

### ● Description

The KTLP3503 series consist of a GaAs infrared emitting diode optically coupled to a monolithic silicon detector performing the function of a zero voltage crossing bilateral TRIAC and a main output power TRIAC. They are designed for use with a TRIAC in the interface of logic systems to equipment powered from 115 VAC lines, such as solid-state relays, industrial controls, motors, solenoids and consumer appliances, etc.

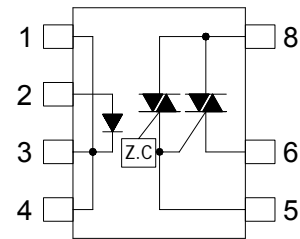
### ● Features

1. Pb free and RoHS compliant
2. 400V peak blocking voltage
3. On-State R.M.S Current 0.5A
4. Simplifies logic control of 115 VAC power
5. Zero voltage crossing
6. Isolation voltage between input and output (Viso : 5300Vms)
7. MSL class 1
8. Agency Approvals :
  - UL Approved (No. E169586): UL1577
  - c-UL Approved (No. E169586)
  - VDE Approved (No. 40020973): DIN EN60747-5-5

### ● Applications

- TRIAC driver
- Programmable controllers
- AC-output module
- Solid state relay
- Isolated interface between high voltage AC devices and lower voltage DC control circuitry
- Switching motors, fans, heaters, solenoids and valves
- Phase or power control in applications, such as lighting and temperature control equipment

### ● Schematic

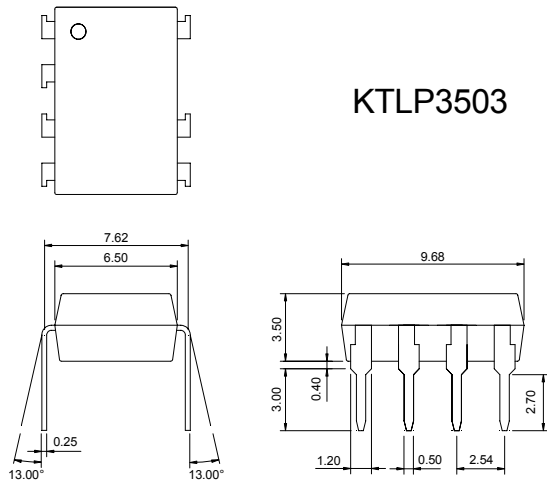


- |            |         |
|------------|---------|
| 1. Cathode | 5. Gate |
| 2. Anode   | 6. T1   |
| 3. Cathode | 8. T2   |
| 4. Cathode |         |

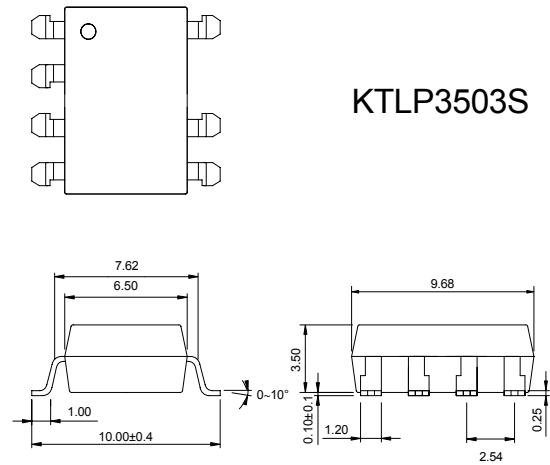
● **Outside Dimension**

Unit : mm

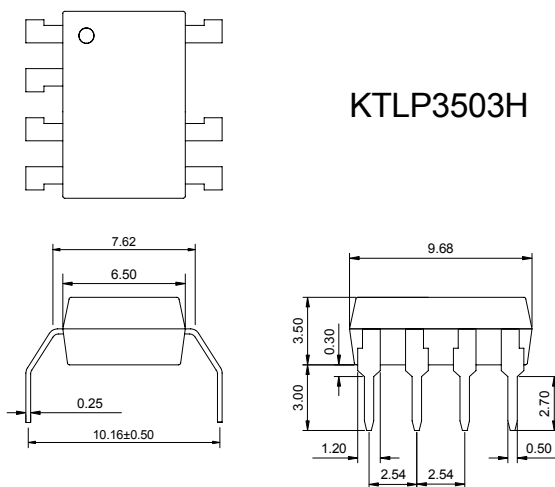
1. Dual-in-line type.



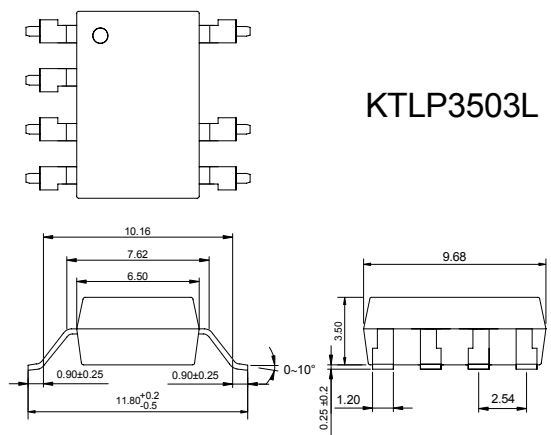
2. Surface mount type.



3. Long creepage distance type.

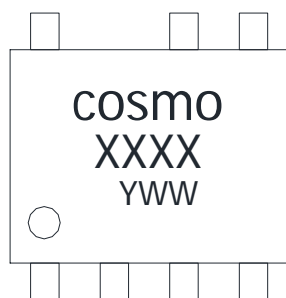


4. Long creepage distance for surface mount type.



TOLERANCE : ±0.2mm

● **Device Marking**



**Notes :**

**cosmo**

XXXX XXXX : 3617 or 3507 or 3503

YWW Y : Year code / W : Week code

**● Absolute Maximum Ratings**

(Ta=25°C)

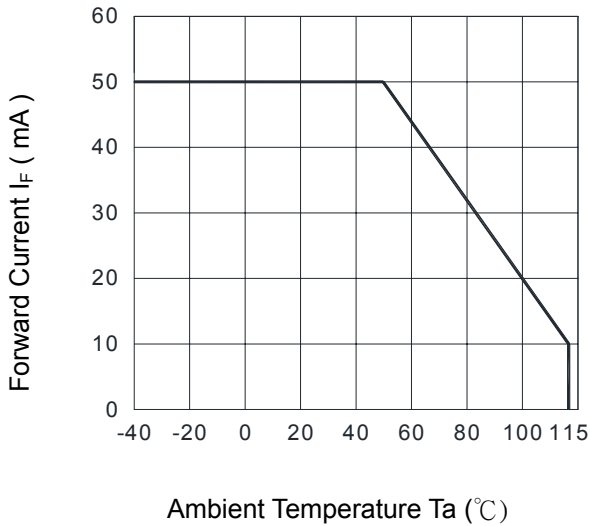
| Parameter                        |   | Symbol       | Rating      | Unit       |
|----------------------------------|---|--------------|-------------|------------|
| Input                            | Forward current                             | $I_F$        | 50          | mA         |
|                                  | Peak forward current                        | $I_{FM}$     | 1           | A          |
|                                  | Reverse voltage                             | $V_R$        | 6           | V          |
|                                  | Power dissipation                           | $P_D$        | 70          | mW         |
| Output                           | Off-state output terminal voltage           | $V_{DRM}$    | 400         | $V_{PEAK}$ |
|                                  | On-state R.M.S. current                     | $I_{T(RMS)}$ | 0.5         | A          |
|                                  | Peak repetitive surge current (60Hz , Peak) | $I_{TSM}$    | 5           | A          |
| Isolation voltage 1 minute       |   | $V_{iso}$    | 5300        | $V_{rms}$  |
| Operating temperature            |   | $T_{opr}$    | -40 to +115 | °C         |
| Storage temperature              |   | $T_{stg}$    | -50 to +125 | °C         |
| Soldering temperature 10 seconds |   | $T_{sol}$    | 260         | °C         |

**● Electro-optical Characteristics**

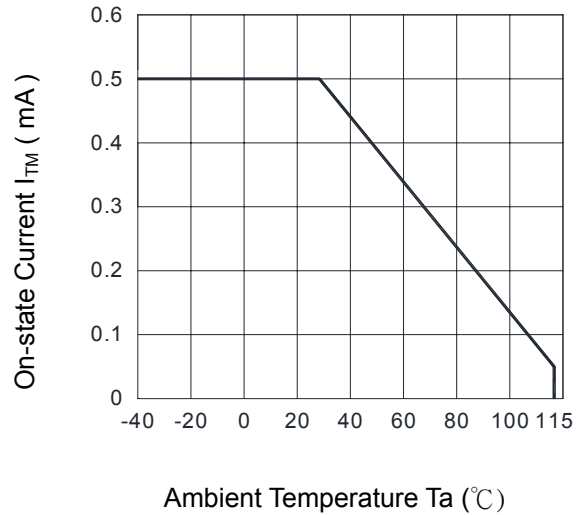
(Ta=25°C)

| Parameter                |   | Symbol     | Conditions  | Min.               | Typ. | Max. | Unit      |
|--------------------------|---|------------|---|--------------------|------|------|-----------|
| Input                    | Forward voltage   | $V_F$      | $I_F=10mA$  | -                  | 1.2  | 1.4  | V         |
|                          | Reverse current   | $I_R$      | $V_R=4V$  | -                  | -    | 10   | $\mu A$   |
| Output                   | Peak blocking current   | $I_{DRM}$  | $V_{DRM}$ Rated   | -                  | -    | 100  | $\mu A$   |
|                          | On-state voltage  | $V_{TM}$   | $I_{TM}=0.5A$   | -                  | -    | 3    | V         |
| Transfer characteristics | Holding current   | $I_H$      |   | -                  | -    | 25   | mA        |
|                          | Critical rate of rise of off-state voltage                            | $dv/dt$    | $V_{DRM}=(1/\sqrt{2})*\text{Rated}$                                     | 200                | -    | -    | $V/\mu s$ |
|                          | Inhibit voltage (MT1-MT2 voltage above which device will not trigger) | $V_{INH}$  | $I_F = \text{Rated } I_{FT}$  | -                  | -    | 50   | V         |
|                          | Leakage in inhibited state  | $I_{DRM2}$ | $I_F = \text{Rated } I_{FT}, \text{ Rated } V_{DRM}, \text{ Off State}$ | -                  | 200  | -    | $\mu A$   |
|                          | Isolation resistance  | $R_{iso}$  | DC500V  | $5 \times 10^{10}$ | -    | -    | $\Omega$  |
|                          | Minimum trigger current   | $I_{FT}$   | Main terminal voltage=3V  | -                  | -    | 10   | mA        |

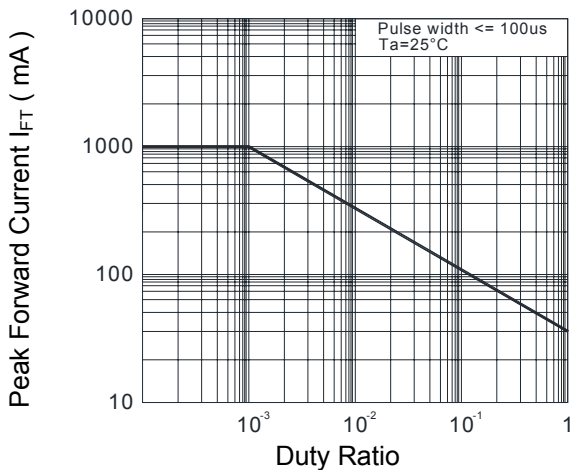
**Fig.1 Forward Current  $I_F$  vs. Ambient Temperature**



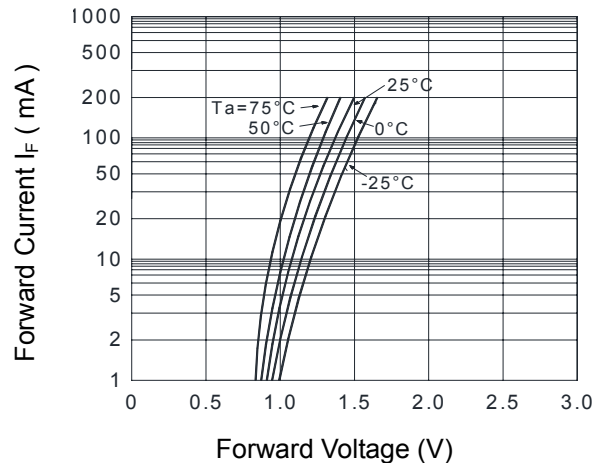
**Fig.2 On-State R.M.S. Current  $I_{TM}$  vs. Ambient Temperature**



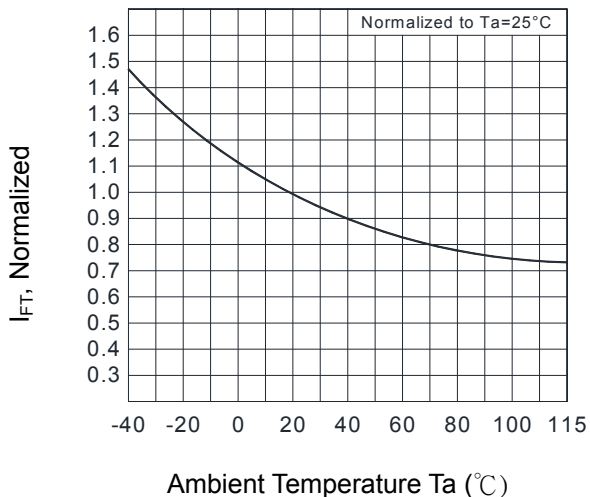
**Fig.3 Peak Forward Current  $I_{FT}$  vs. Duty Ratio**



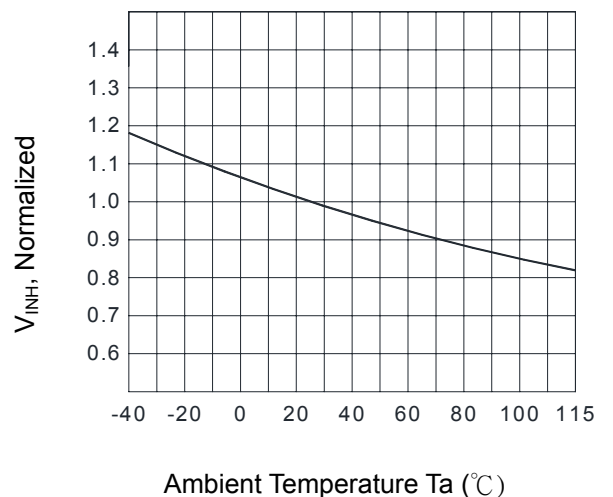
**Fig.4 Forward Current  $I_F$  vs. Forward Voltage**



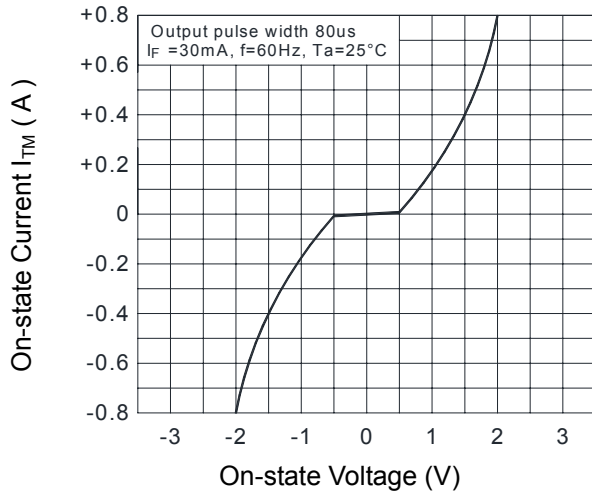
**Fig.5 Trigger Current  $I_{FT}$  vs. Ambient Temperature**



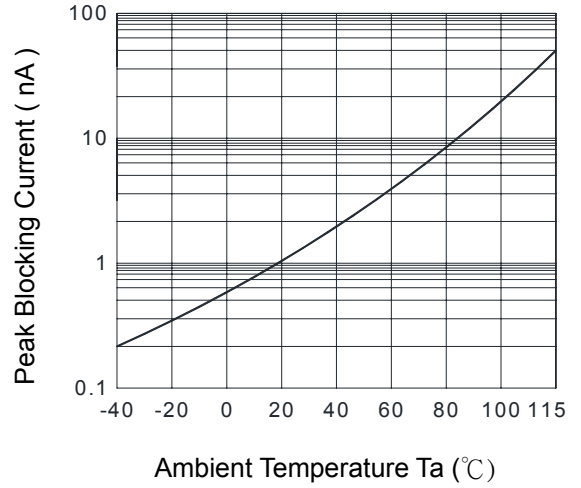
**Fig.6 Inhibited Voltage  $V_{INH}$  vs. Ambient Temperature**



**Fig.7 On-state Characteristics**



**Fig.8 Leakage with LED off vs. Ambient Temperature**

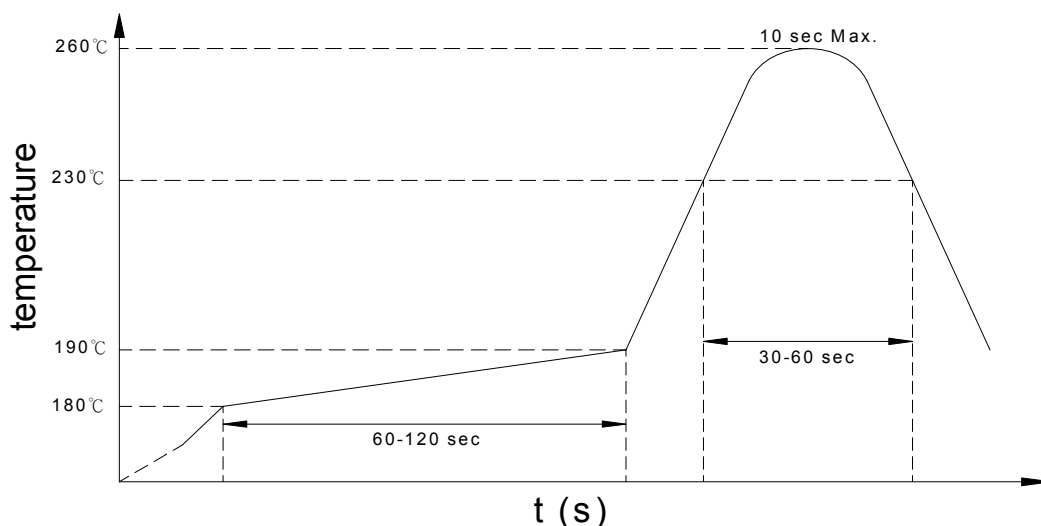


### ● Recommended Soldering Conditions

#### (a) Infrared reflow soldering :

- Peak reflow soldering : 260°C or below (package surface temperature)
- Time of peak reflow temperature : 10 sec
- Time of temperature higher than 230°C : 30-60 sec
- Time to preheat temperature from 180~190°C : 60-120 sec
- Time(s) of reflow : Two
- Flux : Rosin flux containing small amount of chlorine (The flux with a maximum chlorine content of 0.2 Wt% is recommended.)

#### Recommended Temperature Profile of Infrared Reflow



#### (b) Wave soldering :

- Temperature : 260°C or below (molten solder temperature)
- Time : 10 seconds or less
- Preheating conditions : 120°C or below (package surface temperature)
- Time(s) of reflow : One
- Flux : Rosin flux containing small amount of chlorine (The flux with a maximum chlorine content of 0.2 Wt% is recommended.)

#### (c) Cautions :

- Fluxes : Avoid removing the residual flux with freon-based and chlorine-based cleaning solvent.
- Avoid shorting between portion of frame and leads.

● **Numbering System**

## KTLP3503 X (Y)

**Notes :**

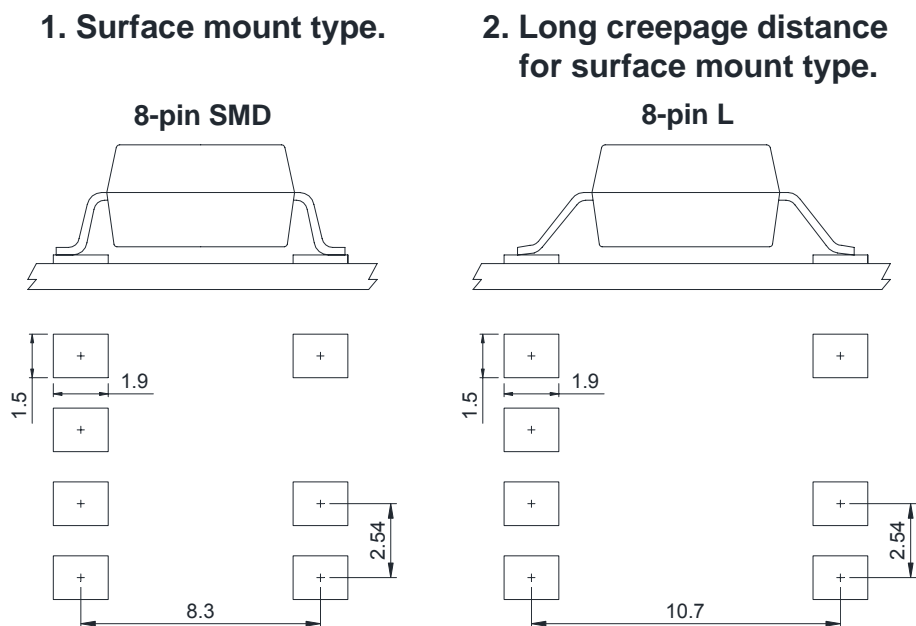
KTLP3503 = Part No.

X = Lead form option ( blank 、 S 、 H 、 L )

Y = Tape and reel option ( TL 、 TR 、 TLD 、 TRU )

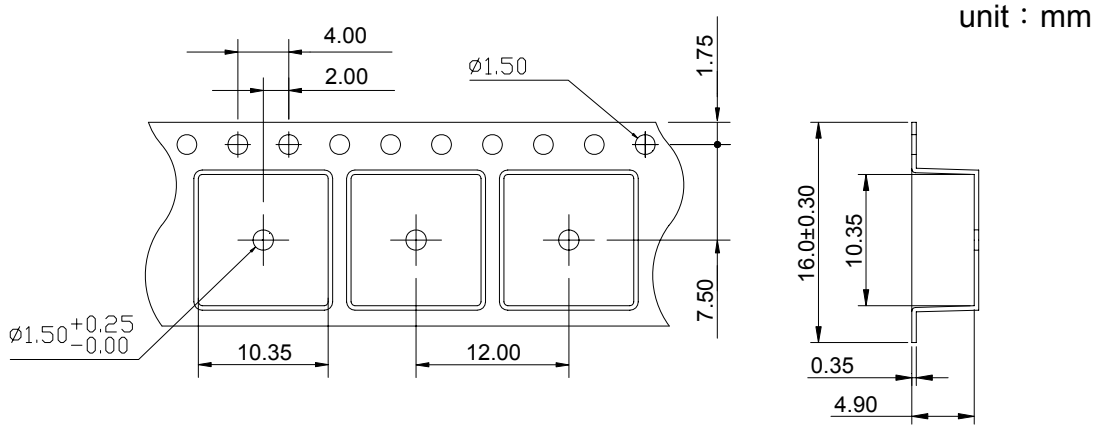
| Option  | Description  | Packing quantity    |
|---------|--|---------------------|
| S (TL)  | surface mount type package + TL tape & reel option                             | 1000 units per reel |
| S (TR)  | surface mount type package + TR tape & reel option                             | 1000 units per reel |
| L (TLD) | long creepage distance for surface mount type package + TLD tape & reel option | 800 units per reel  |
| L (TRU) | long creepage distance for surface mount type package + TRU tape & reel option | 800 units per reel  |

● **Recommended Pad Layout for Surface Mount Lead Form**



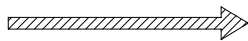
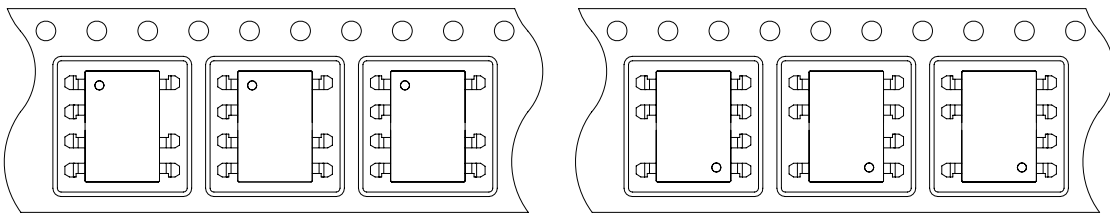
Unit : mm

● SMD Carrier Tape & Reel

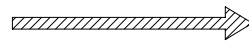


TL

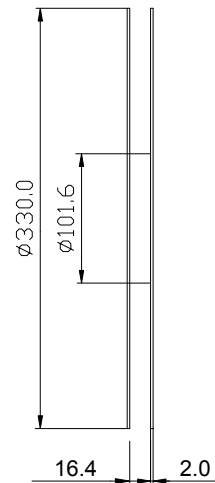
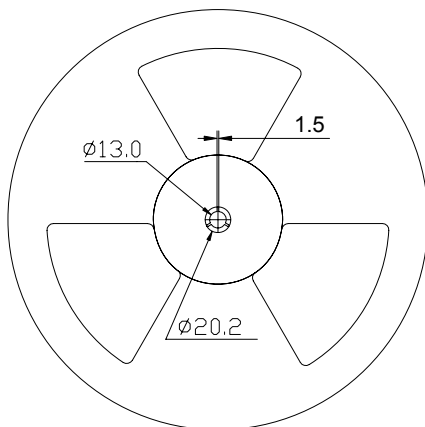
TR



Direction of feed from reel

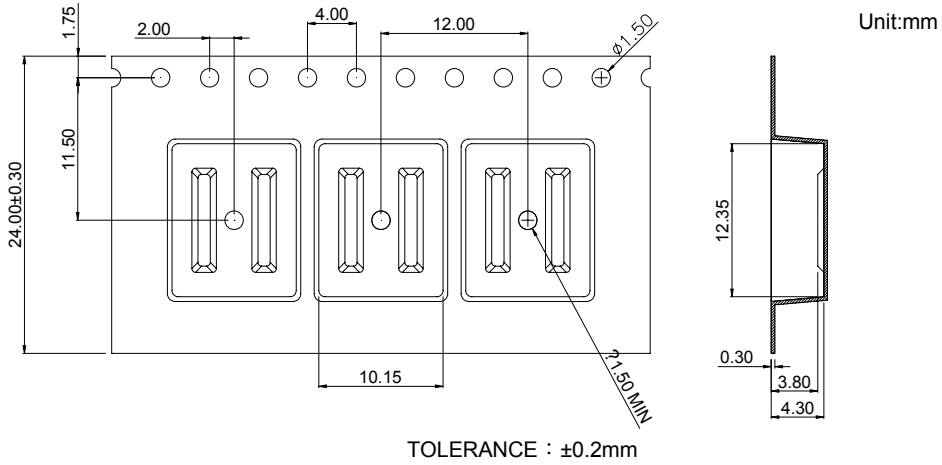


Direction of feed from reel



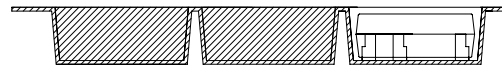
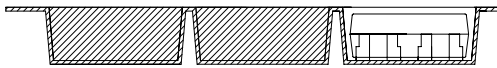
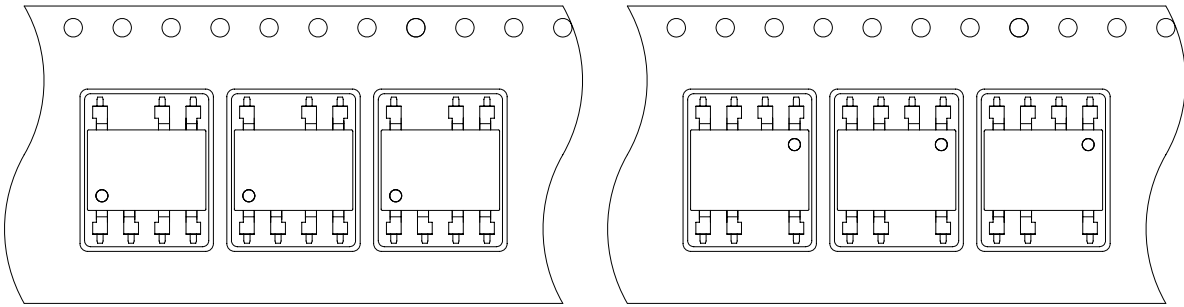


● L Carrier tape & Reel



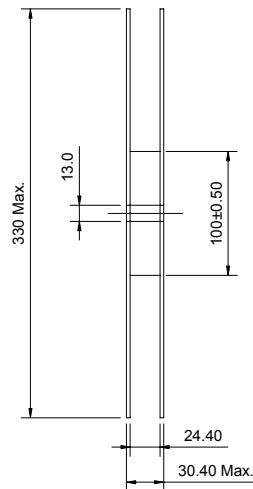
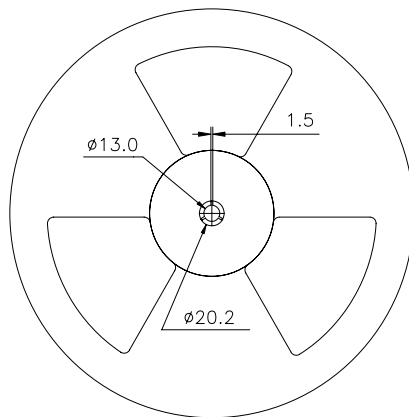
TLD

TRU



Direction of feed from reel

Direction of feed from reel





# KTLP3617 (3507), (3503) Series

## 8PIN ZERO-CROSS TRIAC DRIVER PHOTOCOUPLER

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### ● Application Notice

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