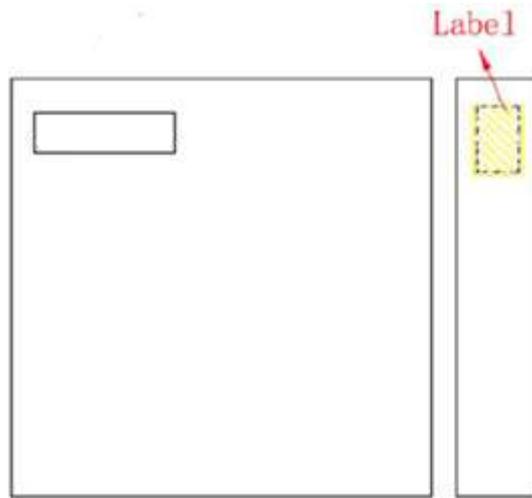
Reel Dimension:



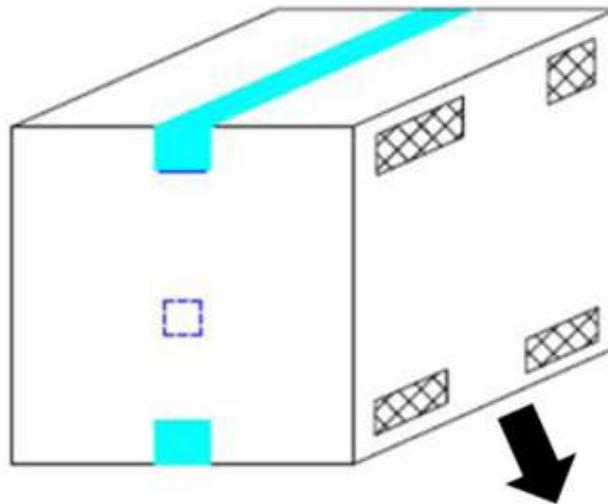
## PACKING SPECIFICATION:

Box Dimension:

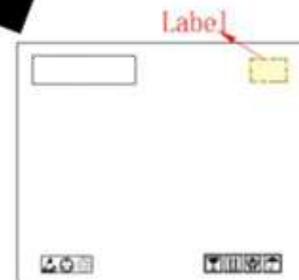
T1/T2: 3 reels (3Kpcs)/inner box, 5 inner boxes (15Kpcs)/carton



- L x W x H = 36cm x 36cm x 6.9cm

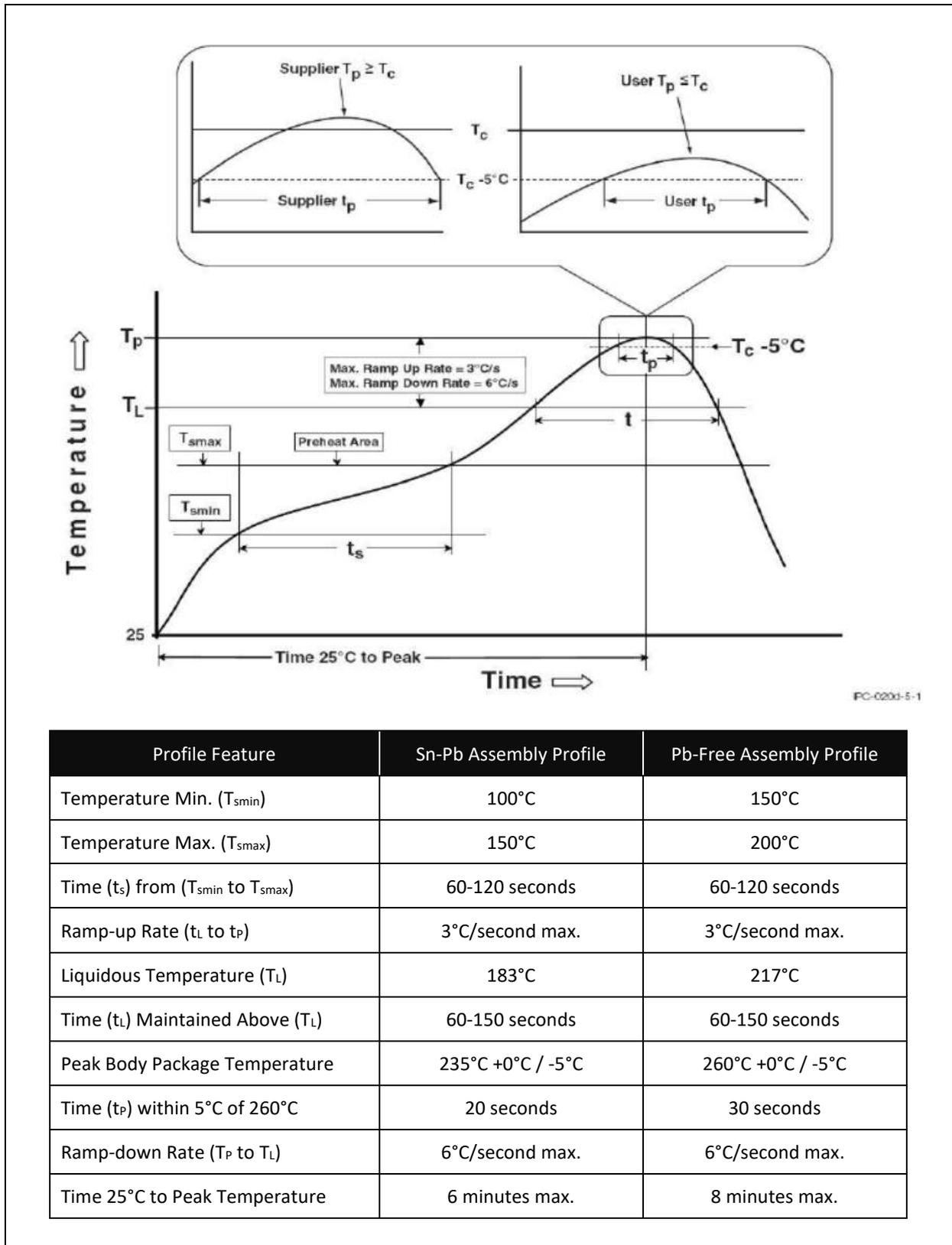


- L x W x H = 45cm x 38cm x 38cm



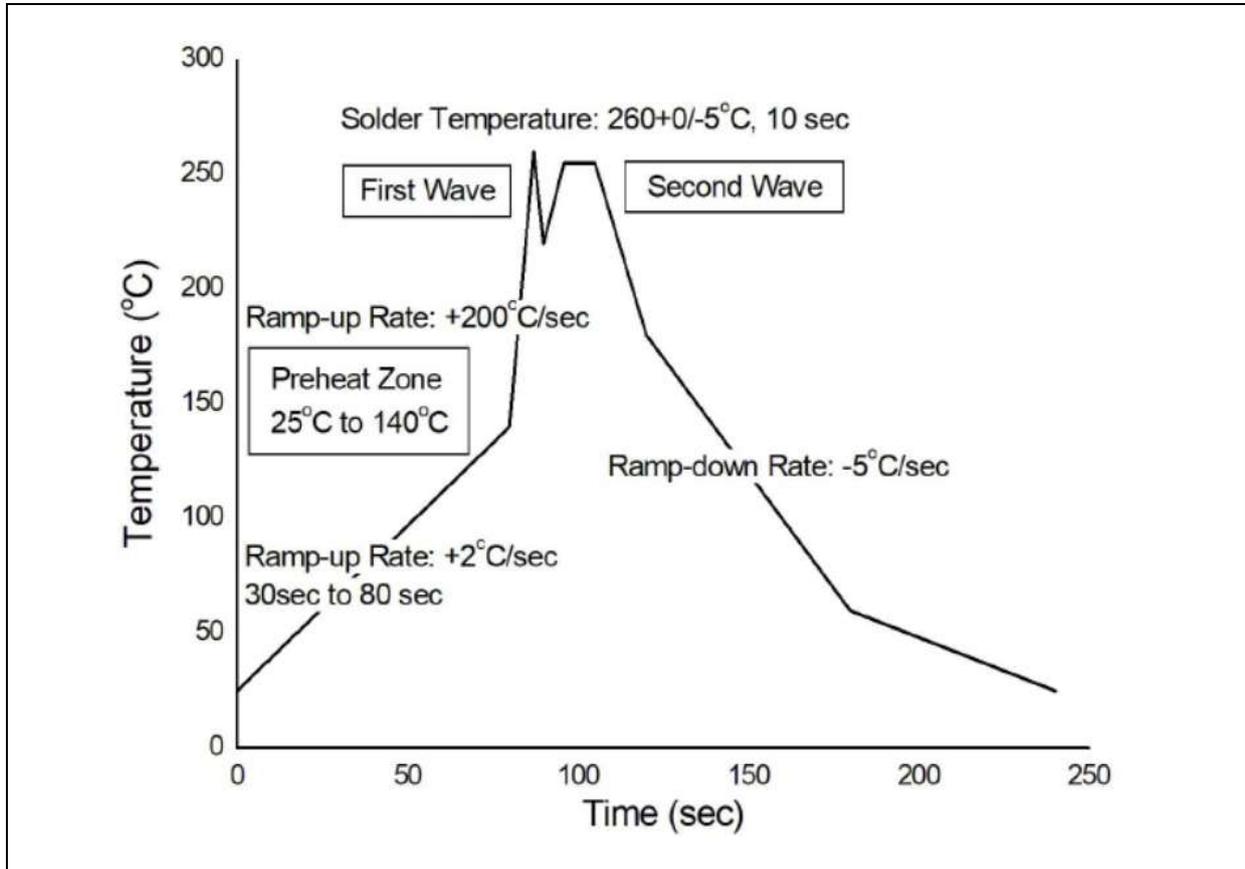
## RECOMMENDED SOLDERING PROFILE:

Reflow Information:



## 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.