

● 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.

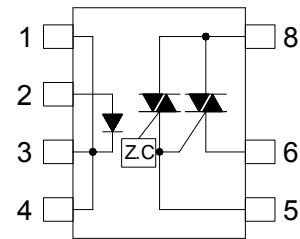
● Features

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. Agency Approvals :
 - UL1577, File No. E169586
 - CUL C22.2 No.1 & NTC No.5, File No. E169586
 - VDE EN60747-5-2 , File No. 40020973

● 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

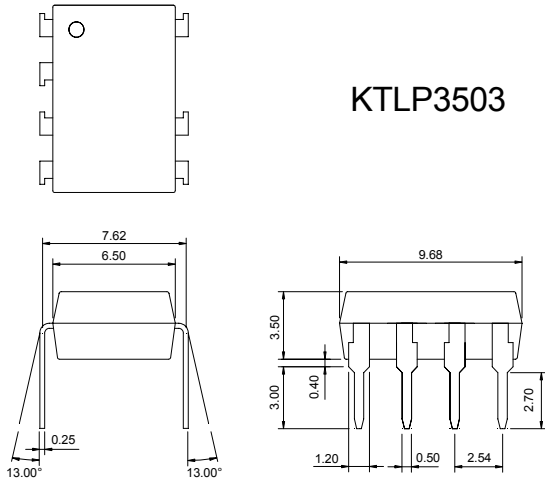


- | | |
|------------|---------|
| 1. Cathode | 5. Gate |
| 2. Anode | 6. T1 |
| 3. Cathode | 8. T2 |
| 4. Cathode | |

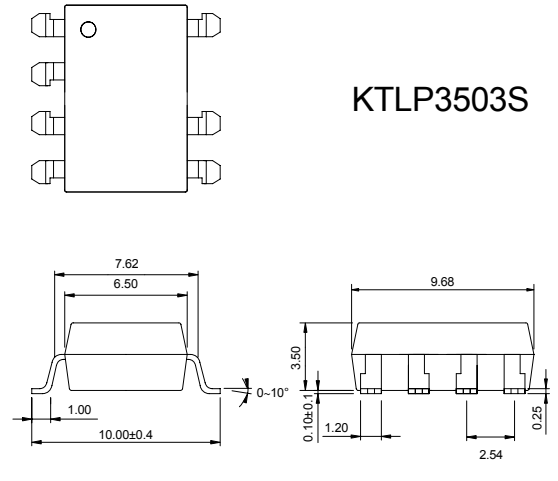
● **Outside Dimension**

Unit : mm

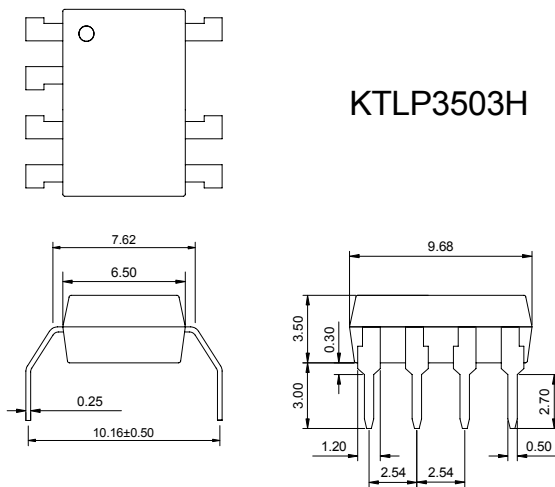
1. Dual-in-line type.



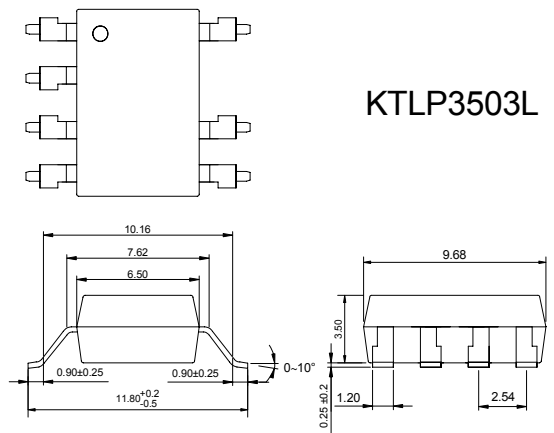
2. Surface mount type.



3. Long creepage distance type.

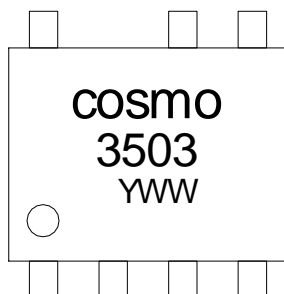


4. Long creepage distance for surface mount type.



TOLERANCE : ±0.2mm

● **Device Marking**



Notes :

cosmo
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	μA
Output	Peak blocking current	I_{DRM}	V_{DRM} Rated	-	-	100	μA
	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	$V_{DRM}=(1/\sqrt{2})*\text{Rated}$	-	1000	-	$V/\mu s$
	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	-	μA
	Isolation resistance	R_{iso}	DC500V	5×10^{10}	-	-	Ω
	Minimum trigger current	I_{FT}	Main terminal voltage=3V	-	-	10	mA

Fig.1 Forward Current I_F vs. Ambient Temperature

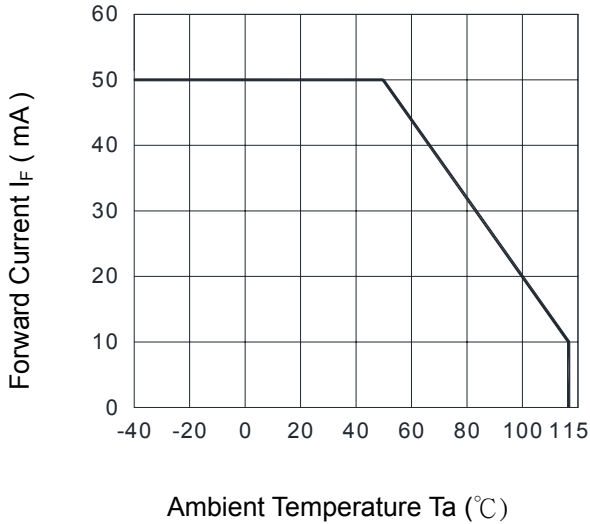


Fig.2 On-State R.M.S. Current I_{TM} vs. Ambient Temperature

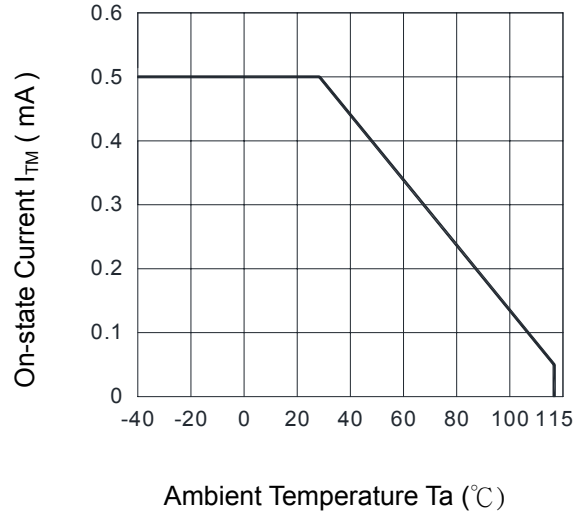


Fig.3 Peak Forward Current I_{FT} vs. Duty Ratio

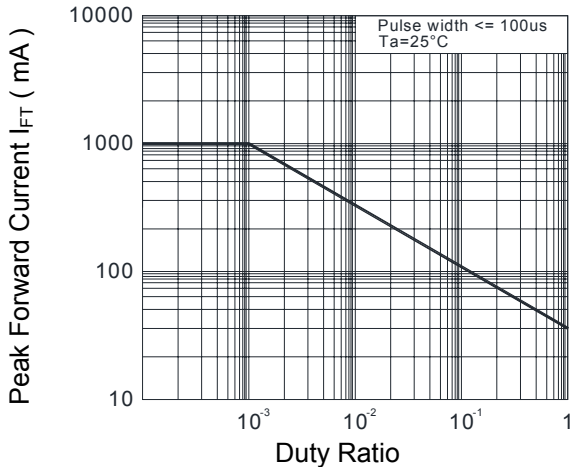


Fig.4 Forward Current I_F vs. Forward Voltage

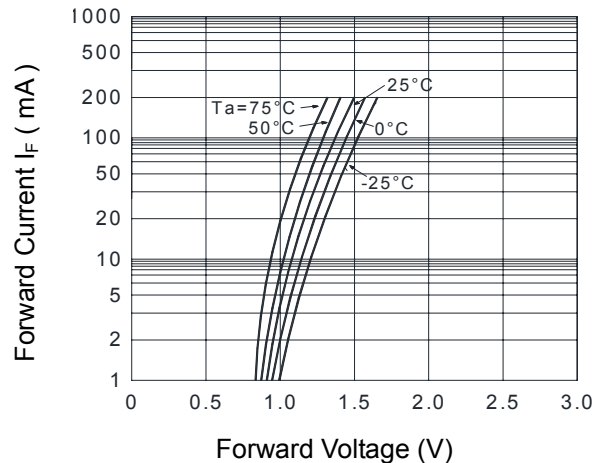


Fig.5 Trigger Current I_{FT} vs. Ambient Temperature

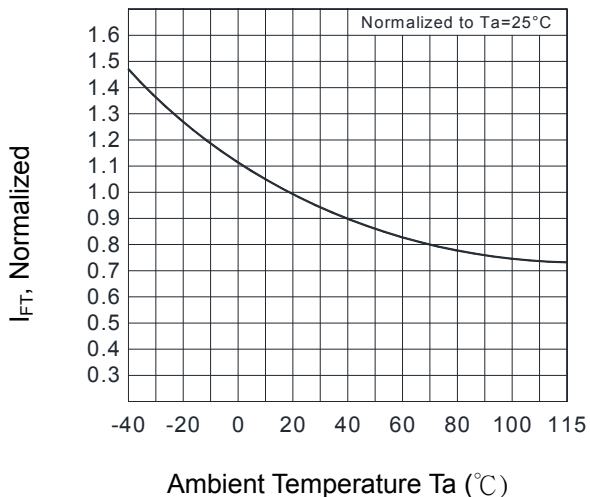


Fig.6 Inhibited Voltage V_{INH} vs. Ambient Temperature

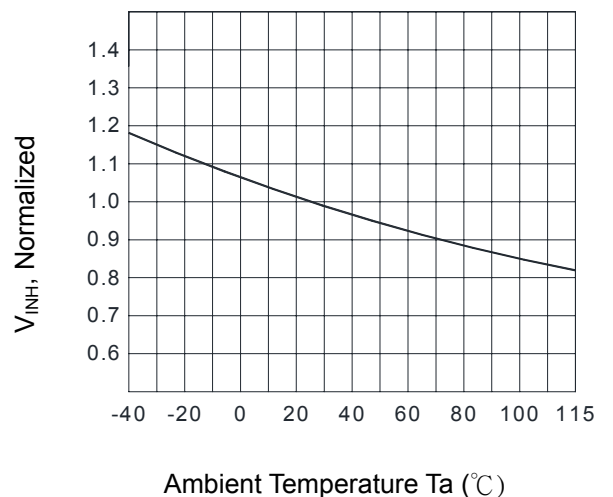


Fig.7 On-state Characteristics

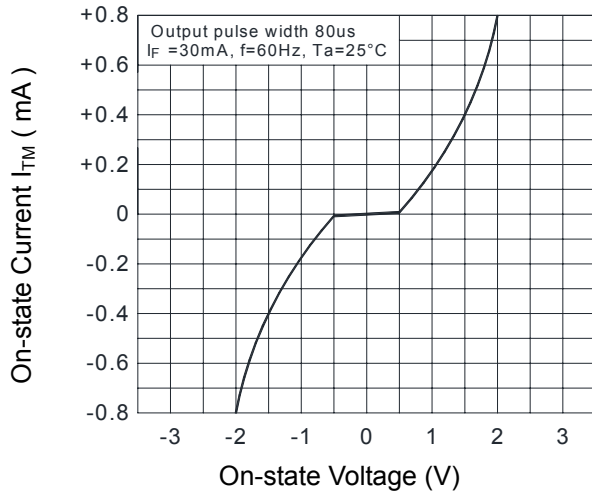
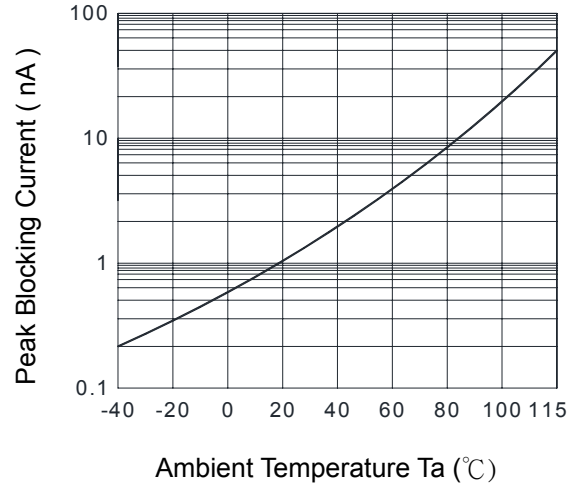


Fig.8 Leakage with LED off vs. Ambient Temperature

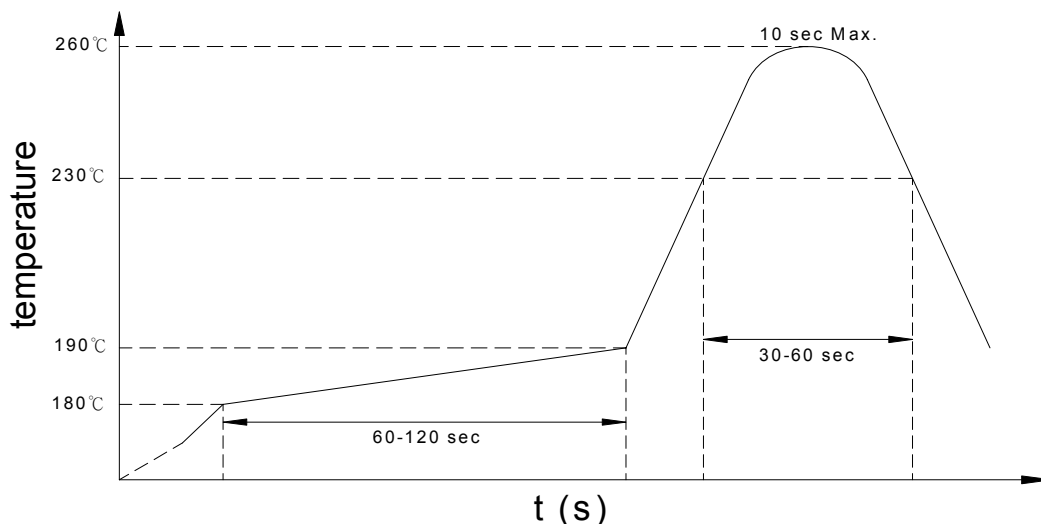


● Recommended Soldering Conditions

(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 :

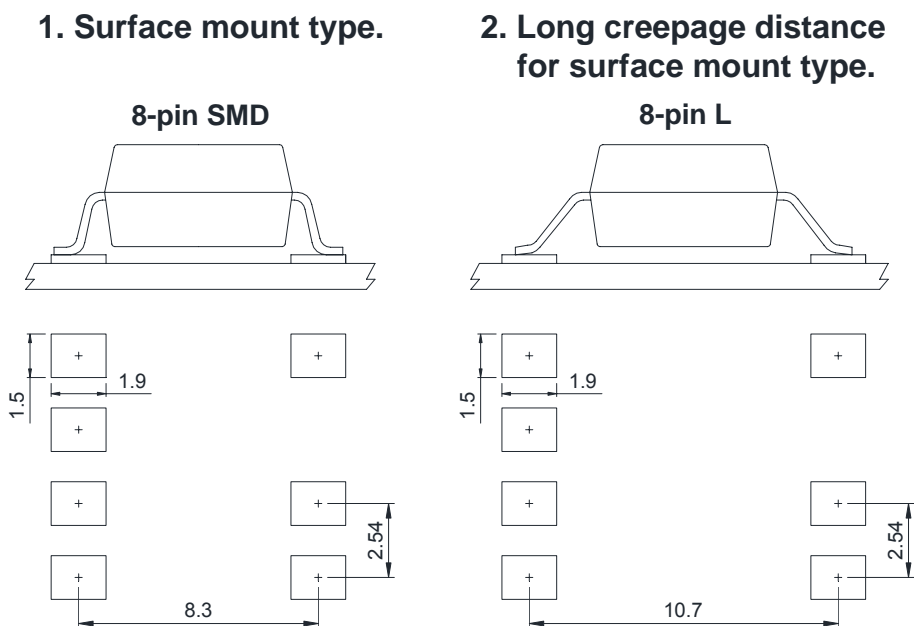
KTLP3503 = Part No.

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

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

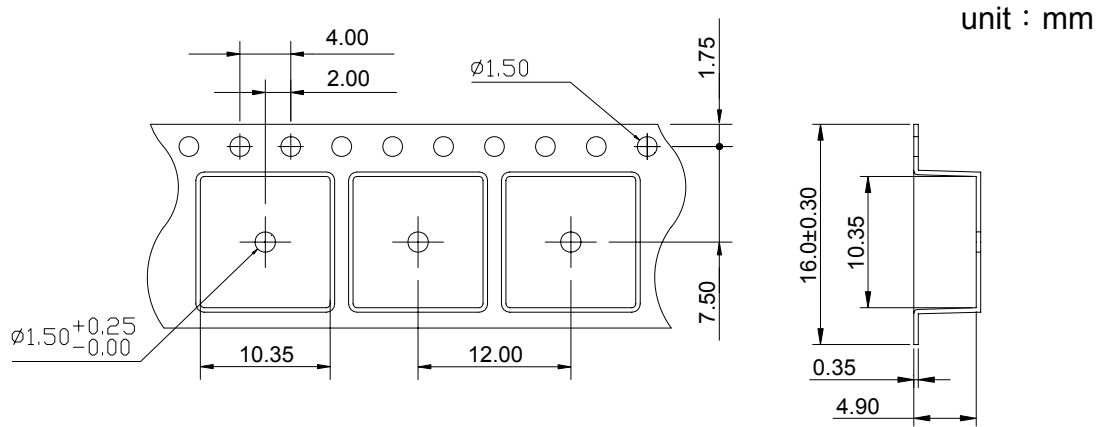
Option	Description	Packing quantity
S (TL)	surface mount type package + TL tape & reel option	1000 units per reel
S (TR)	surface mount type package + TR tape & reel option	1000 units per reel
L (TLD)	long creepage distance for surface mount type package + TLD tape & reel option	800 units per reel
L (TRU)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

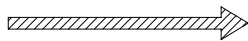
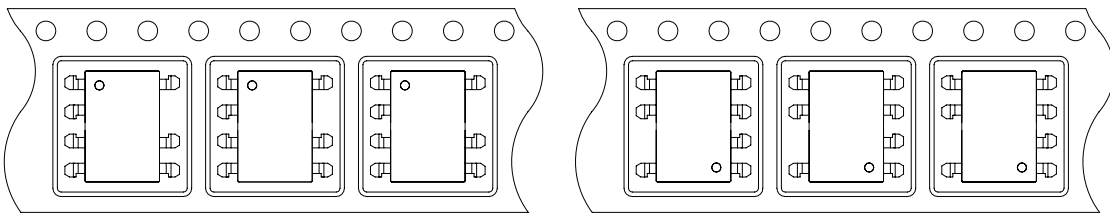
● SMD Carrier Tape & Reel



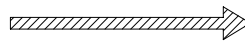
TOLERANCE : ± 0.2 mm

TL

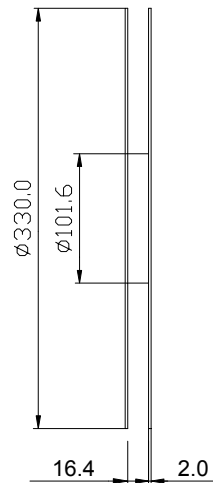
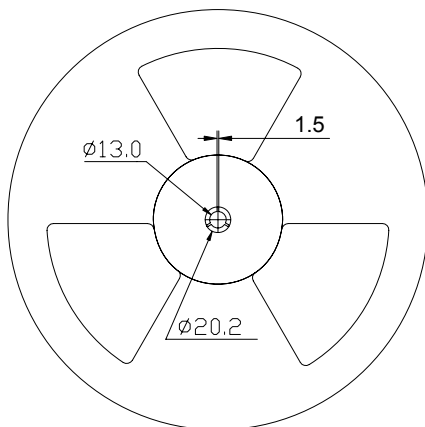
TR



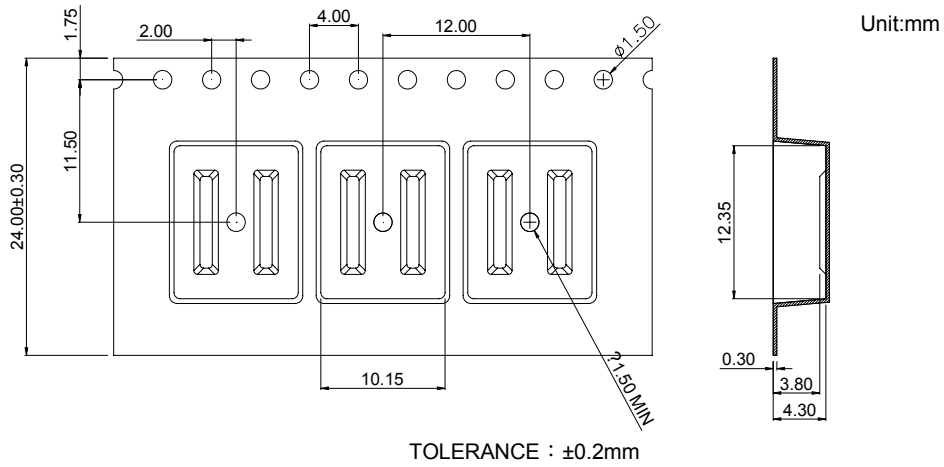
Direction of feed from reel



Direction of feed from reel

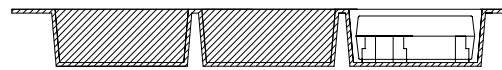
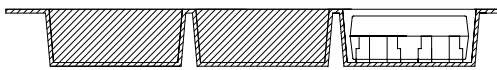
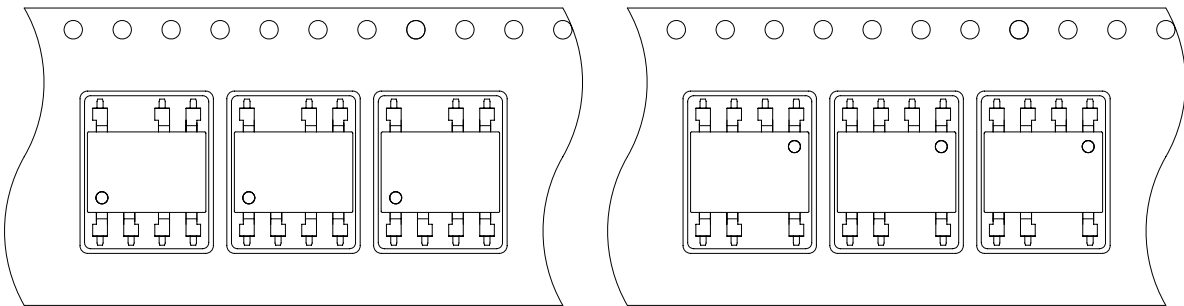


● L Carrier tape & Reel



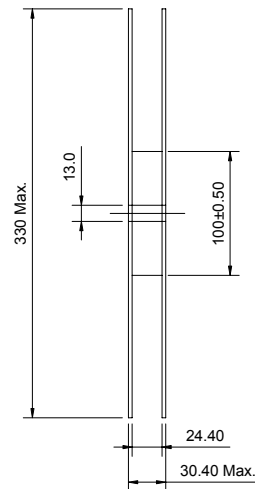
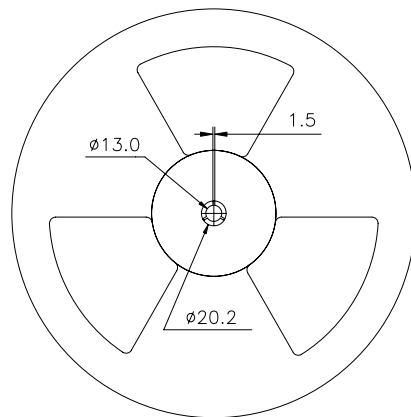
TLD

TRU



Direction of feed from reel

Direction of feed from reel





KTLP3503 Series

8PIN ZERO-CROSS TRIAC DRIVER PHOTOCOUPLER

● Application Notice

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- d. Instrumentation
- e. Electrical application
- f. Measurement equipment
- g. Consumer electronics
- h. Telecommunication

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- e. Equipment used for automotive vehicles, trains, ships...etc.

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