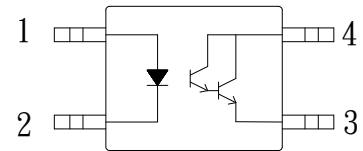


### ● Description

The KT1210 series consist of a photo darlington optically coupled to a gallium arsenide infrared-emitting diode 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

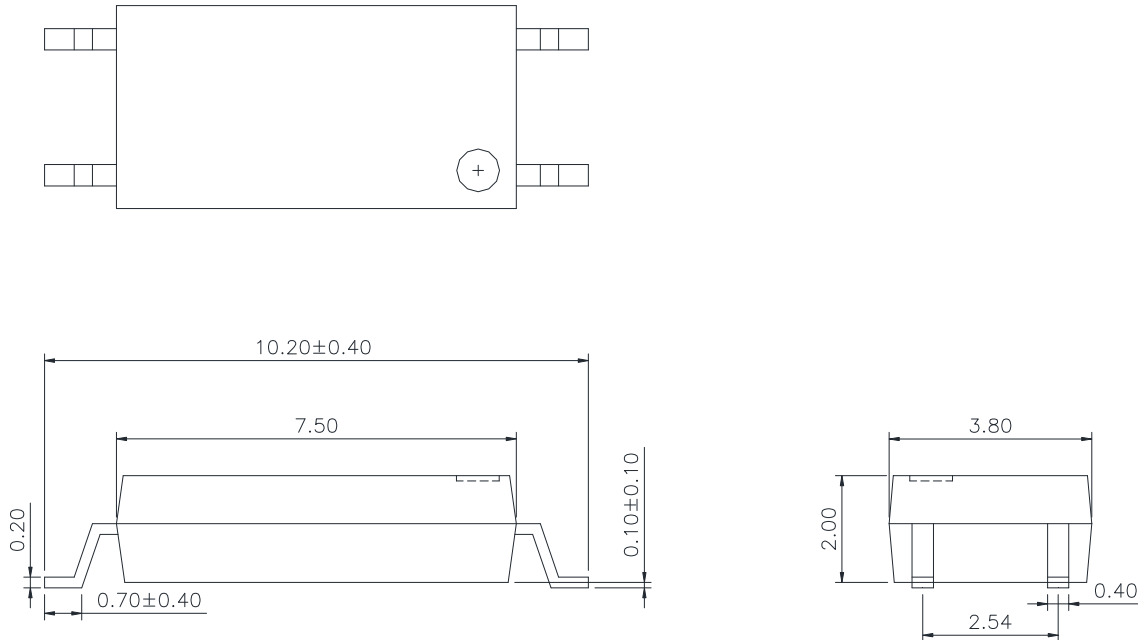
1. Pb free and RoHS compliant
2. Temperature range -55°C to 115°C
3. High isolation voltage 5000Vrms
4. Opaque type, SMD low profile 4 lead package
5. High current transfer ratio  
(CTR=2000%TYP.@  $I_F=1$  mA,  $V_{CE}=2$  V)
6. 8mm outer creepage distance
7. MSL class 1
8. Agency Approvals:
  - UL Approved (No. E169586): UL1577
  - c-UL Approved (No. E169586)
  - VDE Approved (No. 40031267): DIN EN60747-5-5
  - FIMKO Approved: EN62368-1, EN60601-1
  - CQC Approved: GB8898-2011, GB4943.1-2011

### ● Applications

- System appliances, measuring instruments.
- Industrial robots.
- Copiers, automatic vending machines.
- Signal transmission between circuits of different potentials and impedances.
- Telephone sets.
- Copiers, facsimiles.
- Interface with various power supply circuits, power distribution boards.
- Numerical control machines.

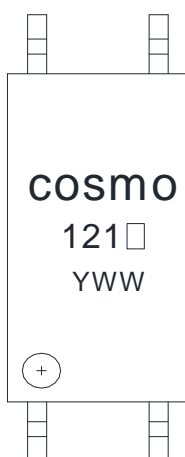
● **Outside Dimension**

Unit : mm



TOLERANCE :  $\pm 0.2$ mm

● **Device Marking**



**Notes:**

cosmo

121 □

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	$P_D$	70	mW
Output	Collector-Emitter voltage	$V_{CEO}$	35	V
	Emitter-Collector voltage	$V_{ECO}$	5	V
	Collector current	$I_C$	150	mA
	Collector power dissipation	$P_C$	150	mW
Total power dissipation		$P_{tot}$	170	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**

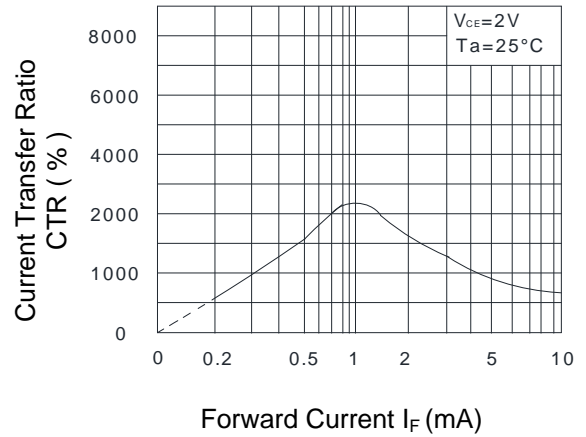
(Ta=25°C)

Parameter		Symbol	Conditions	Min.	Typ.	Max.	Unit
Input	Forward voltage	$V_F$	$I_F=20mA$	-	1.2	1.4	V
	Peak forward voltage	$V_{FP}$	$I_{FP}=0.5A$	-	-	3.5	V
	Reverse current	$I_R$	$V_R=4V$	-	-	10	uA
	Terminal capacitance	$C_t$	$V=0, f=1KHz$	-	30	-	pF
Output	Collector dark current	$I_{CEO}$	$V_{CE}=10V, I_F=0$	-	-	1.0	uA
Transfer characteristics	Current transfer ratio	CTR	$I_F=1mA, V_{CE}=2V$	200	2000	-	%
	Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_F=1mA, I_C=2mA$	-	-	1.0	V
	Isolation resistance	Riso	DC500V, 40 to 60%RH	$5 \times 10^{10}$	$10^{11}$	-	$\Omega$
	Floating capacitance	$C_f$	$V=0, f=1MHz$	-	0.4	-	pF
	Cut-off frequency	$f_c$	$V_{CC}=5V, I_C=2mA, R_L=100\Omega$	-	7	-	KHz
	Response time (Rise)	$t_r$	$V_{CC}=5V, I_C=2mA, R_L=100\Omega$	-	200	-	us
Response time (Fall)	$t_f$	-		200	-	us	

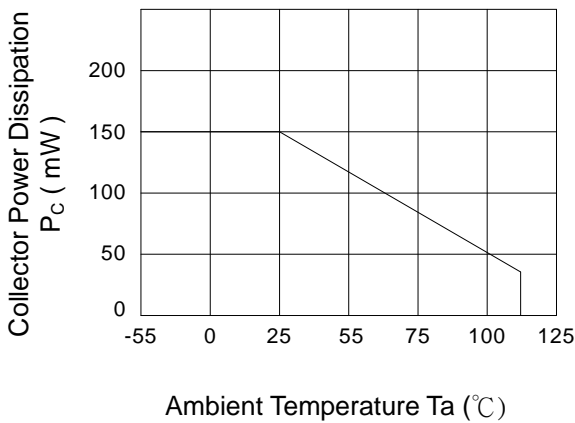
Classification table of current transfer ratio is shown below.

CTR RANK	CTR (%)
KT1210	Min.200

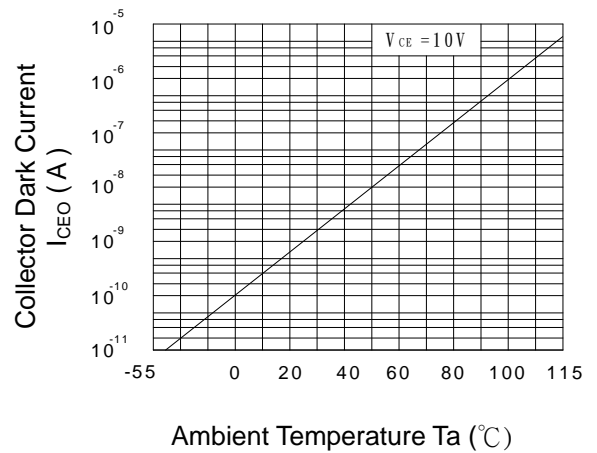
**Fig.1 Current Transfer Ratio vs. Forward Current**



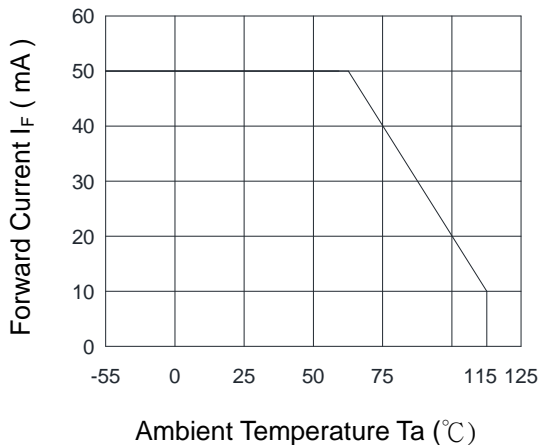
**Fig.2 Collector Power Dissipation vs. Ambient Temperature**



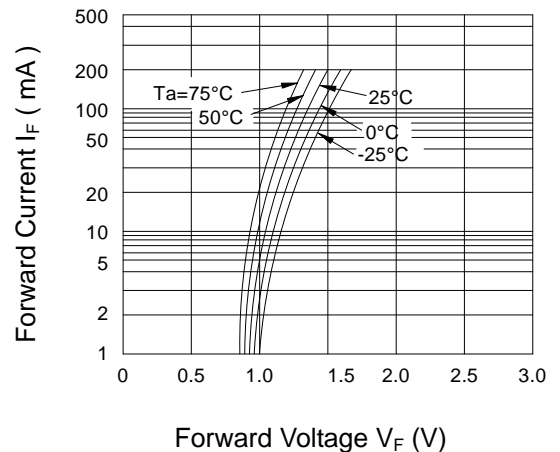
**Fig.3 Collector Dark Current vs. Ambient Temperature**



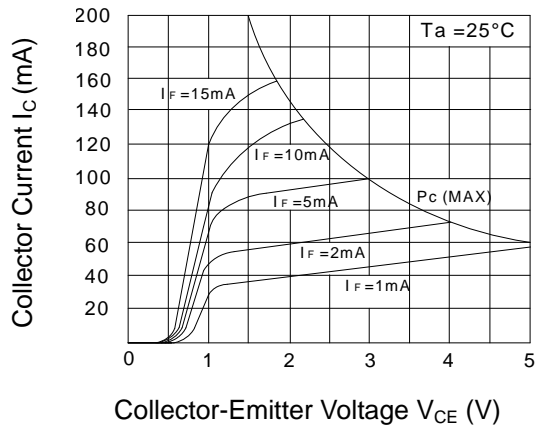
**Fig.4 Forward Current vs. Ambient Temperature**



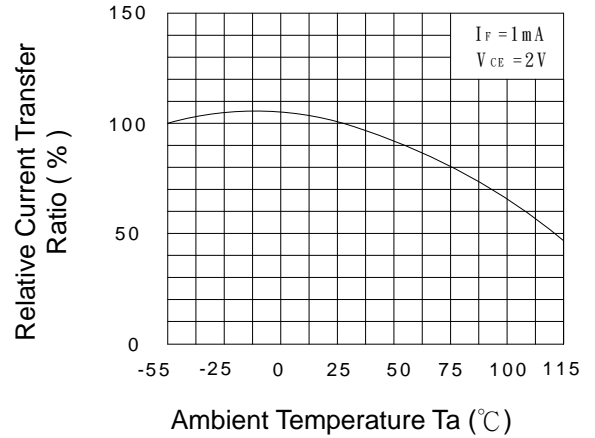
**Fig.5 Forward Current vs. Forward Voltage**



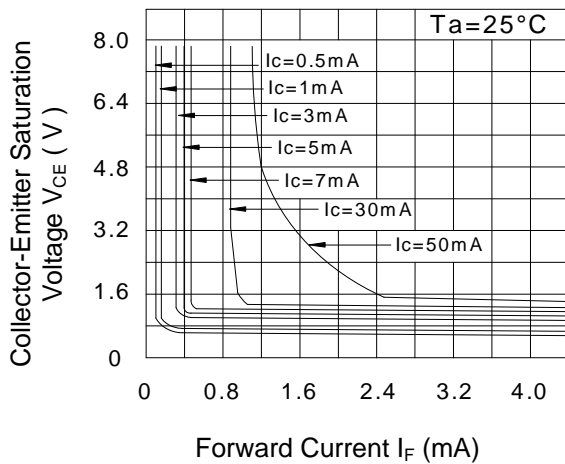
**Fig.6 Collector Current vs. Collector-Emitter Voltage**



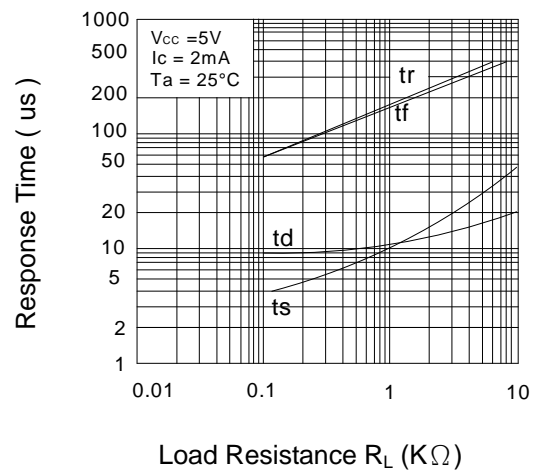
**Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature**



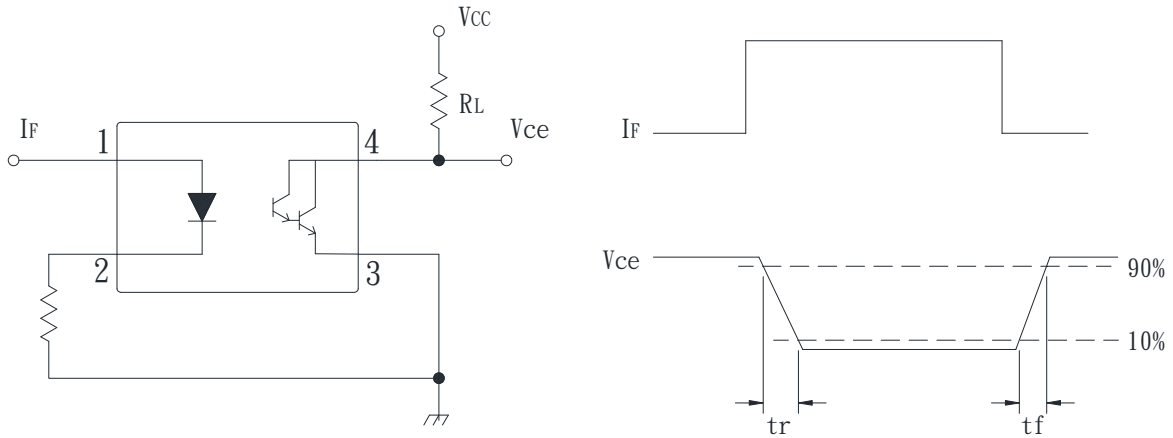
**Fig.8 Collector-Emitter Saturation Voltage vs. Forward Current**



**Fig.9 Response Time vs. Load Resistance**



● **Test Circuit for Response Time**

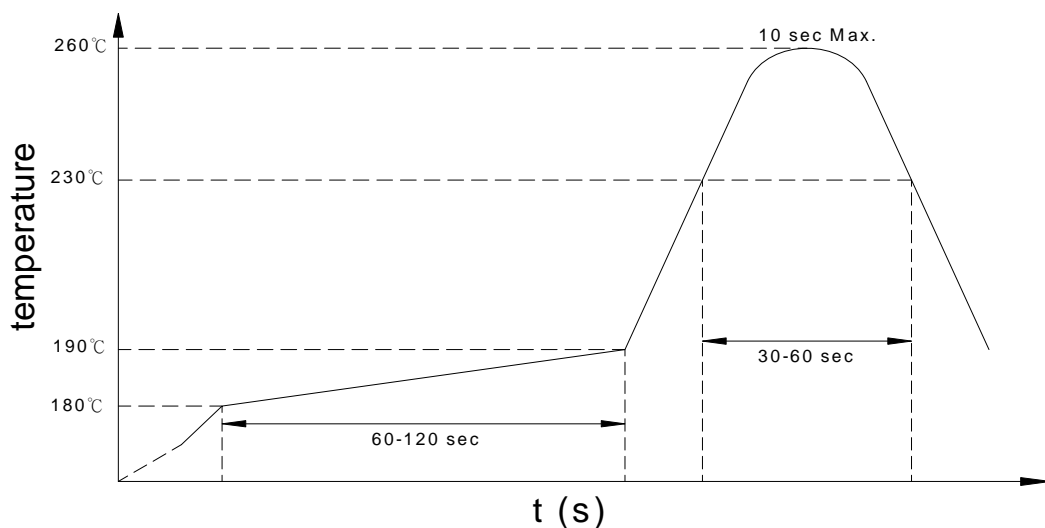


● **Recommended Soldering Conditions**

**(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**

## KT1210 (Z)

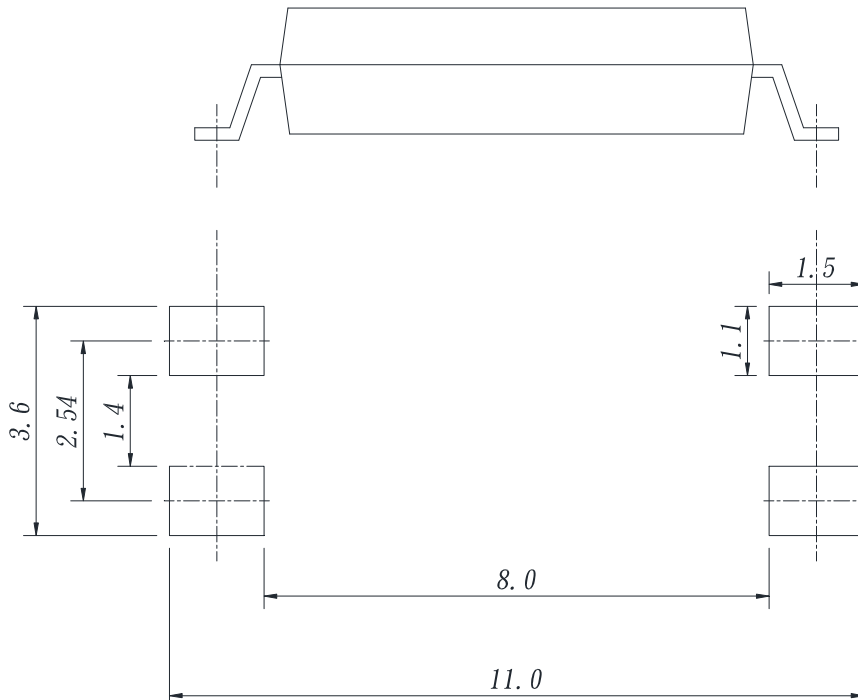
**Notes:**

KT1210 = Part No.

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

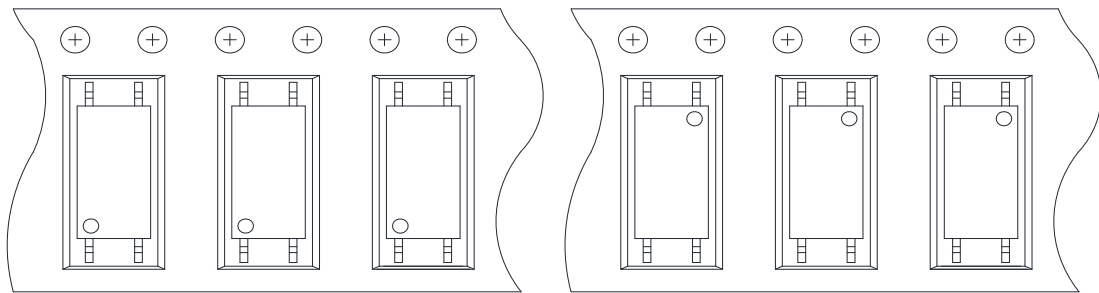
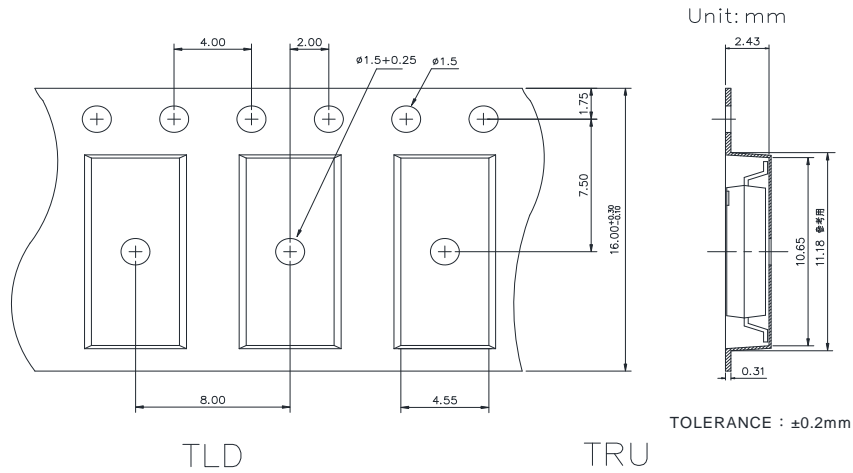
- **Recommended Pad Layout for Surface Mount Lead Form**



Unit : mm

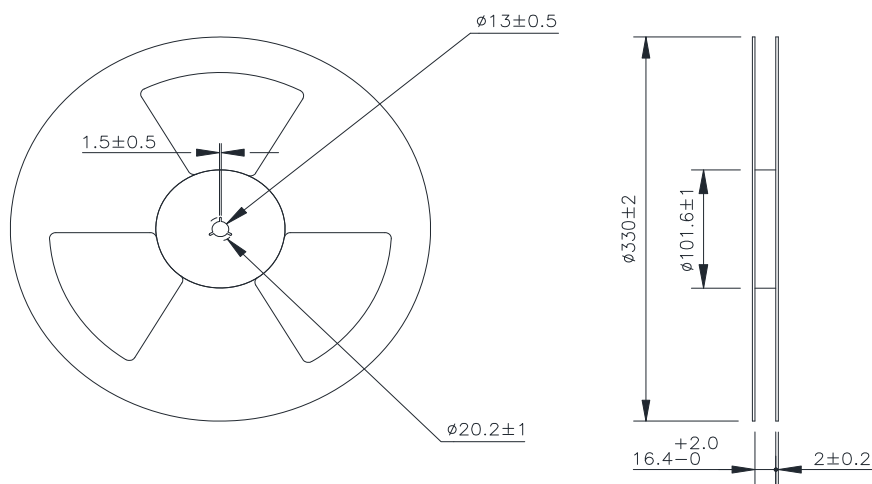


● 4-pin LSOP Carrier Tape & Reel



Direction of feed from reel

Direction of feed from reel



- **Application Notice**

The statements regarding the suitability of products for certain types of applications are based on cosmo's knowledge of general applications of cosmo products. Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to verify the specifications are suitable for use in a particular application. Customers are solely responsible for all aspects of their own product design or applications. The parameters provided in the datasheet may vary in different applications and performance may vary over time. All operating parameters (including typical parameters) must be validated by customer's technical experts for different applications. cosmo assumes no liability for customer' product design or applications. Product specifications do not expand or otherwise change cosmo's terms and conditions of purchase, including but not limited to the warranty expressed therein.

When using cosmo products, please comply with safety standards and instructions. cosmo has no liability and responsibility to the damage caused by improper use of the instructions specified in the specifications.

cosmo products are designed for use in general electronic equipment such as telecommunications, office automation equipments, personal computers, test and measurement equipments, consumer electronics, industrial control, instrumentation, audio, video.

cosmo devices shall not be used in equipment that requires higher level of reliability and safety, such as nuclear power control equipment, telecommunication equipment(trunk lines), space application, medical and other life supporting equipments, and equipment for aircraft, military, automotive or any other application that can cause human injury or death.

cosmo reserves the right to change the specifications, data, characteristics, structure, materials and other contents at any time without notice. Please contact cosmo to obtain the latest specification.

cosmo disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.