



BRIGHTTEK

BRIGHTTEK (EUROPE) LIMITED

Brighten up The World With LED!



ISO/TS 16949:2009



BS EN ISO 14001:2004



QC 080000 IECQ HSPM

PRODUCT DATASHEET



- ▶ DC Input Photo Coupler
- ▶ Standard DIP4
- ▶ Zero-Cross TRIAC

TD306X-4L-GV



Release Date: 10 June 2025 Version: A00



TD306X-4L Series

TD306X-4L Series

DESCRIPTION:



The TD306X-4L 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 DIP4 package with different lead forming options.

With the robust coplanar double mold structure, TD306X-4L 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 zero-cross photo TRIAC output
- Operating temperature range -40°C to +100°C
- REACH & RoHS compliance; Halogen free
- 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: 100pcs/tube



Partner with: LIGHTNING

NAMING & ORDERING INFORMATION:

Naming Information:

| | |
|---------------------------|--|
| TD306 X - 4L - G V | |
| TD306 | Part Number |
| X | Selection: LED Trigger Current (X=1~3) |
| 4L | DIP4 Based Package |
| G | Green Option |
| V | VDE Option |

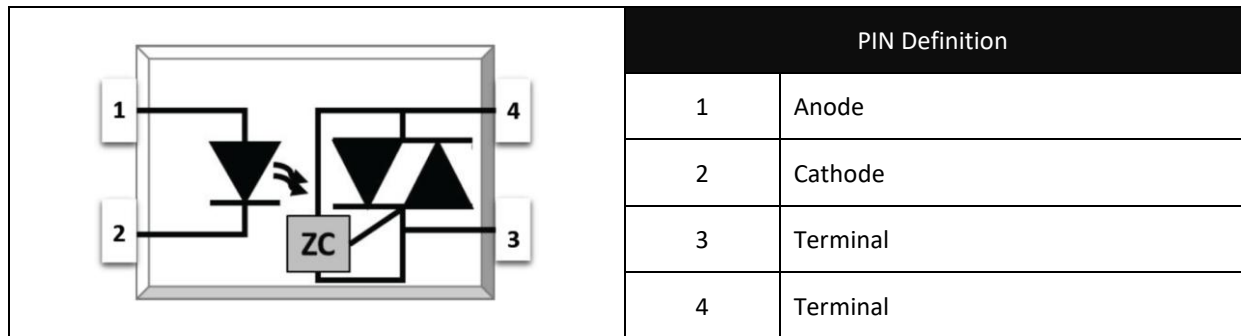
Ordering Information:

| TD306X-4L-GV | | | | | | |
|--|-----------------|--------|------|------|------|---|
| X = Selection: LED Trigger Current (X=1~3) | | | | | | |
| Part Number | Symbol | Values | | | Unit | Test Condition |
| | | Min. | Typ. | Max. | | |
| TD3061-4L-GV | I _{FT} | --- | --- | 15 | mA | I _{TM} =100mA Terminal Voltage=3V |
| TD3062-4L-GV | | --- | --- | 10 | | |
| TD3063-4L-GV | | --- | --- | 5 | | |

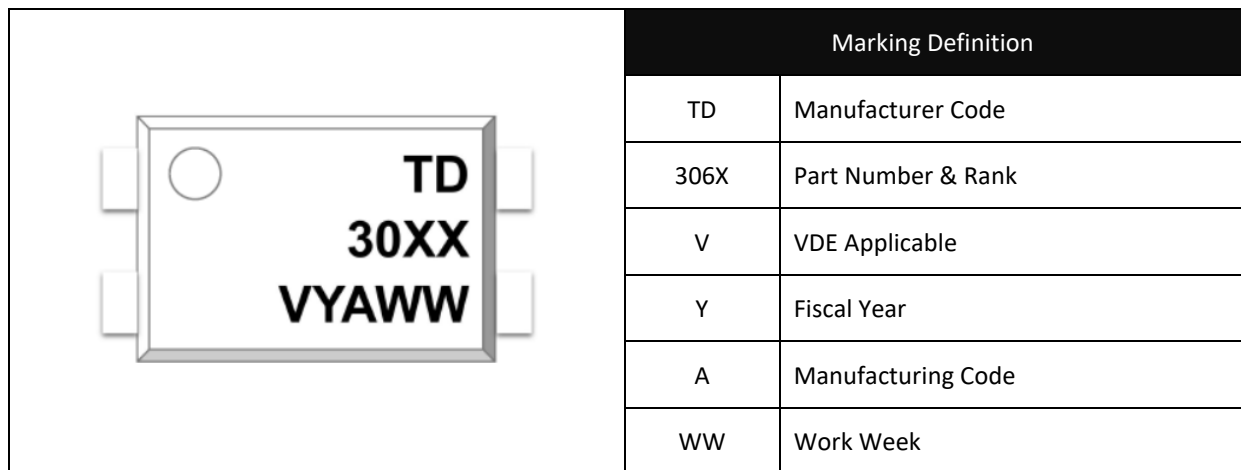
| Version No. | Original Release Date |
|-------------|-----------------------|
| Rev: A00 | 05/09/2024 |

SCHEMATIC DIAGRAM & MARKING:

Schematic Diagram:



Marking Information:



Labelling Information:


BRIGHTTEK
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This product is manufactured, tested, and packed by



Part No.: XXXXXXXXXXXX Bin Code: X



Lot No.: XXXXXXXX

Date Code: XXXX

QTY: XXX PCS



MSL: 1

Made in Quanzhou Fujian

for more details, please visit www.tdled.com







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 * 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:

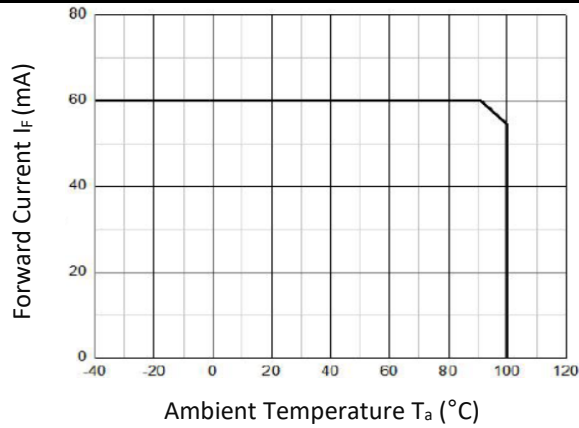
Electrical Optical Characteristics at $T_a=25^{\circ}\text{C}$:

| Parameter | | Symbol | Values | | | Unit | Test Condition |
|---|-----------|-------------------|--------|-------|--------|------|---|
| | | | Min. | Typ. | Max. | | |
| INPUT | | | | | | | |
| Forward Voltage | | V _F | --- | 1.24 | 1.4 | V | I _F =10mA |
| Reverse Current | | I _R | --- | --- | 10 | μA | V _R =6V |
| Input Capacitance | | C _{IN} | --- | 8.5 | 250 | pF | V=0, f=1kHz |
| OUTPUT | | | | | | | |
| Peak Off-State Current Either Direction | | I _{DRM} | --- | --- | 500 *1 | nA | V _{DRM} =Rated V _{DRM} I _F =0 |
| Peak Off-State Voltage Either Direction | | V _{TM} | --- | 1.59 | 2.5 | V | I _{TM} =100mA |
| Critical Rate of Rise of Off-State Voltage | | dV/dt | 1000 | --- | --- | V/μs | V _{PEAK} =400V I _F =0 |
| TRANSFER CHARACTERISTICS | | | | | | | |
| LED Trigger Current | TD3061-4L | I _{FT} | --- | --- | 15 | mA | I _{TM} =100mA Terminal Voltage=3V |
| | TD3062-4L | | --- | --- | 10 | | |
| | TD3063-4L | | --- | --- | 5 | | |
| Holding Current | | I _H | --- | 237 | --- | μA | --- |
| Isolation Resistance | | R _{ISO} | 10^12 | 10^14 | --- | Ω | DC=500V, 40~60% R.H. |
| Floating Capacitance | | C _{IO} | --- | 0.4 | 1 | pF | V=0, f=1MHz |
| ZERO-CROSSING CHARACTERISTICS | | | | | | | |
| Inhibit Voltage | | V _{INH} | --- | --- | 20 | V | I _F =Rated I _{FT} |
| Leakage in Inhibited State | | I _{DRM2} | --- | --- | 500 | μA | I _F =Rated I _{FT} V _{DRM} =Rated V _{DRM} |

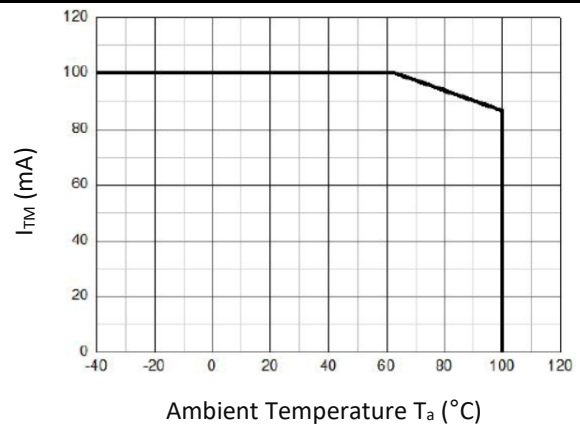
*1. Test voltage must be applied within dV/dt rating.

CHARACTERISTIC CURVES:

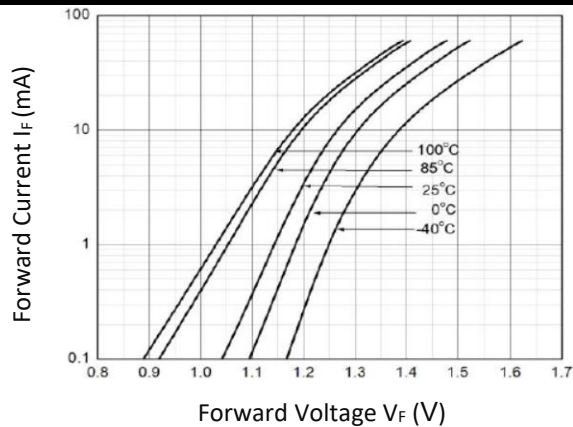
Forward Current v.s. Ambient Temperature



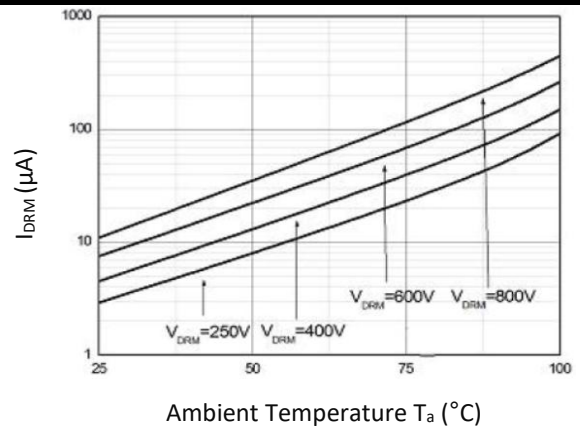
On-State Terminal Current v.s. Ambient Temperature



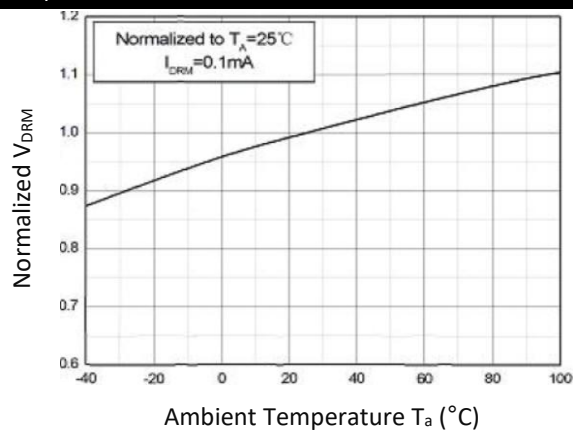
Forward Current v.s. Forward Voltage



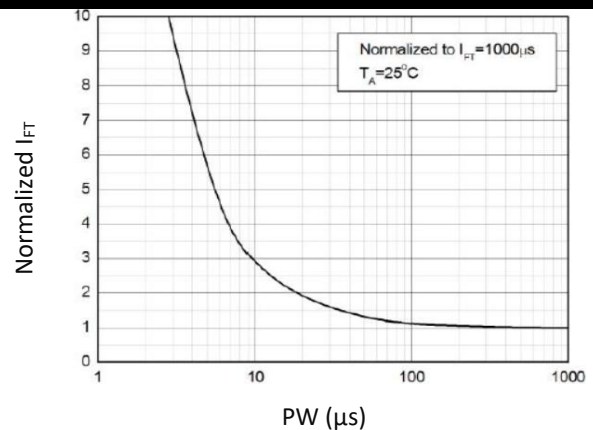
Off-State Terminal Current v.s. Ambient Temperature



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

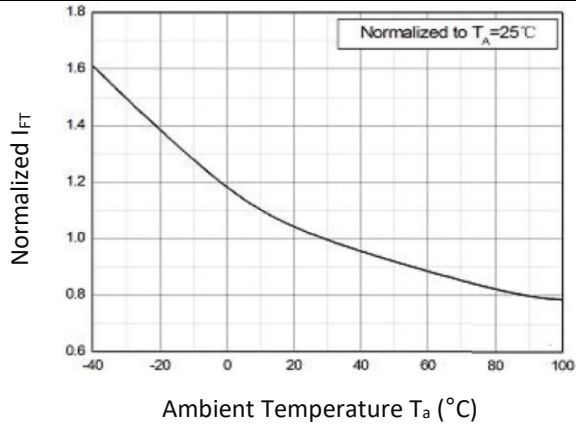


Normalized Trigger Current v.s. LED Trigger Pulse Width

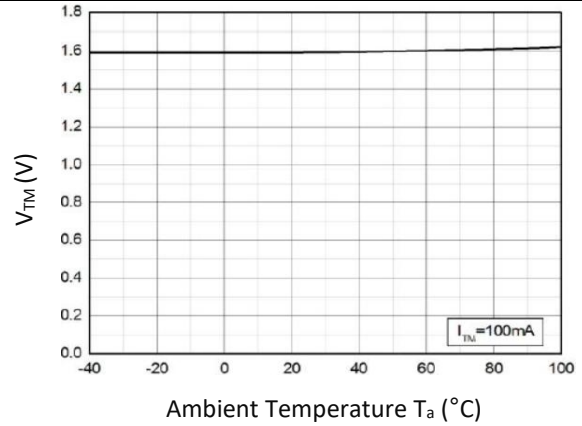


CHARACTERISTIC CURVES:

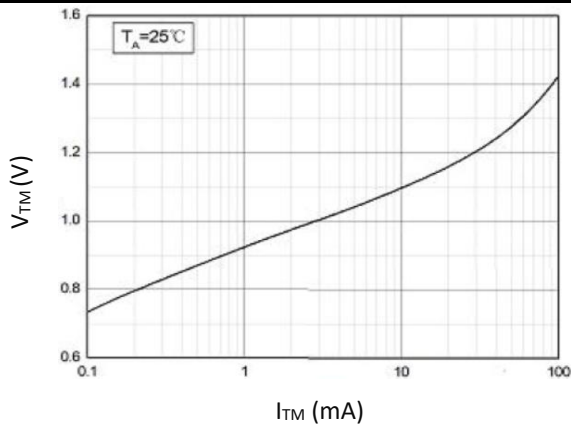
Normalized Trigger Current v.s. Ambient Temperature



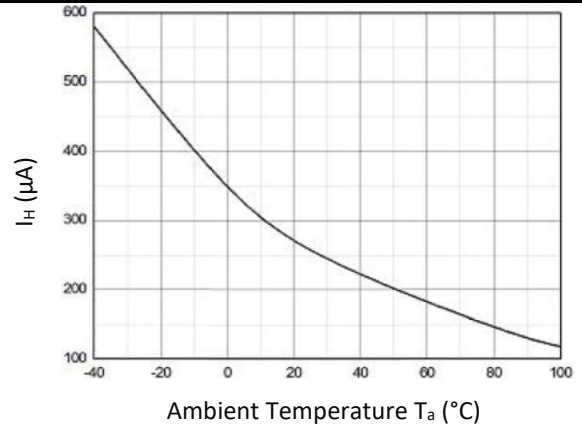
On-State Terminal Voltage v.s. Ambient Temperature



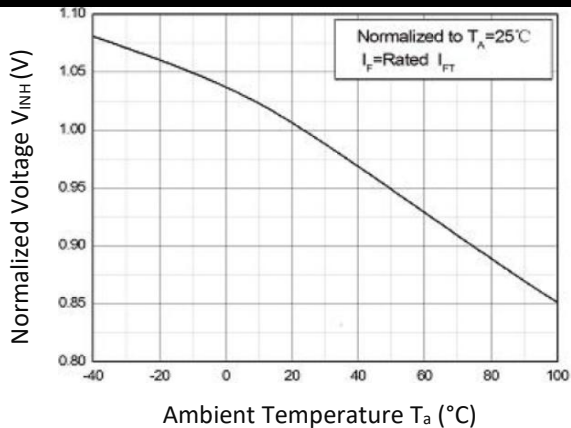
On-State Terminal Voltage v.s. On-State Terminal Current



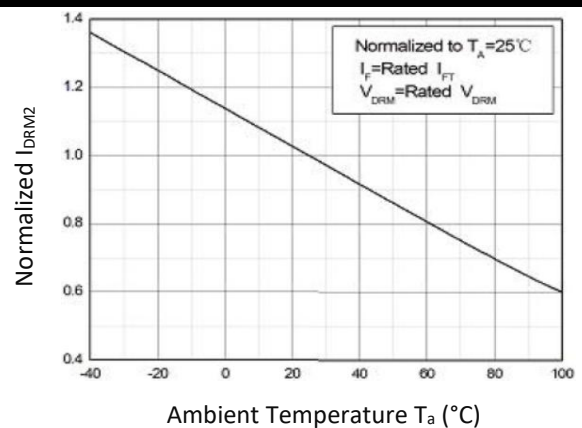
Holding Current v.s. Ambient Temperature



Normalized Inhibit Voltage v.s. Ambient Temperature

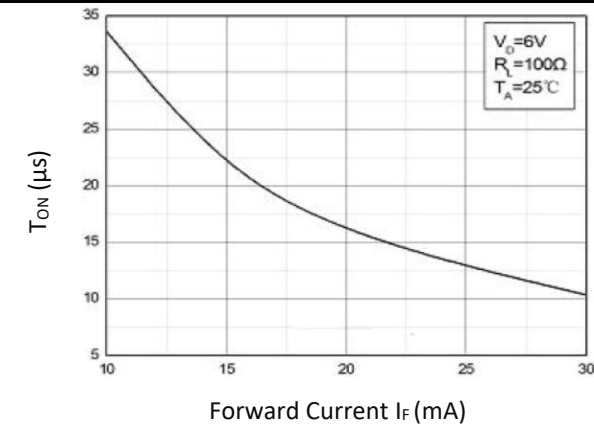


Normalized Leakage in Inhibit State v.s. Ambient Temperature

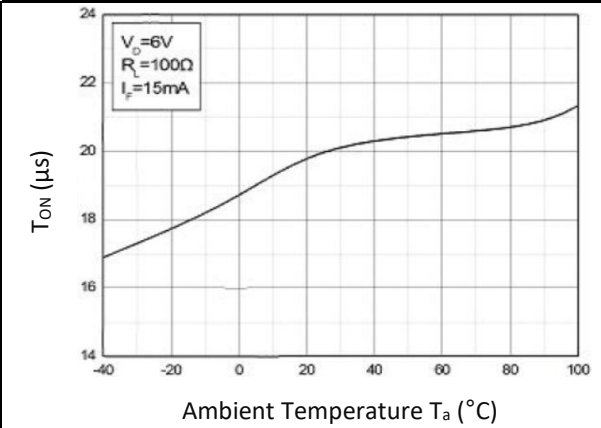


CHARACTERISTIC CURVES:

Turn On Time v.s. Forward Current

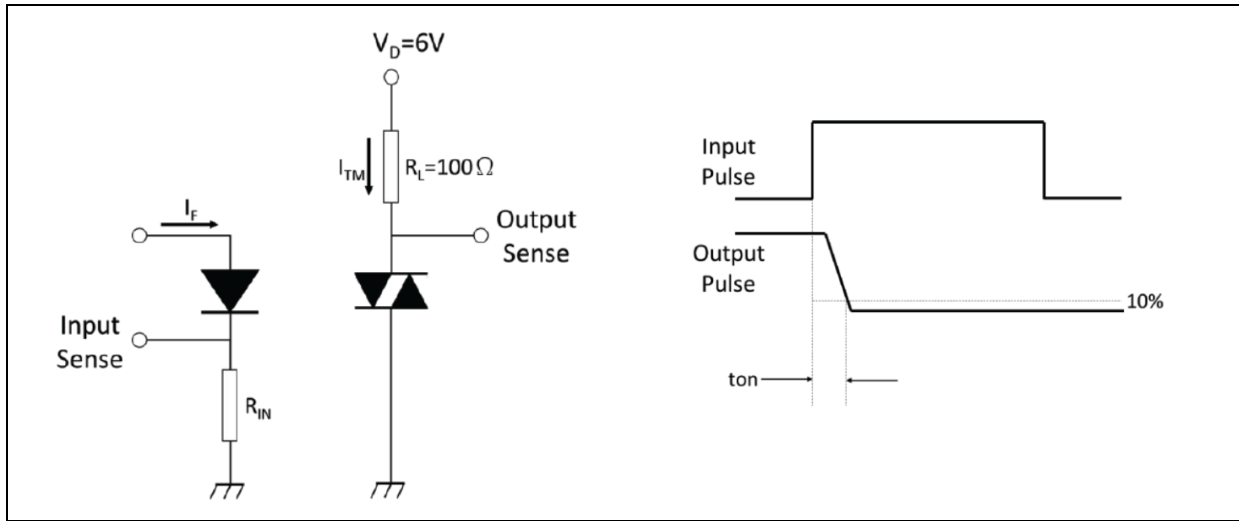


Turn On Time v.s. Ambient Temperature

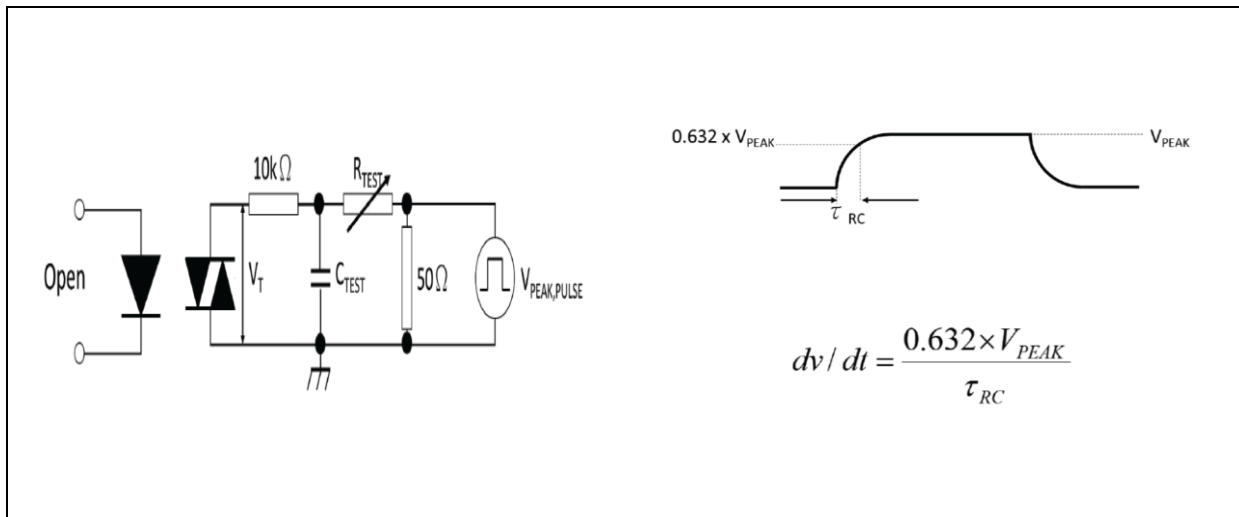


TEST CIRCUIT:

Test Circuit and Waveforms of Turn On Time:

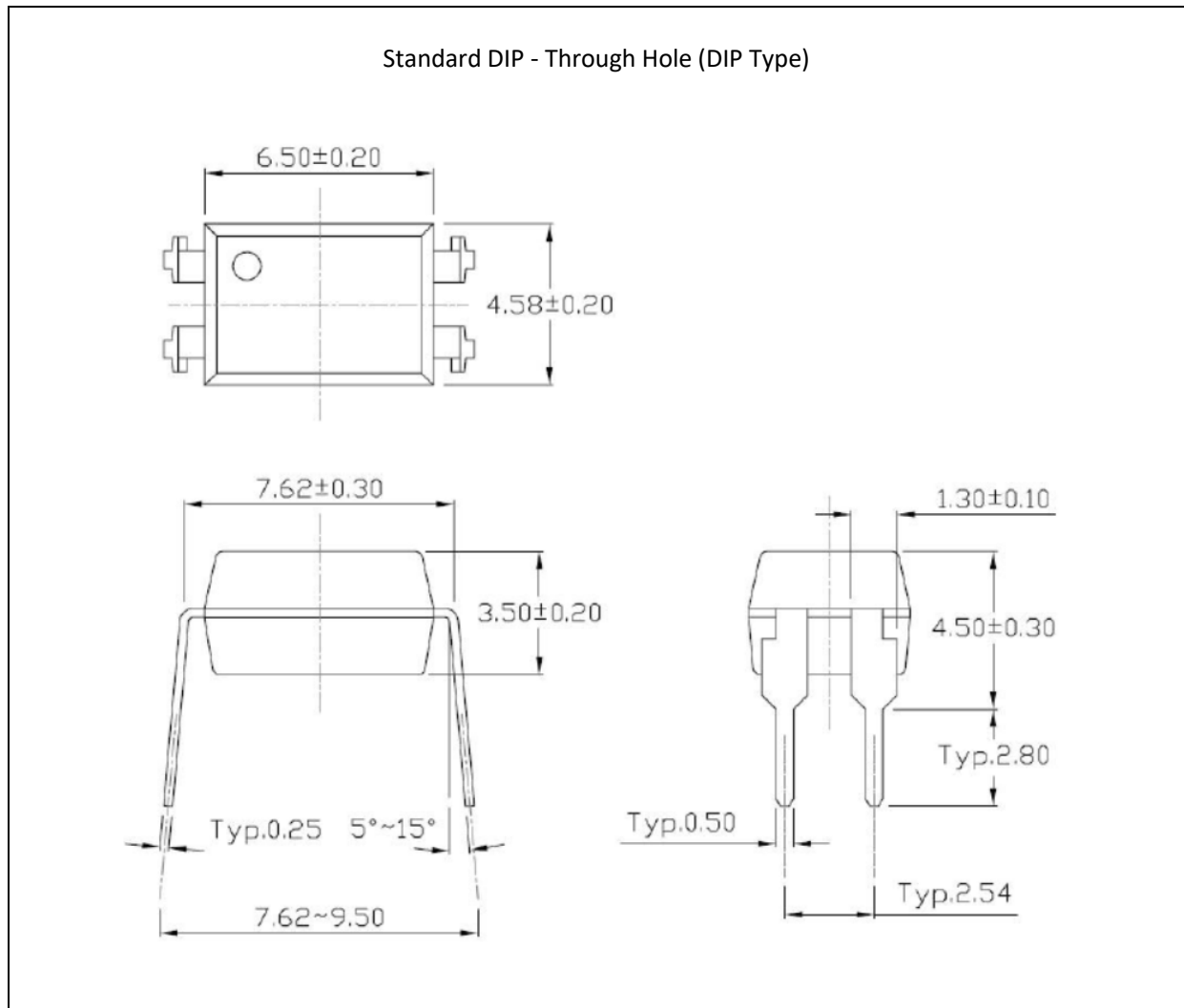


Test Circuit and Waveforms of dv/dt :



OUTLINE DIMENSION:

Package Dimension:

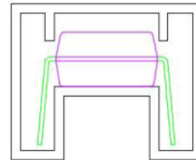
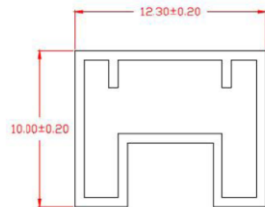


1. All dimensions are in millimetre (mm).

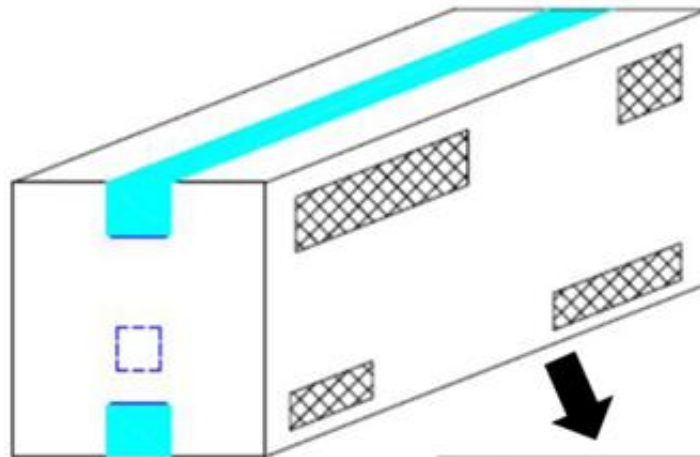
PACKING SPECIFICATION:

Tube Dimension:

100pcs/tube, 32 tube/inner box, 10 inner box (32Kpcs)/carton



● L x W x H = 52.5cm x 10.7cm x 4.7cm



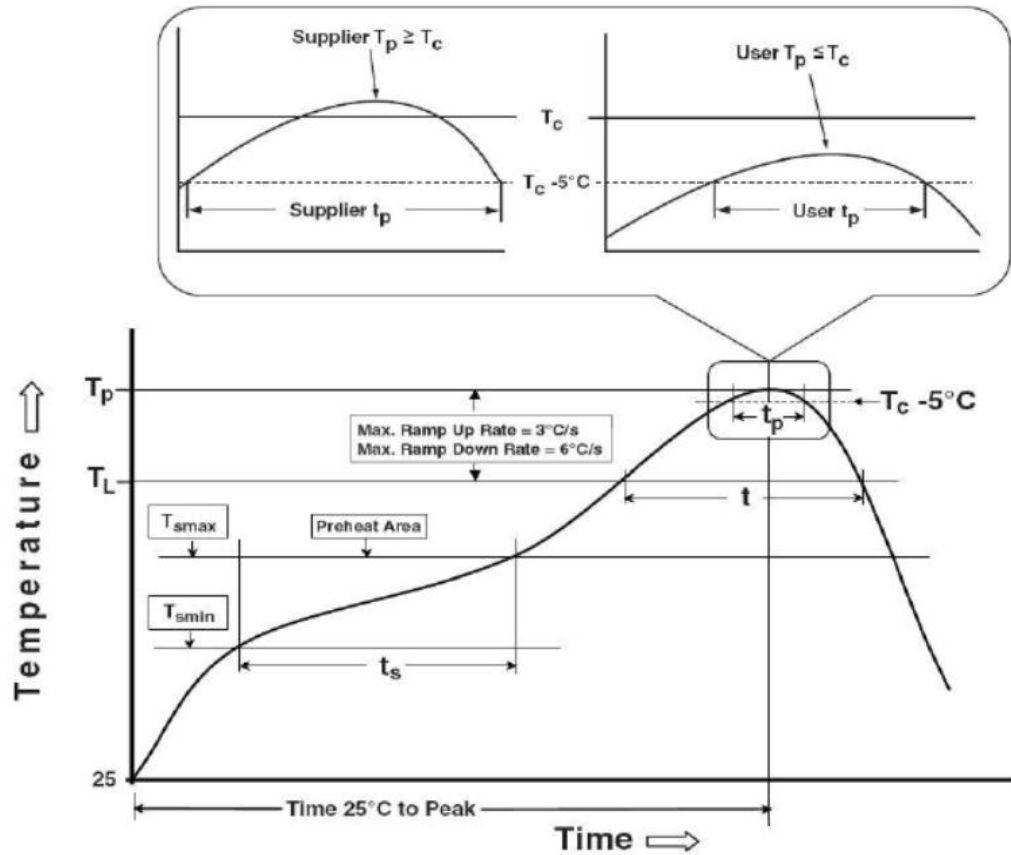
● L x W x H = 53.5cm x 23.5cm x 25.5cm





RECOMMENDED SOLDERING PROFILE:

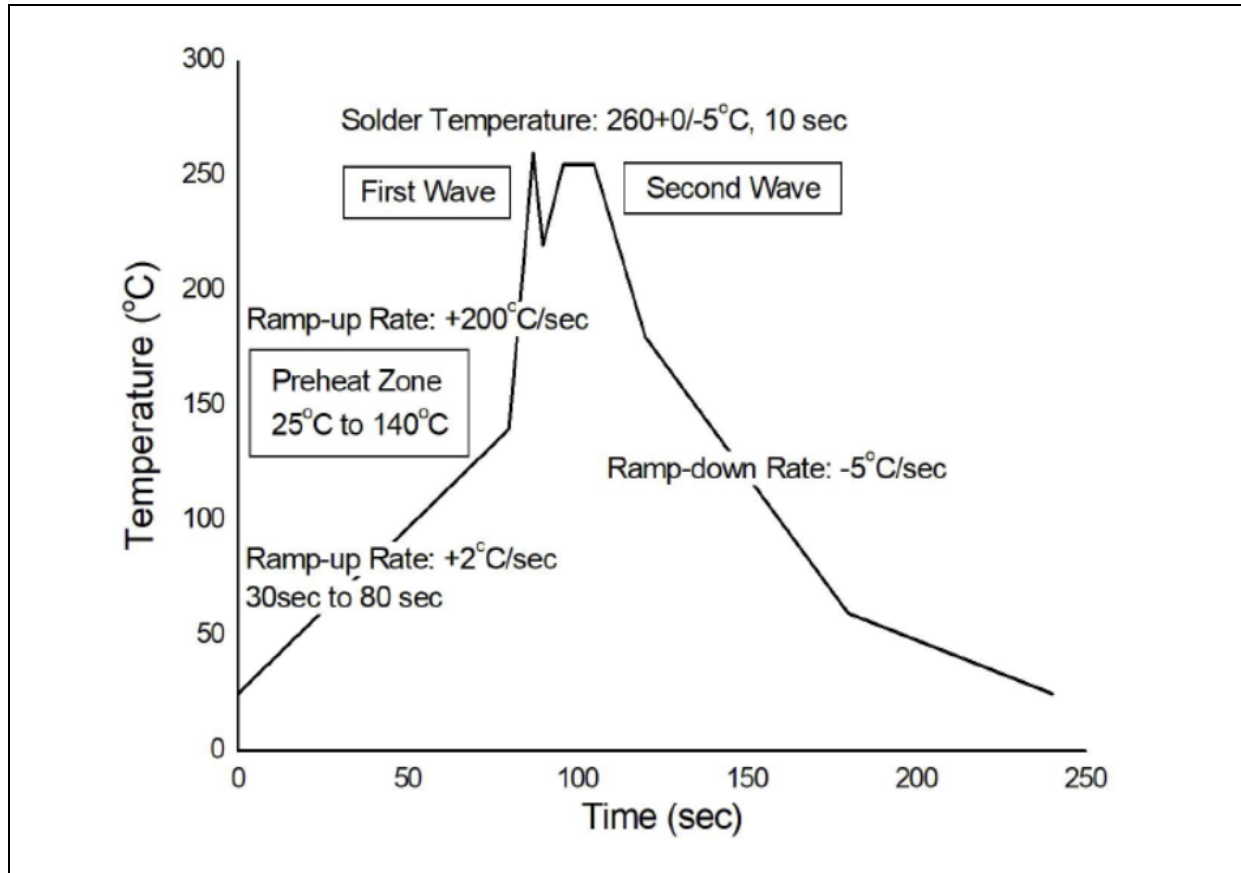
Reflow Information:



| 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.