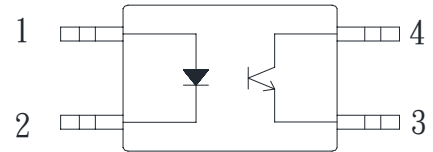


### ● Description

The KT101X series consist of an infrared emitting diode, optically coupled to a phototransistor detector, and is incorporated in a 4 pin LSOP wide body package. It features a high current transfer ratio, low coupling capacitance and high isolation voltage.

### ● Schematic



1. Anode
2. Cathode
3. Emitter
4. Collector

### ● Features

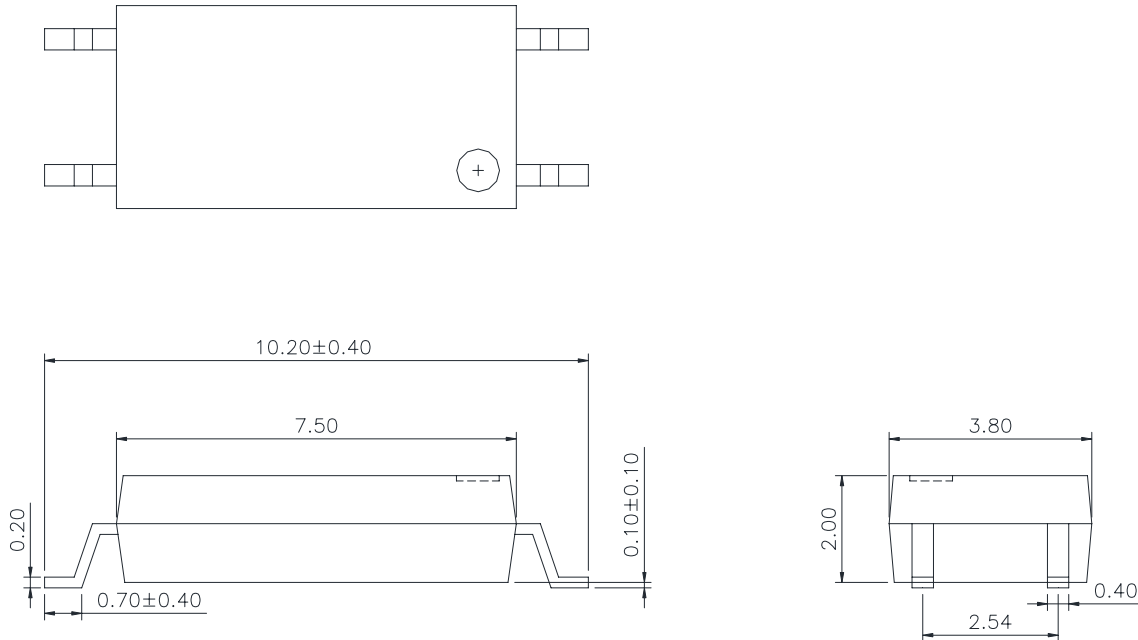
1. Halogen free
2. Pb free and RoHS compliant
3. Temperature range -55°C to 115°C
4. High isolation voltage 5000Vrms
5. Opaque type, SMD low profile 4 lead package
6. Current transfer ratio  
(CTR : Min.50% at  $I_F=5\text{mA}$   $V_{CE}=5\text{V}$ )
7. 8mm outer creepage distance
8. DC input with transistor output
9. MSL class 1
10. Agency Approvals:
  - UL Approved (No. E169586): UL1577
  - c-UL Approved (No. E169586)
  - VDE Approved (No. 40031267): DIN EN60747-5-5
  - FIMKO Approved: EN60065, EN60950, EN60335, EN60601
  - CQC Approved: GB8898-2011, GB4943.1-2011

### ● Applications

- Hybrid substrates that require high density mounting
- Programmable controllers
- Switch mode power supplies
- Microprocessor system interface

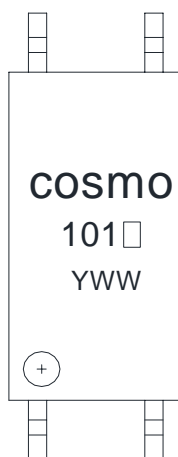
● **Outside Dimension**

Unit : mm



TOLERANCE :  $\pm 0.2$ mm

● **Device Marking**



**Notes:**

cosmo

101 □

YWW

□ : CTR rank

Y: Year code / WW: Week code

● **Absolute Maximum Ratings**

(Ta=25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current	$I_F$	50	mA
	Peak forward current	$I_{FP}$	1	A
	Reverse voltage	$V_R$	6	V
	Power dissipation	$P_D$	100	mW
Output	Collector-Emitter voltage	$V_{CEO}$	80	V
	Emitter-Collector voltage	$V_{ECO}$	7	V
	Collector current	$I_C$	50	mA
	Collector power dissipation	$P_C$	150	mW
Total power dissipation		$P_{tot}$	250	mW
Isolation voltage 1 minute		$V_{iso}$	5000	Vrms
Operating temperature		$T_{opr}$	-55 to +115	°C
Storage temperature		$T_{stg}$	-55 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	$V_F$	$I_F=20mA$	-	1.2	1.4	V
	Reverse current	$I_R$	$V_R=4V$	-	-	10	uA
	Terminal capacitance	$C_t$	$V=0, f=1KHz$	-	30	250	pF
Output	Collector dark current	$I_{CEO}$	$V_{CE}=20V, I_F=0$	-	-	0.1	uA
	Collector-Emitter breakdown voltage	$BV_{CEO}$	$I_C=0.1mA, I_F=0$	80	-	-	V
	Emitter-Collector breakdown voltage	$BV_{ECO}$	$I_E=100uA, I_F=0$	7	-	-	V
Transfer characteristics	Current transfer ratio	CTR	$I_F=5mA, V_{CE}=5V$	50	-	600	%
			$I_F=1mA, V_{CE}=5V$	15	-	-	%
	Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_F=10mA, I_C=1mA$	-	0.1	0.3	V
	Isolation resistance	$R_{iso}$	DC500V, 40 to 60%RH	$5 \times 10^{10}$	$10^{11}$	-	$\Omega$
	Floating capacitance	$C_f$	$V=0, f=1MHz$	-	0.6	1.0	pF
	Response time (Rise)	$t_r$	$V_{CC}=2V, I_C=2mA, R_L=100\Omega$	-	5	-	us
	Response time (Fall)	$t_f$		-	4	-	us

Classification table of current transfer ratio is shown below.

CTR Rank	CTR (%)
KT1015	50 TO 150
KT1016	100 TO 300
KT1017	80 TO 160
KT1018	130 TO 260
KT1019	200 TO 400
KT1010	50 TO 600

Fig.1 Current Transfer Ratio vs. Forward Current

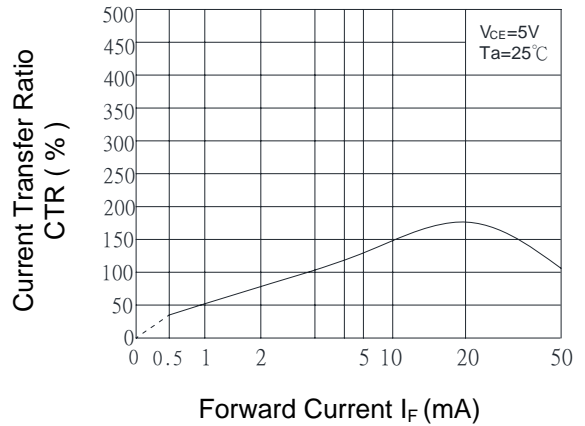


Fig.2 Collector Power Dissipation vs. Ambient Temperature

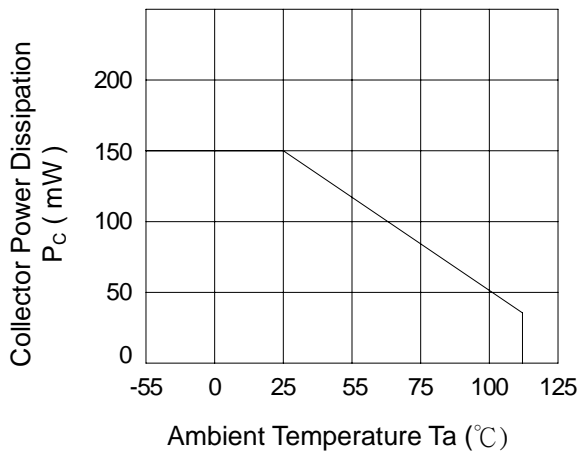


Fig.3 Collector Dark Current vs. Ambient Temperature

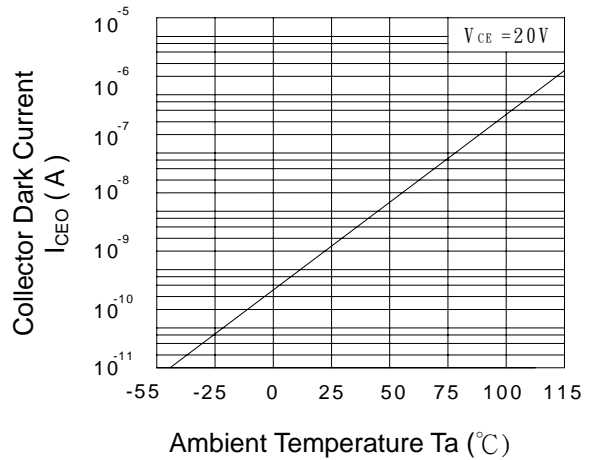


Fig.4 Forward Current vs. Ambient Temperature

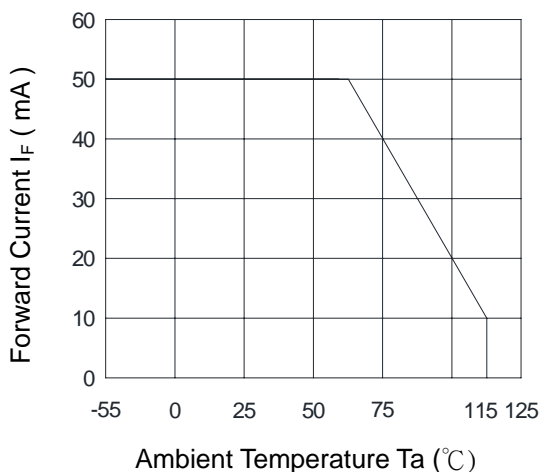
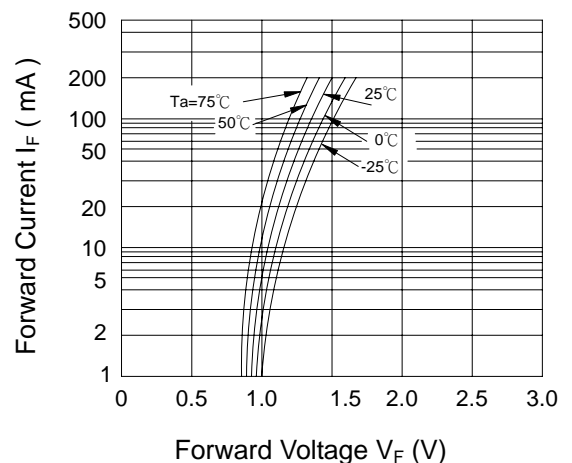
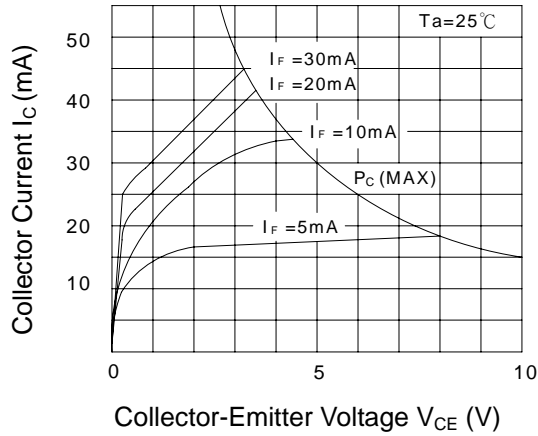


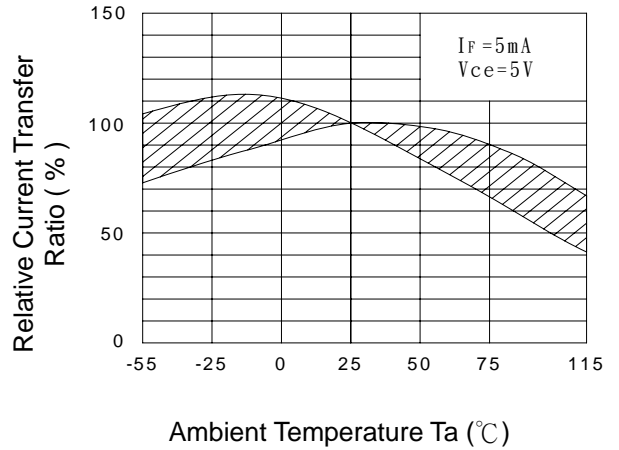
Fig.5 Forward Current vs. Forward Voltage



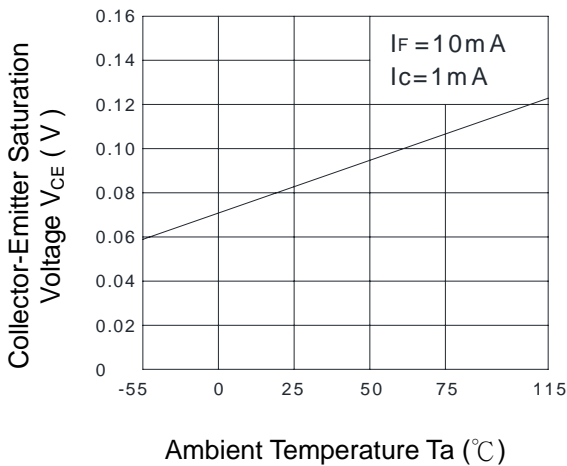
**Fig.6 Collector Current vs. Collector-Emitter Voltage**



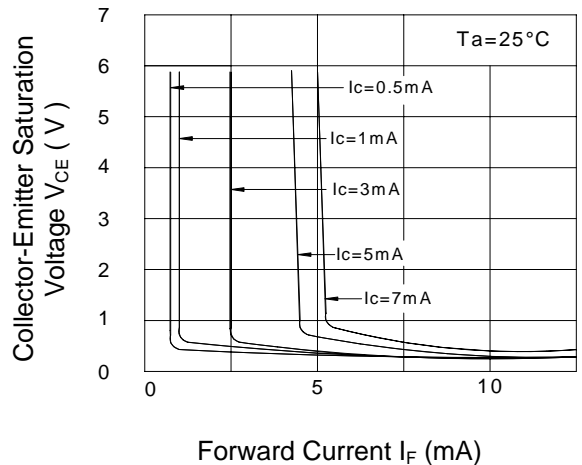
**Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature**



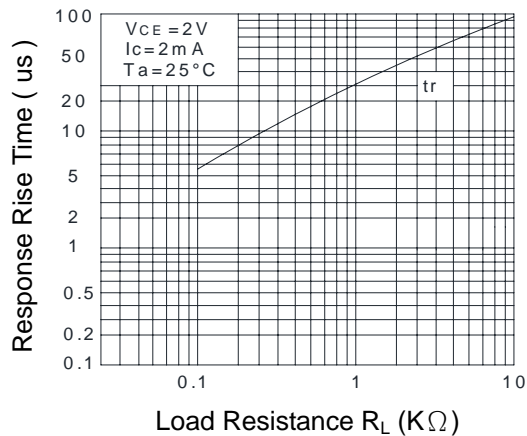
**Fig.8 Collector-Emitter Saturation Voltage vs. Ambient Temperature**



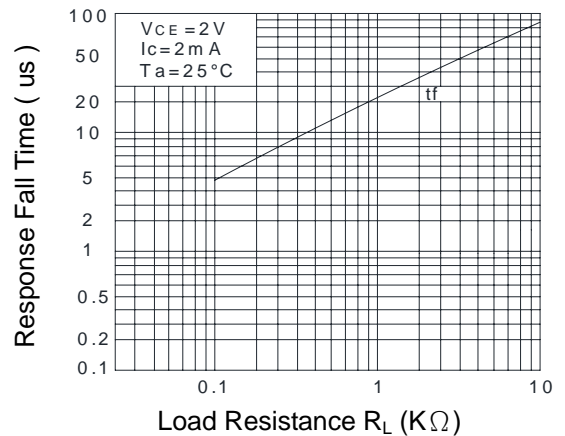
**Fig.9 Collector-Emitter Saturation Voltage vs. Forward Current**



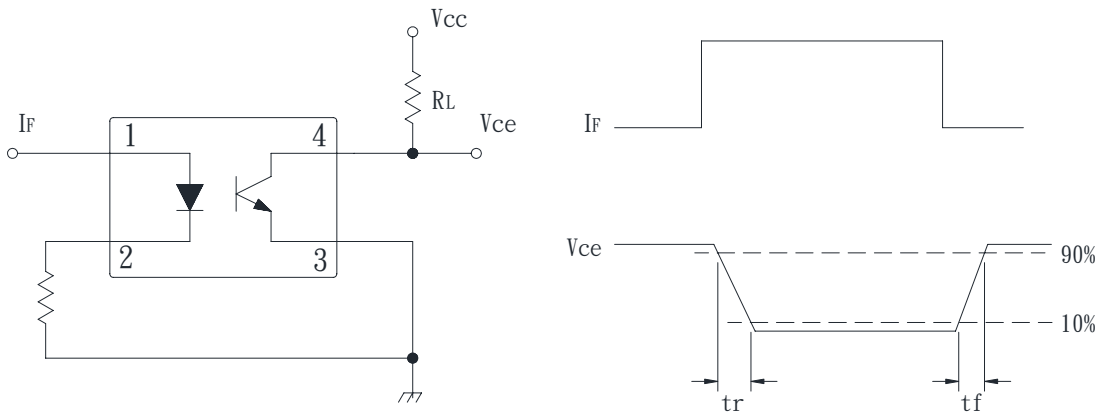
**Fig.10 Response Time (Rise) vs. Load Resistance**



**Fig.11 Response Time (Fall) vs. Load Resistance**



● **Test Circuit for Response Time**

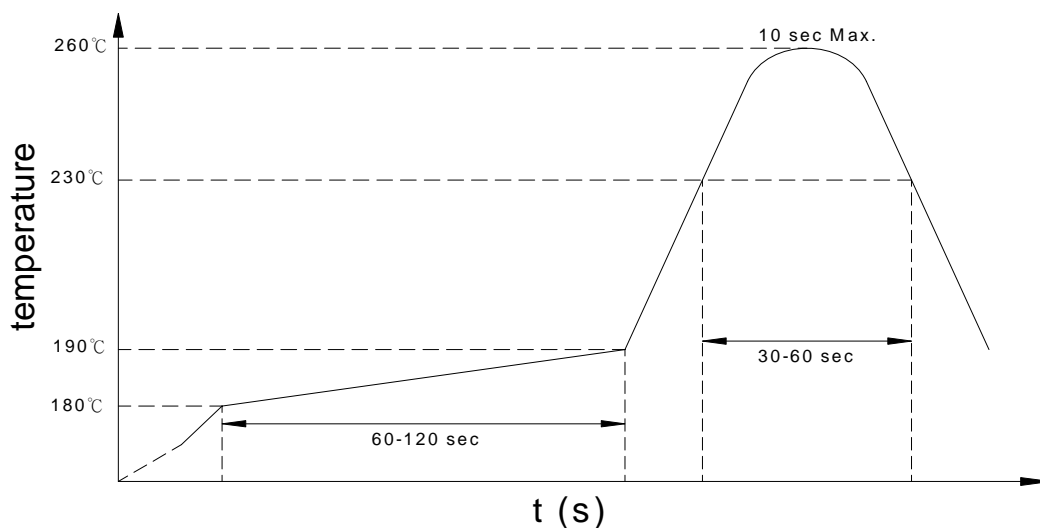


### ● Recommended Soldering Conditions

#### (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**

### KT101 Y (Z)

**Notes:**

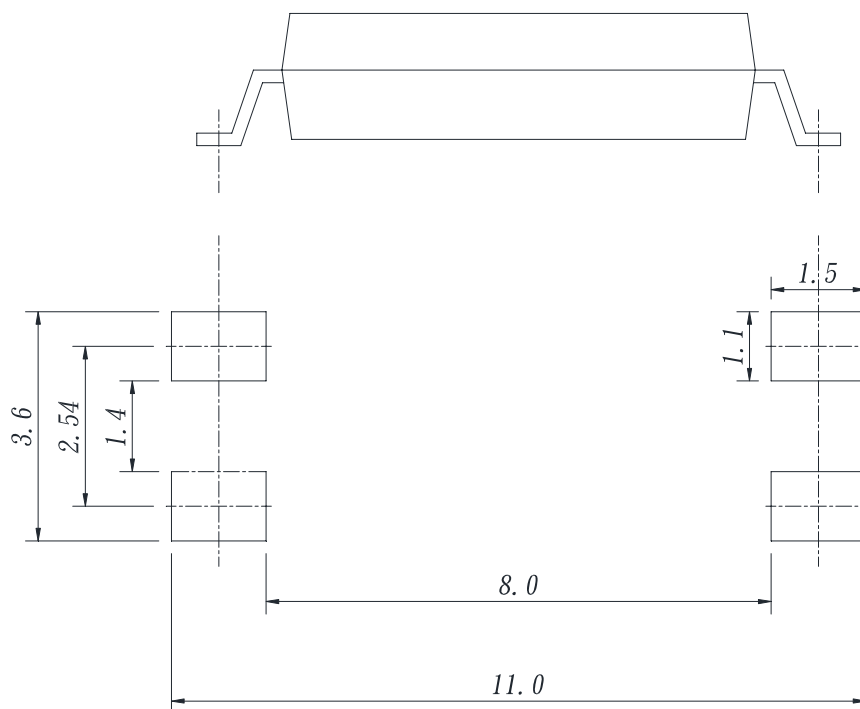
KT101 = Part No.

Y = CTR rank option (5 ~ 10)

Z = Tape and reel option (TLD · TRU)

Option	Description	Packing quantity
TLD	TLD tape & reel option	3000 units per reel
TRU	TRU tape & reel option	3000 units per reel

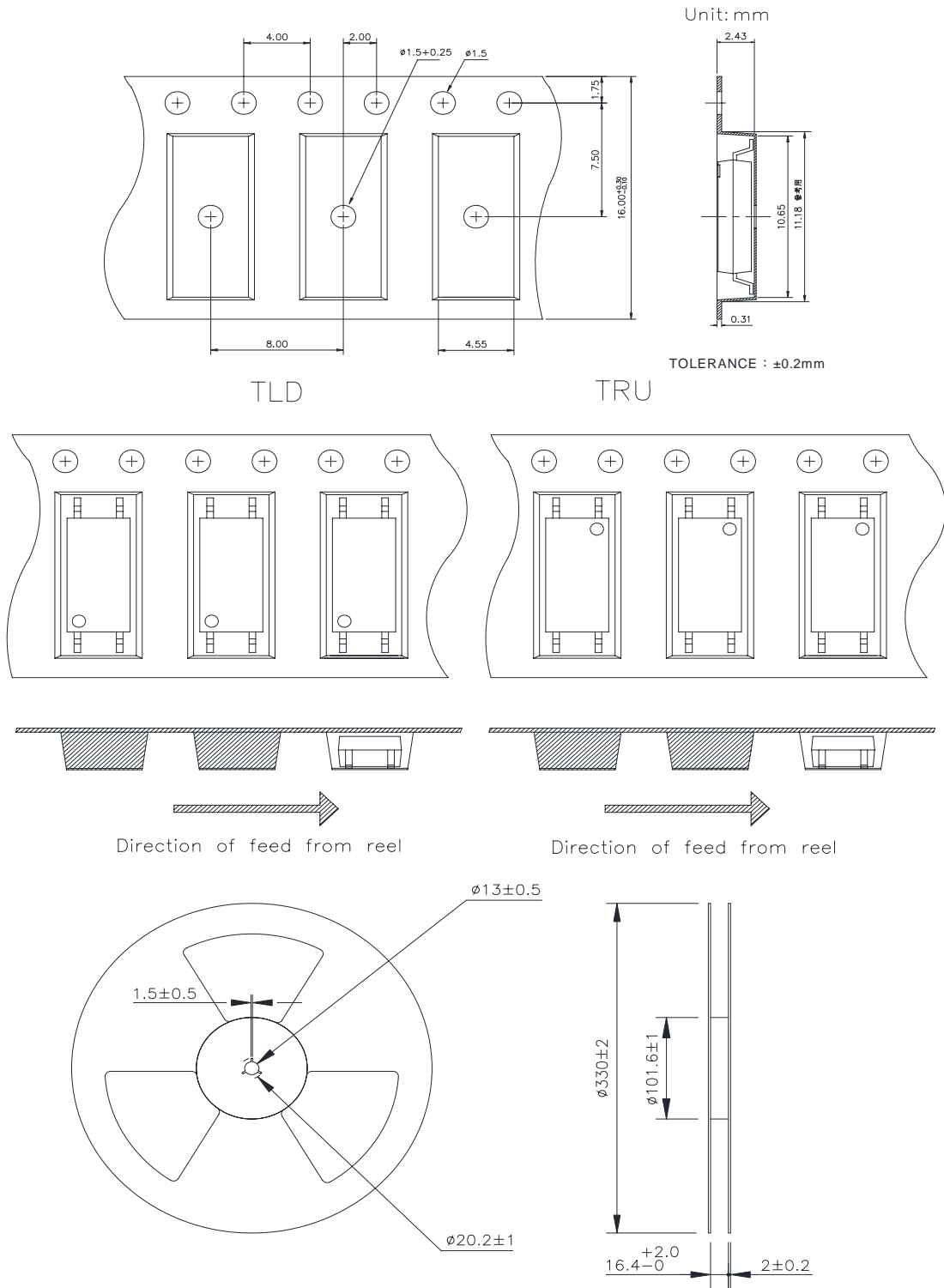
- **Recommended Pad Layout for Surface Mount Lead Form**



Unit : mm



● 4-pin LSOP Carrier Tape & Reel





# KT101X Series

## 4PIN LSOP PHOTOTRANSISTOR PHOTOCOUPLER

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### ● Application Notice

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- h. Telecommunication

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- d. Nuclear power control
- e. Equipment used for automotive vehicles, trains, ships...etc.

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