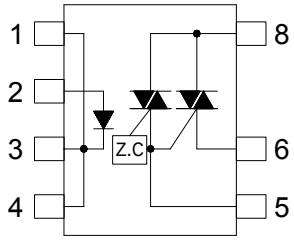
KTLP3617 (3507), (3503) Series

8PIN ZERO-CROSS TRIAC DRIVER PHOTOCOUPLER

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.

Schematic



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

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

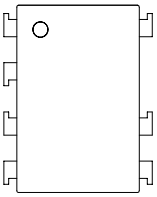
Applications

- 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

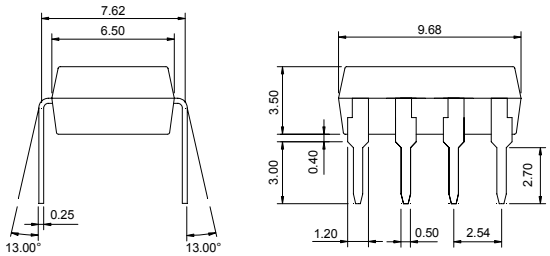
● Outside Dimension

Unit：mm

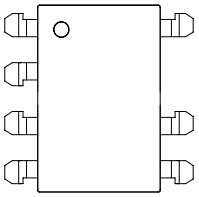
1. Dual-in-line type.



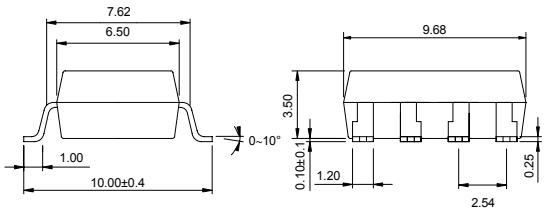
KTLP3503



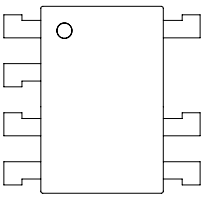
2. Surface mount type.



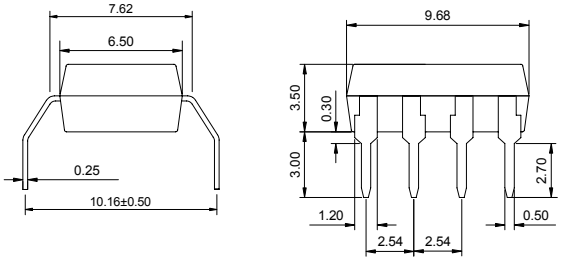
KTLP3503S



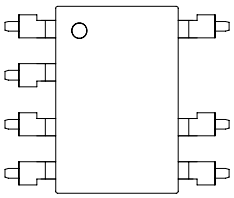
3. Long creepage distance type.



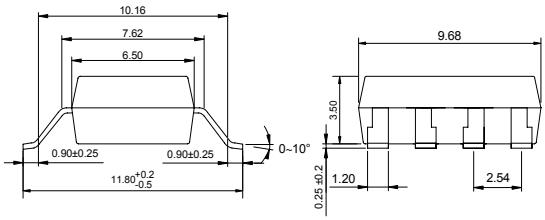
KTLP3503H



4. Long creepage distance for surface mount type.

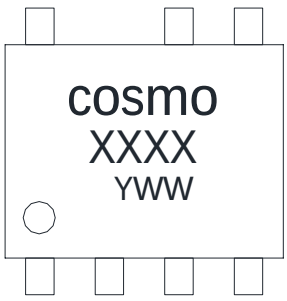


KTLP3503L



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℃)

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	Vrms
Operating temperature		T_{opr}	-40 to +115	℃
Storage temperature		T_{stg}	-50 to +125	℃
Soldering temperature 10 seconds		T_{sol}	260	℃

● Electro-optical Characteristics

(Ta=25℃)

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 charac-teristics	Holding current	I_H		-	-	25	mA
	Critical rate of rise of off-state voltage	dv/dt	V_{DRM}=(1/$\sqrt{2}$)*Rated	200	-	-	V/μs
	Inhibit voltage (MT1-MT2 voltage above which device will not trigger)	V_{INH}	I_F= Rated I_{FT}	-	-	50	V
	Leakage in inhibited state	I_{DRM2}	I_F=Rated I_{FT}, Rated V_{DRM}, Off State	-	200	-	μA
	Isolation resistance	R_{iso}	DC500V	$5x10^{10}$	-	-	Ω
	Minimum trigger current	I_{FT}	Main terminal voltage=3V	-	-	10	mA

Fig.1 Forward Current e vs. Ambient Temperature

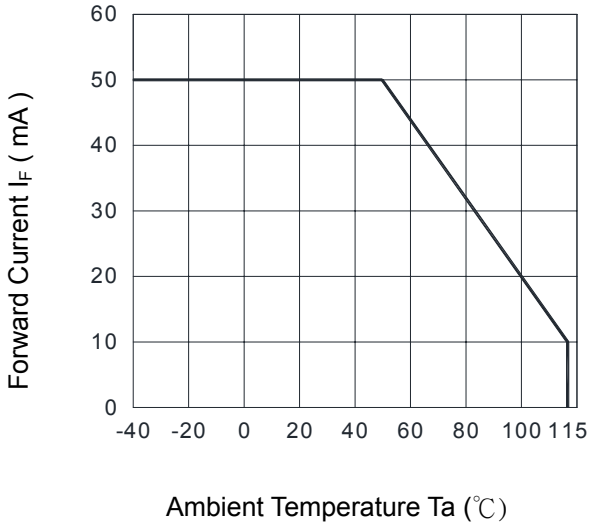


Fig.2 On-State R.M.S. Current vs. Ambient Temperature

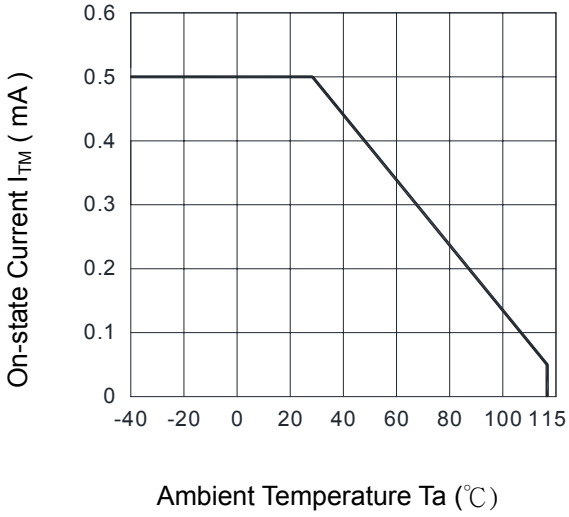


Fig.3 Peak Forward Current vs. Duty Ratio

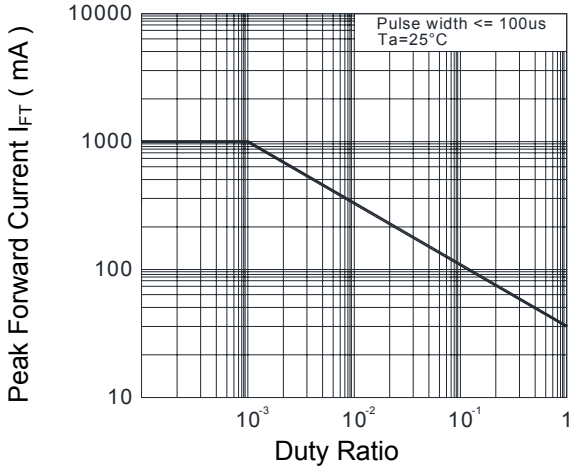


Fig.4 Forward Current vs. Forward Voltage

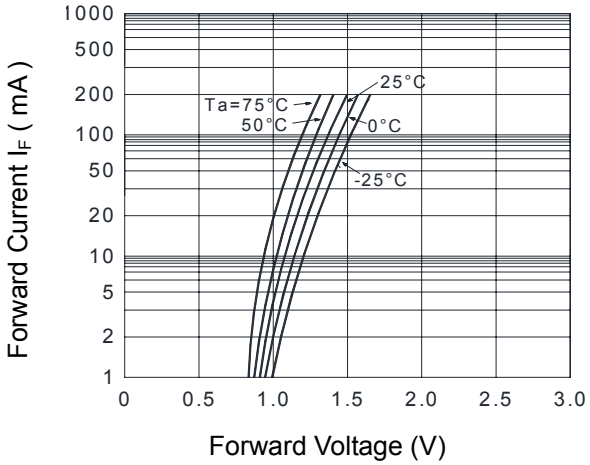


Fig.5 Trigger Current vs. Ambient Temperature

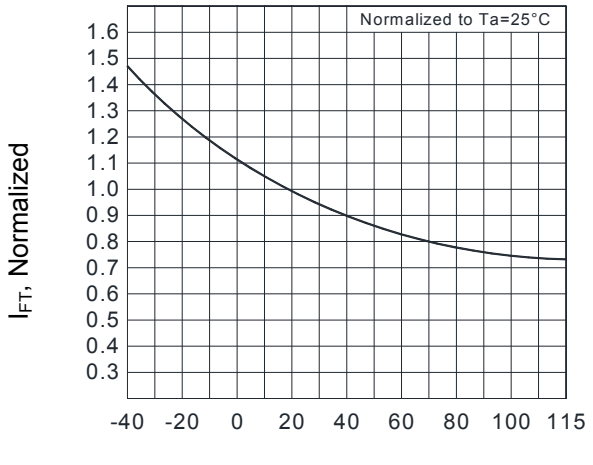


Fig.6 Inhibited Voltage vs. Ambient Temperature

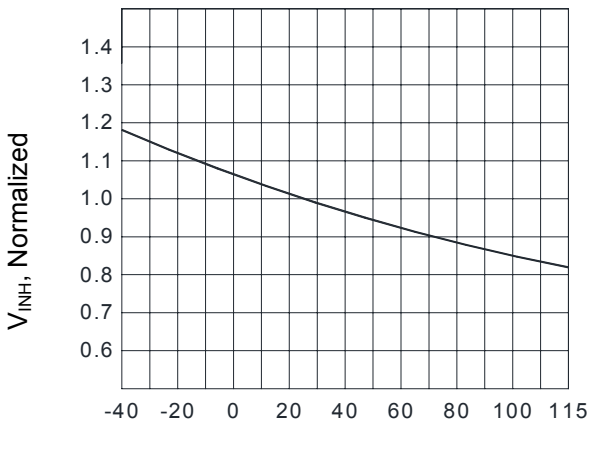


Fig.7 On-state Characteristics

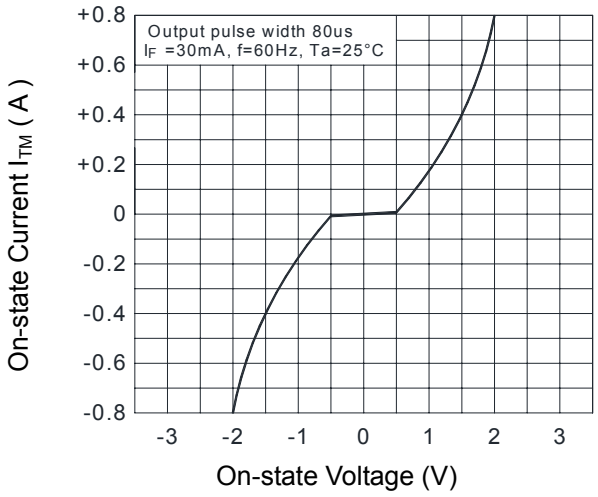
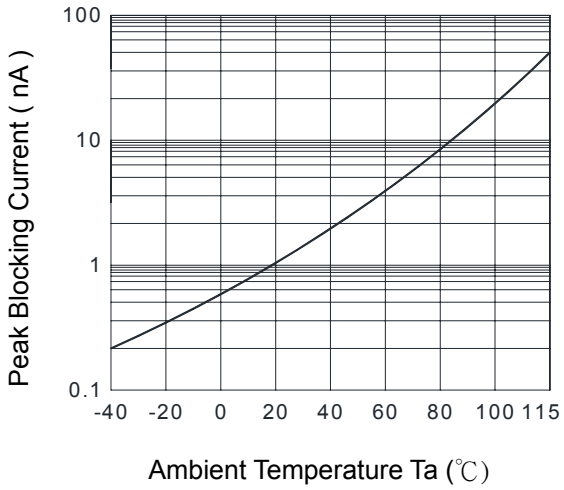


Fig.8 Leakage with LED off vs. Ambient Temperature

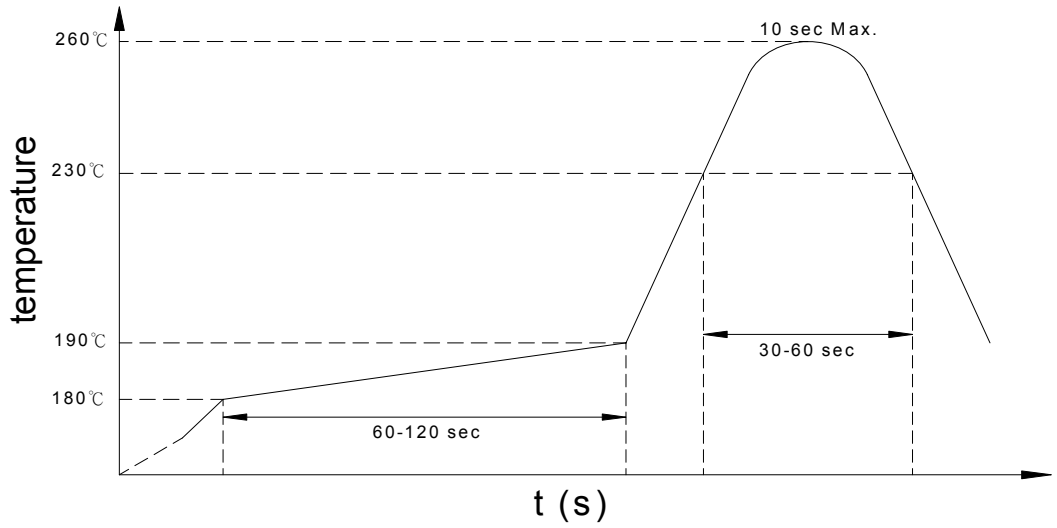


Recommended Soldering Conditions

(a) Infrared reflow soldering：

- Peak reflow soldering： 260℃ or below (package surface temperature)
- Time of peak reflow temperature： 10 sec
- Time of temperature higher than 230℃： 30-60 sec
- Time to preheat temperature from 180~190℃： 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℃ or below (molten solder temperature)
- Time： 10 seconds or less
- Preheating conditions： 120℃ 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)

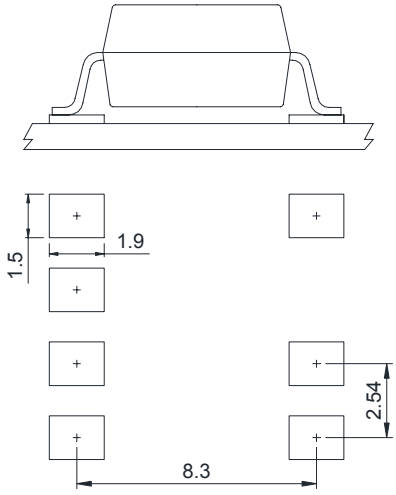
Y = Tape and reel option (TL、TR、TLD、TRU)

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**

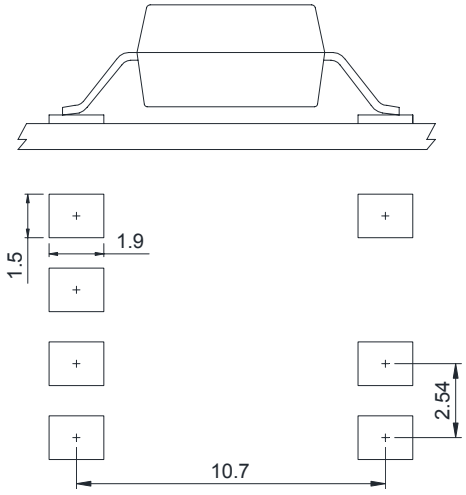
1. Surface mount type.

8-pin SMD



2. Long creepage distance for surface mount type.

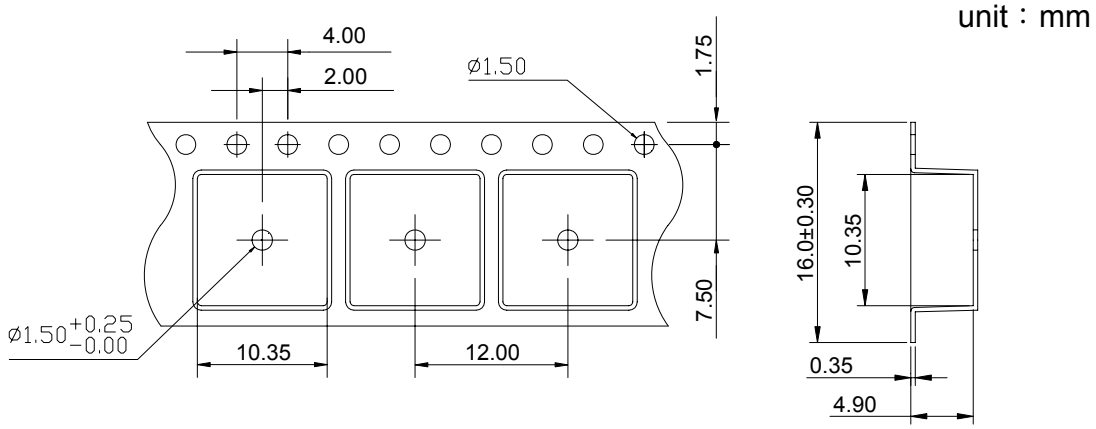
8-pin L



Unit：mm

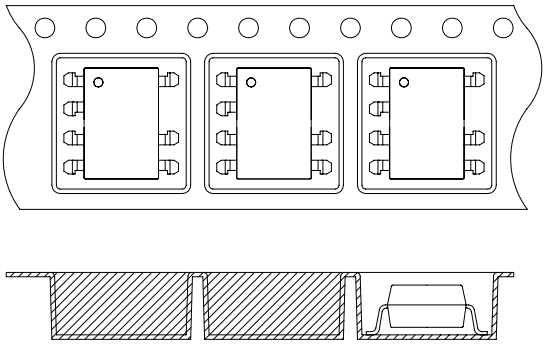
- **SMD Carrier Tape & Reel**

unit：mm

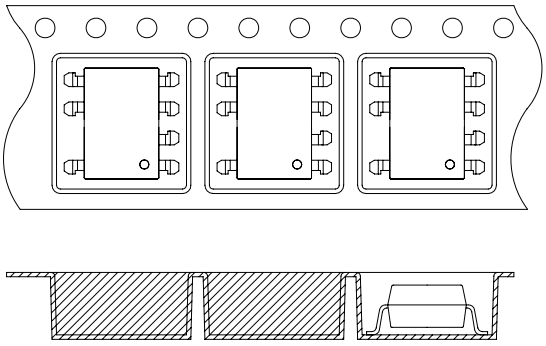


TOLERANCE：±0.2mm

TL

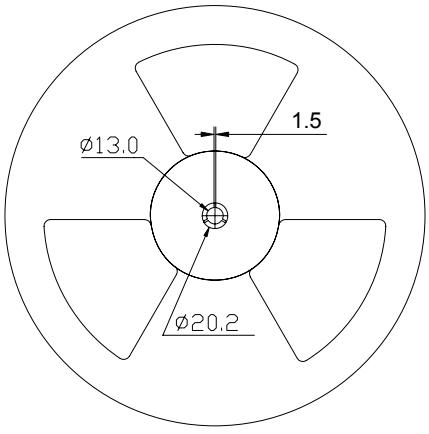


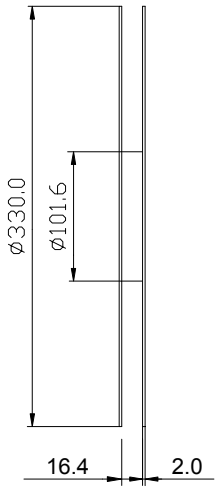
TR



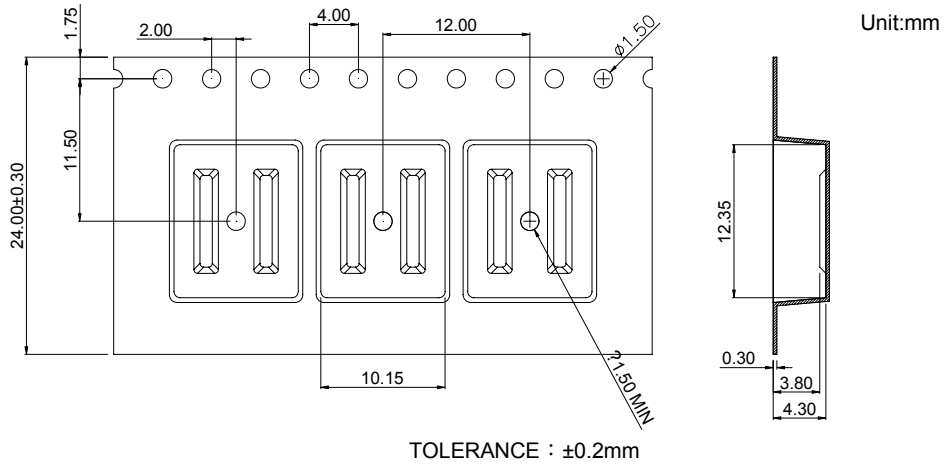
Direction of feed from reel

Direction of feed from reel



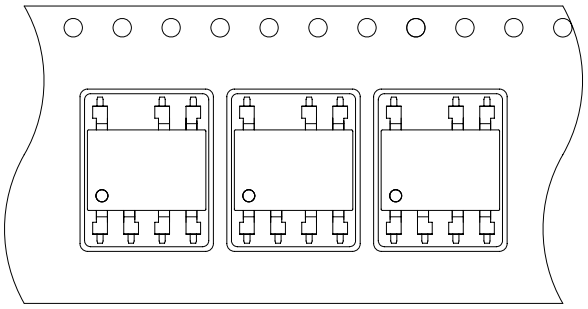


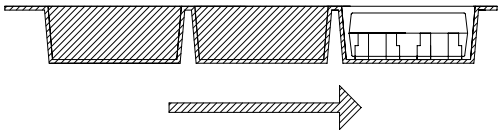
● L Carrier tape & Reel



TOLERANCE：±0.2mm

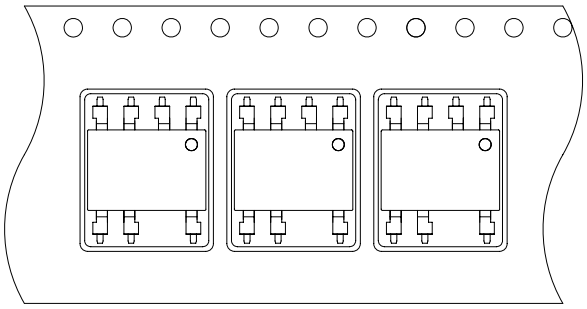
TLD

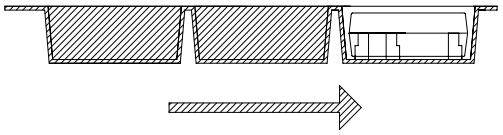




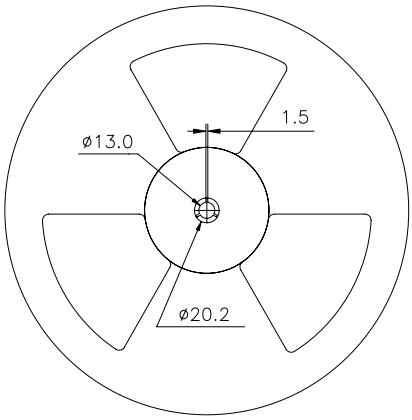
Direction of feed from reel

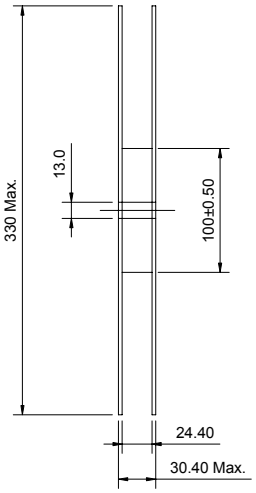
TRU





Direction of feed from reel





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