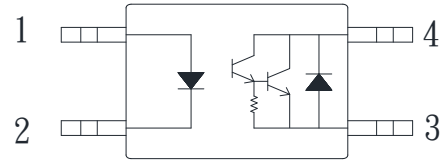


### ● Description

The KT1400 series consist of a photodarlington optically coupled to a gallium arsenide infrared-emitting diode in a 4 pin LSOP wide body package. Collector-emitter voltage is 300V. It features a high current transfer ratio, low coupling capacitance and high isolation voltage.

### ● Schematic



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

### ● Features

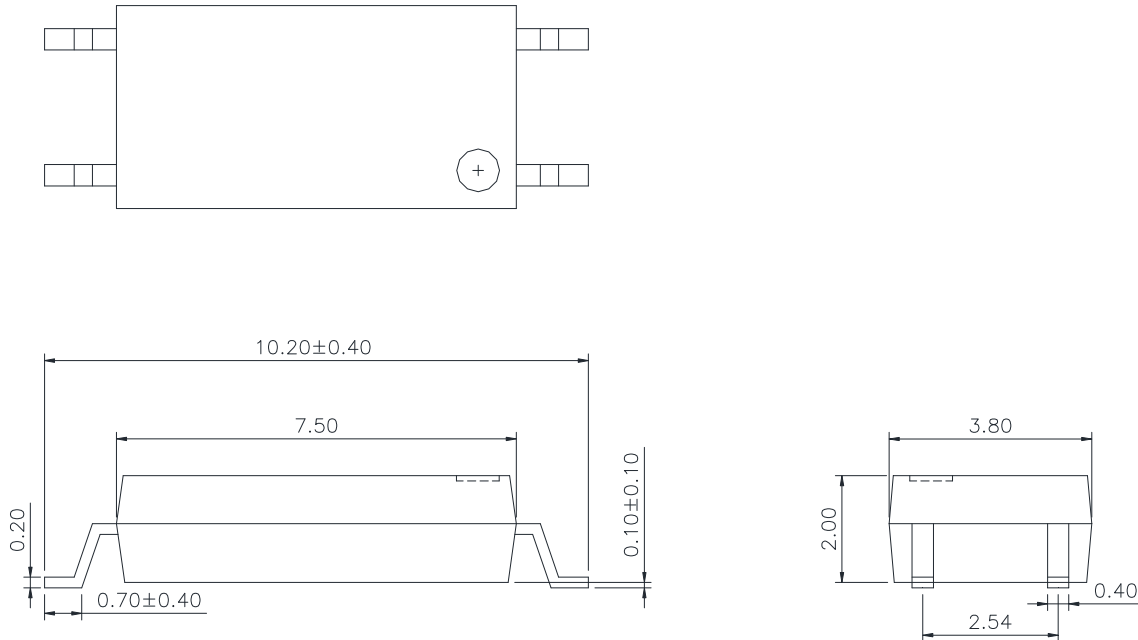
1. Pb free and RoHS compliant
2. Opaque type, SMD low profile 4 lead package
3. High collector-emitter voltage ( $V_{CE0} : 300V$ )
4. High current transfer ratio  
(CTR : Min.1000% at  $I_F = 1mA, V_{CE} = 2V$ )
5. High isolation voltage 5000Vrms
6. 8mm outer creepage distance
7. MSL class 1
8. Agency 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

- Telephone sets
- Copiers, facsimiles
- Interfaces with various power supply circuits, power distribution boards
- Hybrid substrates which require high density mounting

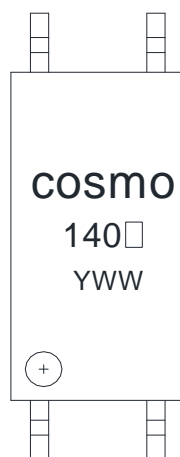
● **Outside Dimension**

Unit : mm



TOLERANCE :  $\pm 0.2\text{mm}$

● **Device Marking**



**Notes:**

cosmo

140□

YWW

□: CTR rank

Y: Year code / WW: Week code



# KT1400 Series

## 4PIN LSOP PHOTODARLINGTON PHOTOCOUPLER

### ● Absolute Maximum Ratings

(Ta=25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current	I <sub>F</sub>	50	mA
	Peak forward current	I <sub>FP</sub>	1	A
	Reverse voltage	V <sub>R</sub>	6	V
	Power dissipation	PD	70	mW
Output	Collector-Emitter voltage	V <sub>CEO</sub>	300	V
	Emitter-Collector voltage	V <sub>ECO</sub>	0.1	V
	Collector current	I <sub>C</sub>	150	mA
	Collector power dissipation	P <sub>C</sub>	150	mW
Total power dissipation		P <sub>tot</sub>	170	mW
Isolation voltage 1 minute		V <sub>iso</sub>	5000	V <sub>rms</sub>
Operating temperature		T <sub>opr</sub>	-55 to +100	°C
Storage temperature		T <sub>stg</sub>	-55 to +125	°C
Soldering temperature 10 second		T <sub>sol</sub>	260	°C

### ● Electro-optical Characteristics

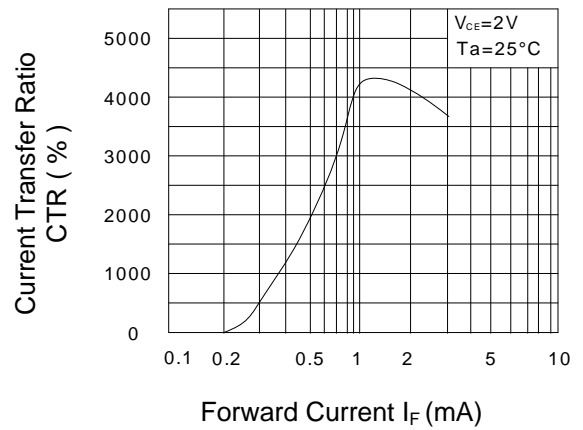
(Ta=25°C)

Parameter		Symbol	Conditions	Min.	Typ.	Max.	Unit
Input	Forward voltage	V <sub>F</sub>	I <sub>F</sub> =20mA	-	1.2	1.4	V
	Reverse current	I <sub>R</sub>	V <sub>R</sub> =4V	-	-	10	uA
	Terminal capacitance	C <sub>t</sub>	V=0, f=1KHz	-	30	-	pF
Output	Collector dark current	I <sub>CEO</sub>	V <sub>CE</sub> =200V, I <sub>F</sub> =0	-	-	1	uA
	Collector-Emitter breakdown voltage	BV <sub>CEO</sub>	I <sub>C</sub> =0.1mA, I <sub>F</sub> =0	300	-	-	V
Transfer characteristics	Current transfer ratio	CTR	I <sub>F</sub> =1mA, V <sub>CE</sub> =2V	1000	-	-	%
	Collector-Emitter saturation voltage	V <sub>CE(sat)</sub>	I <sub>F</sub> =1mA, I <sub>C</sub> =2mA	-	-	1.5	V
	Isolation resistance	R <sub>iso</sub>	DC500V, 40 to 60%RH	5x10 <sup>10</sup>	10 <sup>11</sup>	-	Ω
	Floating capacitance	C <sub>f</sub>	V=0, f=1MHz	-	0.6	1.0	pF
	Response time (Rise)	t <sub>r</sub>	V <sub>CC</sub> =2V, I <sub>C</sub> =20mA, R <sub>L</sub> =100Ω	-	100	300	us
Response time (Fall)	t <sub>f</sub>	-		20	100	us	

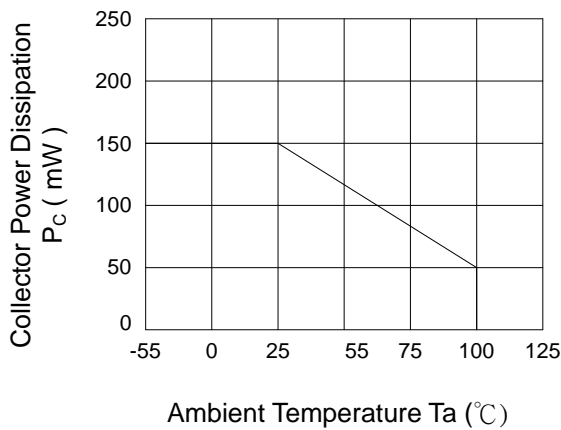
Classification table of current transfer ratio is shown below.

CTR Rank	CTR (%)
KT1400	Min.1000

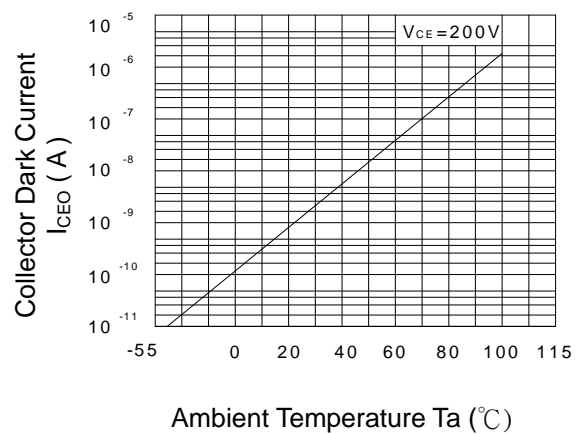
**Fig.1 Current Transfer Ratio vs. Forward Current**



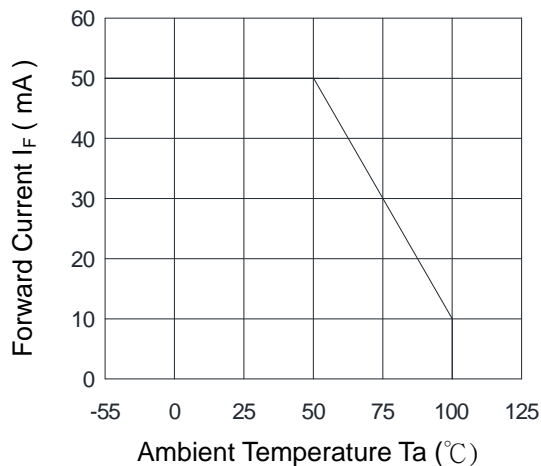
**Fig.2 Collector Power Dissipation vs. Ambient Temperature**



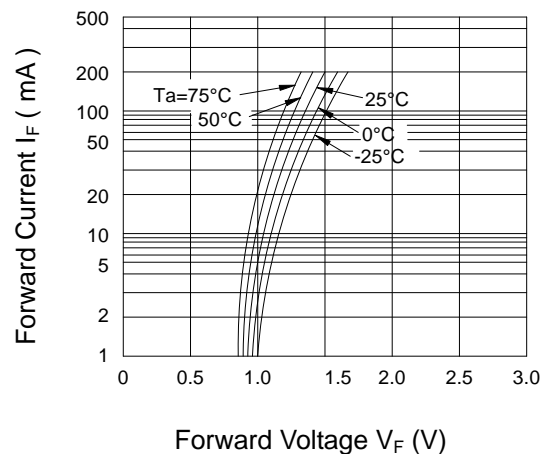
**Fig.3 Collector Dark Current vs. Ambient Temperature**



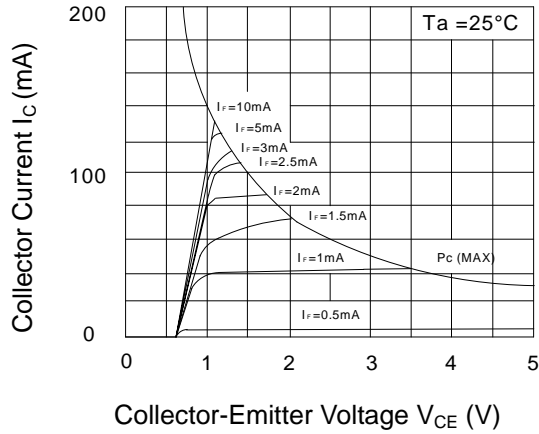
**Fig.4 Forward Current vs. Ambient Temperature**



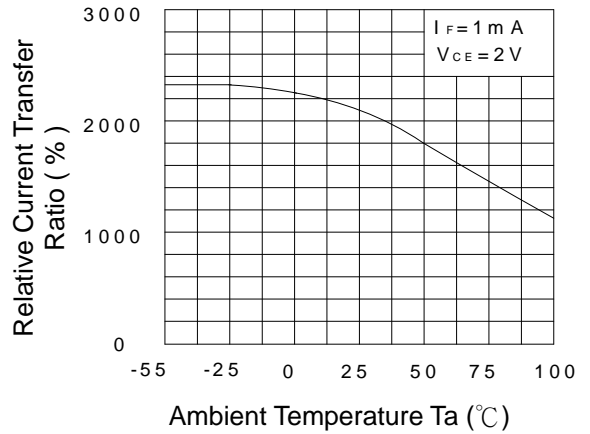
**Fig.5 Forward Current vs. Forward Voltage**



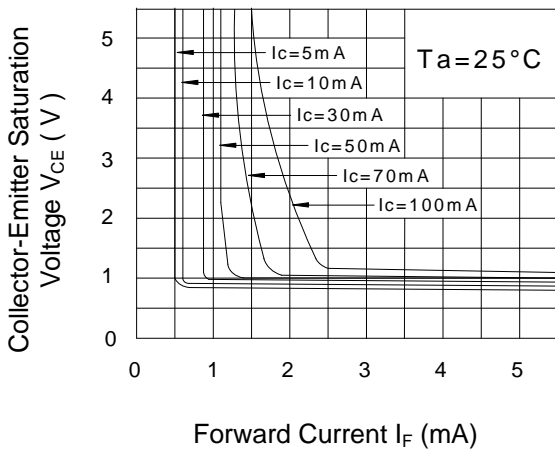
**Fig.6 Collector Current vs. Collector-Emitter Voltage**



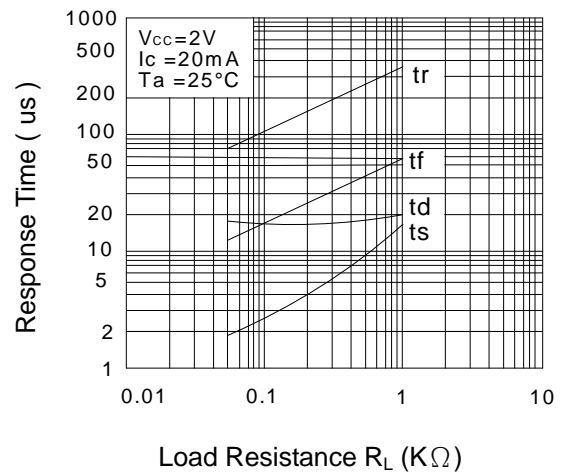
**Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature**



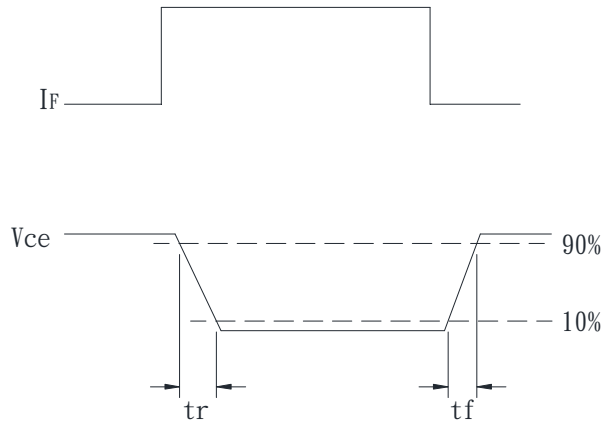
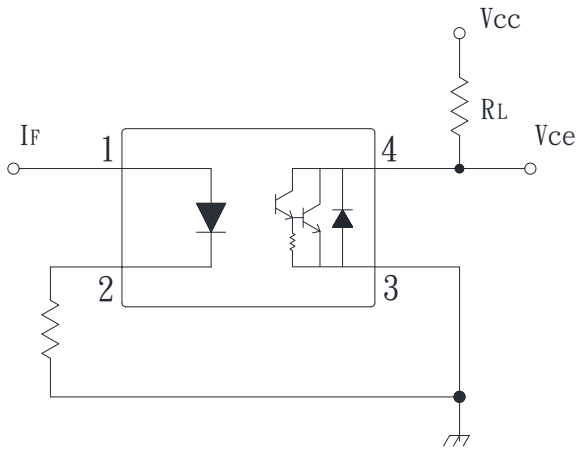
**Fig.8 Collector-Emitter Saturation Voltage vs. Forward Current**



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



● **Test Circuit for Response Time**

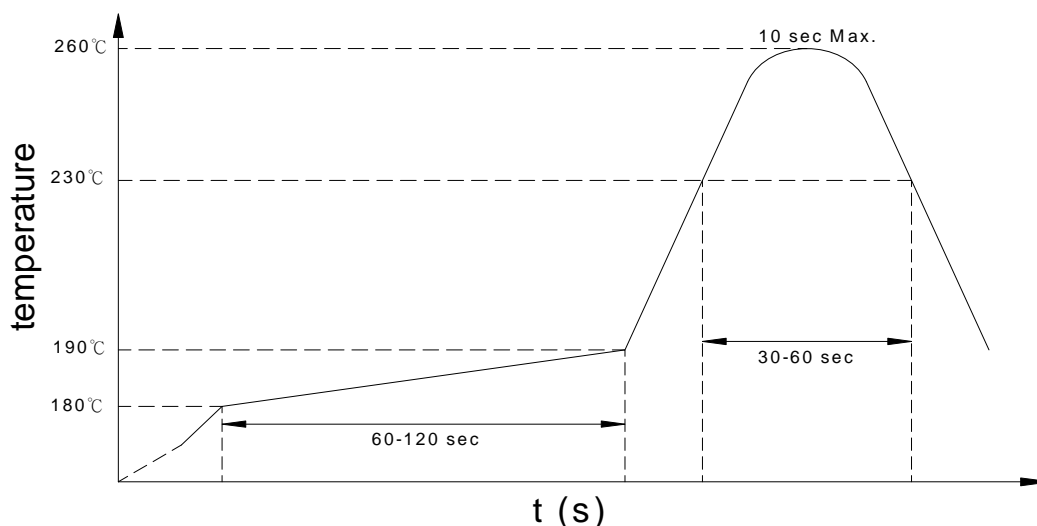


● **Recommended Soldering Conditions**

**(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**

## KT1400 (Z)

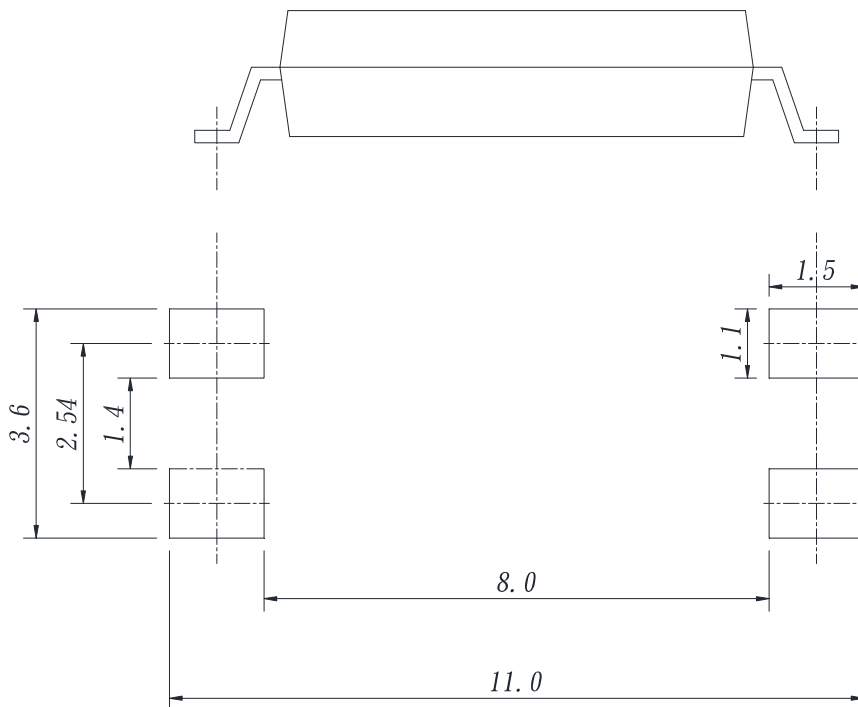
**Notes:**

KT1400= 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

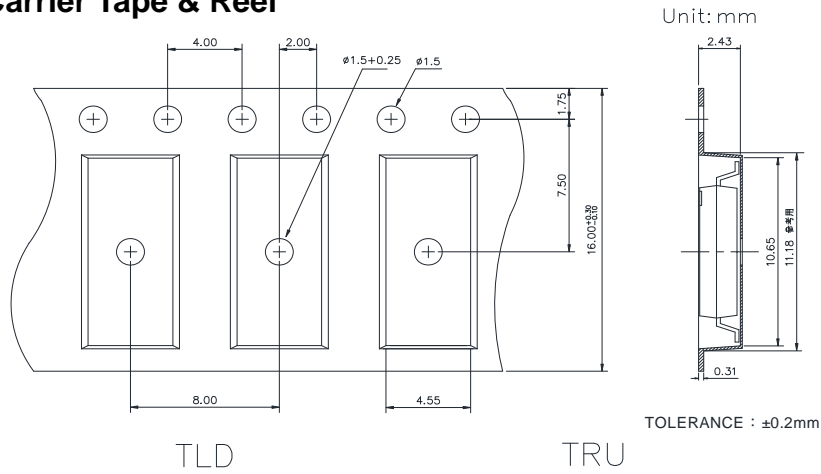
- **Recommended Pad Layout for Surface Mount Lead Form**



Unit : mm

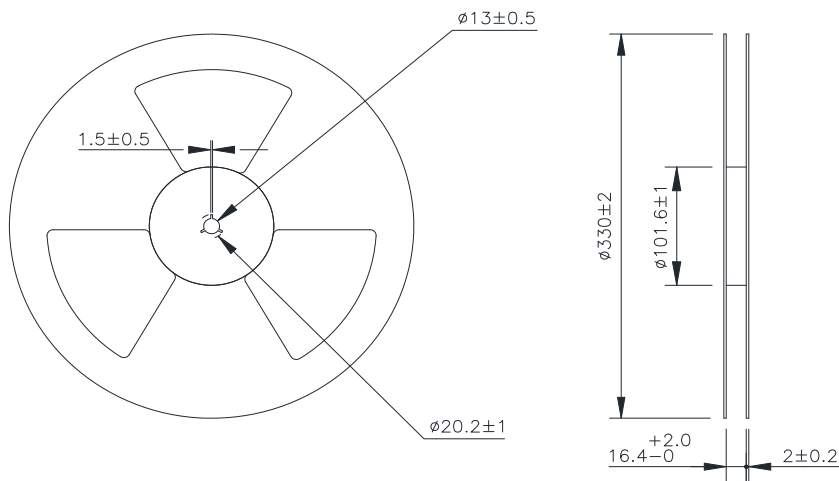
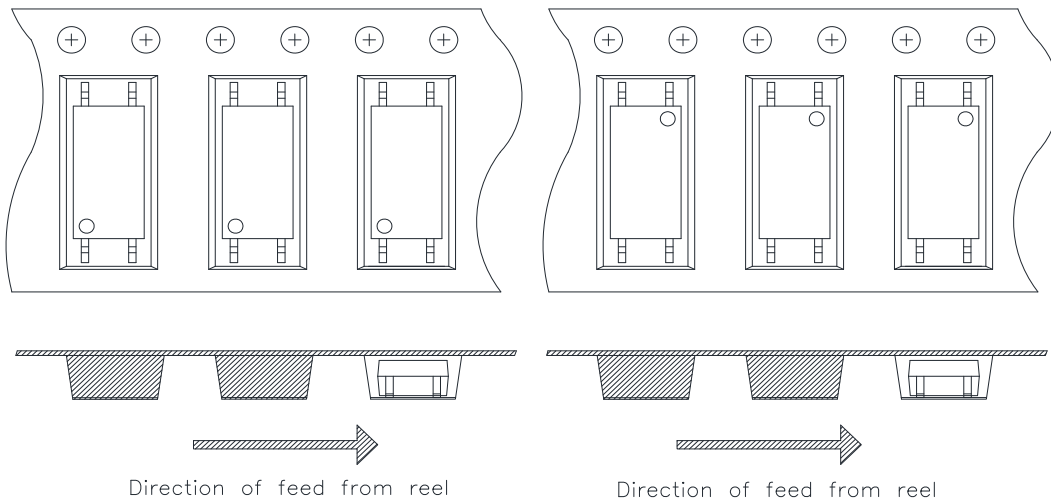


● 4-pin LSOP Carrier Tape & Reel



TLD

TRU



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