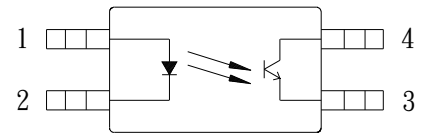


### ● Description

The KPS28010W is DC-input single channel which contains a light emitting diode optically coupled to a phototransistor. It is packaged in a 4-pin SSOP package. The input-output isolation voltage is rated at 3750 Vrms.

### ● Schematic



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

### ● Features

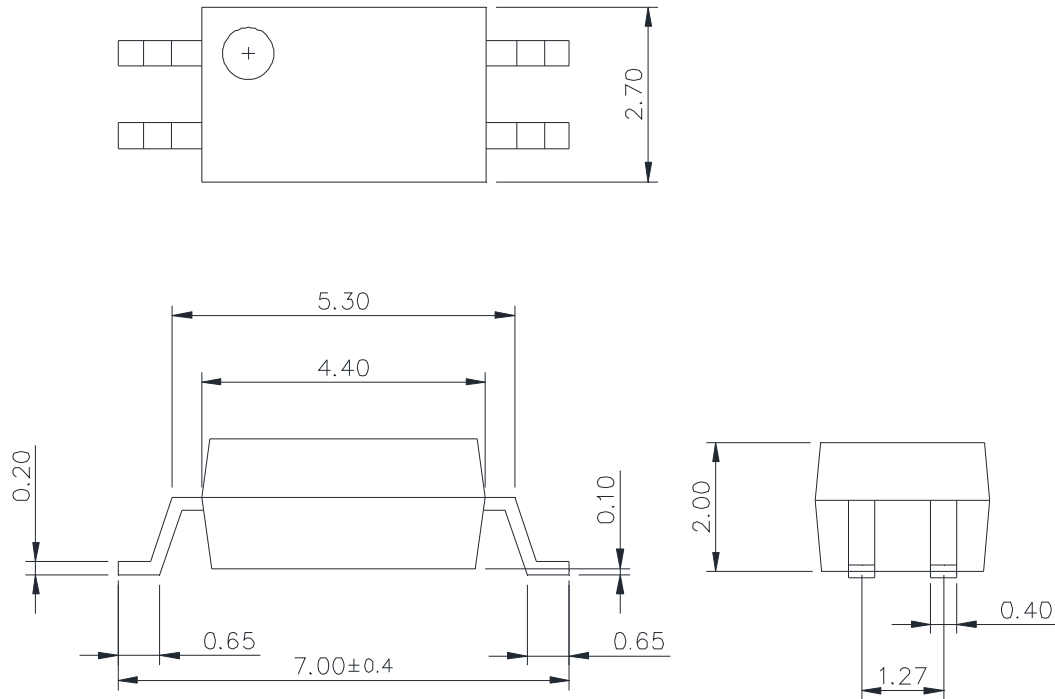
1. Halogen free
2. Pb free and RoHS compliant
3. High isolation voltage (Viso=3750Vrms)
4. Small and thin package (4pin SSOP, pin pitch 1.27mm)
5. Low input current type ( $I_F=0.5\text{mA}$ ).
6. Current transfer ratio  
(CTR : 100~600% at  $I_F=0.5\text{mA}$   $V_{CE}=5\text{V}$ ).
7. High collector to emitter voltage ( $V_{CEO}=80\text{V}$ ).
8. High-speed switching  $t_r=3\mu\text{s}$  (typ.),  $t_f=5\mu\text{s}$  (typ.).
9. MSL class 1
10. Agency Approvals:
  - UL Approved (No. E169586): UL1577
  - c-UL Approved (No. E169586)
  - VDE Approved (No. 40010469): DIN EN60747-5-5
  - FIMKO Approved: EN60065, EN60950
  - SEMKO Approved: EN60065, EN60950
  - CQC Approved: GB8898-2011, GB4943.1-2011

### ● Applications

- Programmable logic controllers
- Measuring instruments
- Power supply
- Hybrid IC

● **Outside Dimension**

Unit : mm



TOLERANCE : ±0.2mm

● **Device Marking**



**Notes:**

2801  
YWW Y: Year code / WW: Week code



# KPS28010W Series

## 4PIN SSOP LOW INPUT CURRENT PHOTOCOUPLER

### ● Absolute Maximum Ratings

(Ta=25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current	$I_F$	50	mA
	Peak forward current(*1)	$I_{FP}$	1	A
	Reverse voltage	$V_R$	6	V
	Power dissipation	$P_D$	60	mW
	Power dissipation derating	$P_D/^\circ C$	0.6	mW/°C
Output	Collector-Emitter voltage	$V_{CEO}$	80	V
	Emitter-Collector voltage	$V_{ECO}$	6	V
	Collector current	$I_C$	50	mA
	Collector power dissipation	$P_C$	160	mW
	Collector power dissipation derating	$P_C/^\circ C$	1.2	mW/°C
Isolation voltage 1 minute(*2)		Viso	3750	Vrms
Operating temperature		Topr	-55 to +115	°C
Storage temperature		Tstg	-55 to +125	°C

\*1 PW=100μs,Duty Cycle=1%.

\*2 AC voltage for 1minute at T =25°C ,RH=60% between input and output.

### ● Electro-optical Characteristics

(Ta=25°C)

Parameter		Symbol	Conditions	Min.	Typ.	Max.	Unit
Input	Forward voltage	$V_F$	$I_F=5mA$	-	1.1	1.8	V
	Reverse current	$I_R$	$V_R=5V$	-	-	5	μA
	Terminal capacitance	$C_t$	$V=0, f=1MHz$	-	60	-	pF
Output	Collector dark current	$I_{CEO}$	$V_{CE}=50V, I_F=0mA$	-	-	100	nA
Transfer characteristics	Current transfer ratio	CTR	$I_F=0.5mA, V_{CE}=5V$	100	-	600	%
	Collector-Emitter saturation voltage	$V_{CE(sat)}$	$I_F=10mA, I_C=2mA$	-	0.1	0.2	V
	Isolation resistance	Riso	DC500V	$5 \times 10^{10}$	$10^{11}$	-	Ω
	Floating capacitance	$C_f$	$V=0, f=1MHz$	-	0.4	-	pF
	Response time (Rise)(*3)	$t_r$	$V_{ce}=5V, I_C=2mA, R_L=100\Omega$	-	4	18	μs
	Response time (Fall) (*3)	$t_f$		-	3	18	μs

\*3 Test Circuit for Switching Time

Classification table of current transfer ratio is shown below.

CTR Rank.	CTR ( % )
KPS28010WA	100 TO 600
KPS28010WB	200 TO 500
KPS28010WC	160 TO 400
KPS28010WD	120 TO 300
KPS28010WE	100 TO 200

Fig.1 Current Transfer Ratio vs. Forward Current

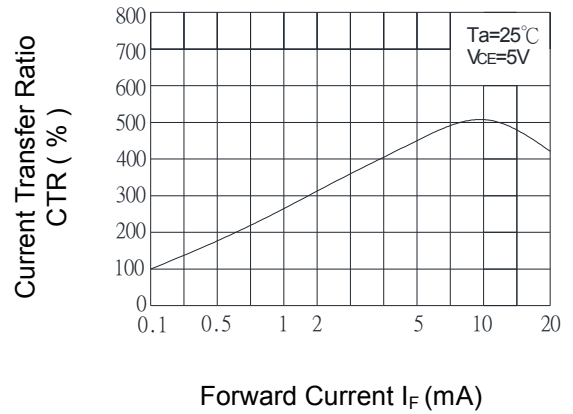


Fig.2 Collector Power Dissipation vs. Ambient Temperature

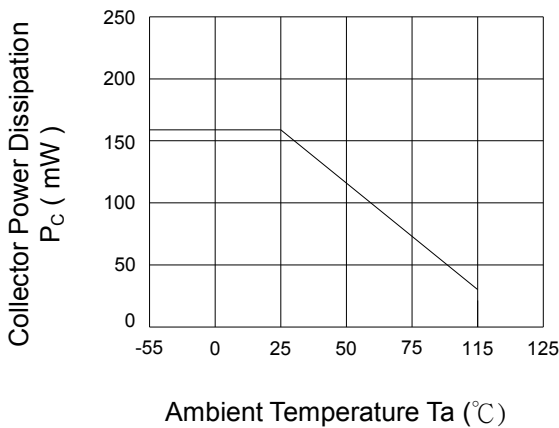


Fig.3 Collector Dark Current vs. Ambient Temperature

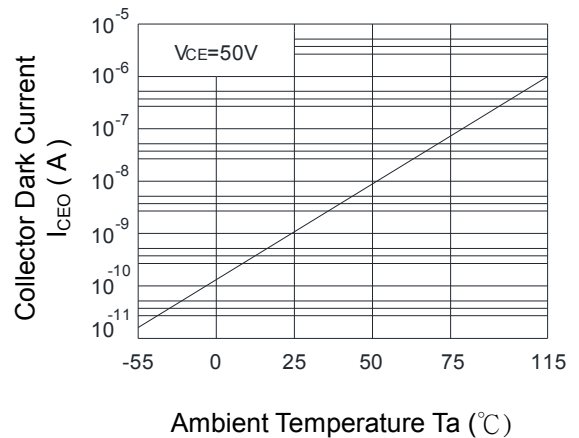


Fig.4 Forward Current vs. Ambient Temperature

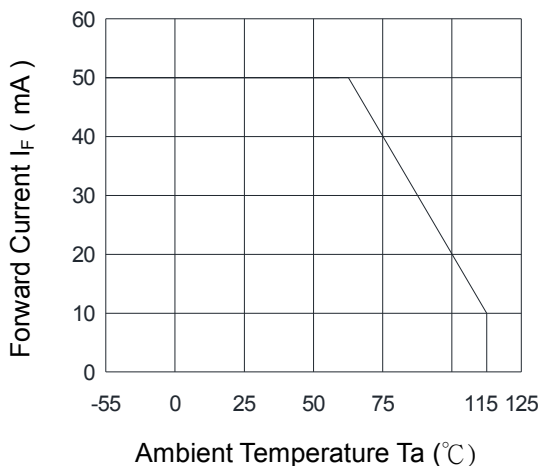
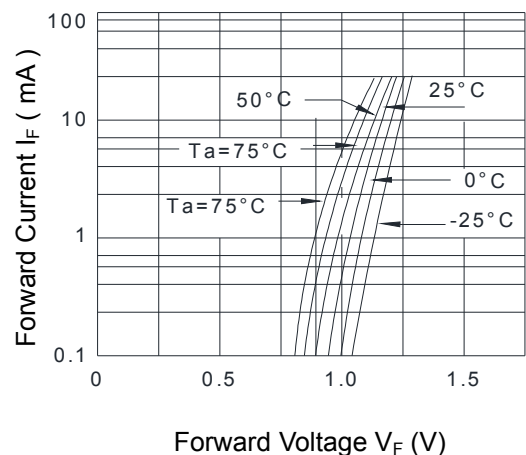
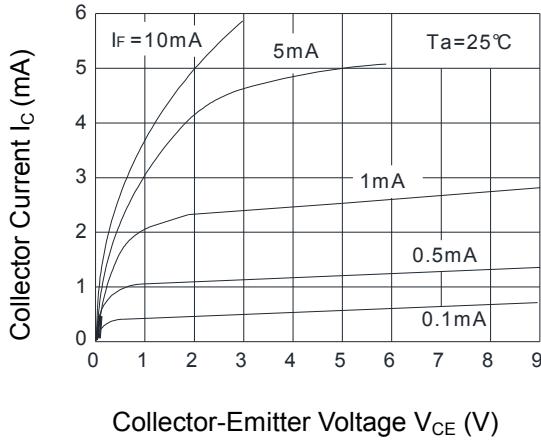


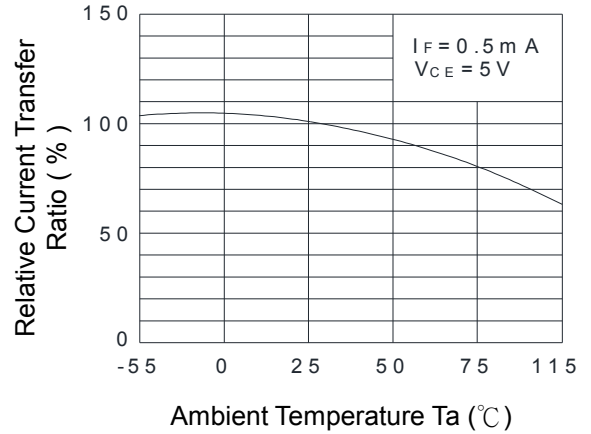
Fig.5 Forward Current vs. Forward Voltage



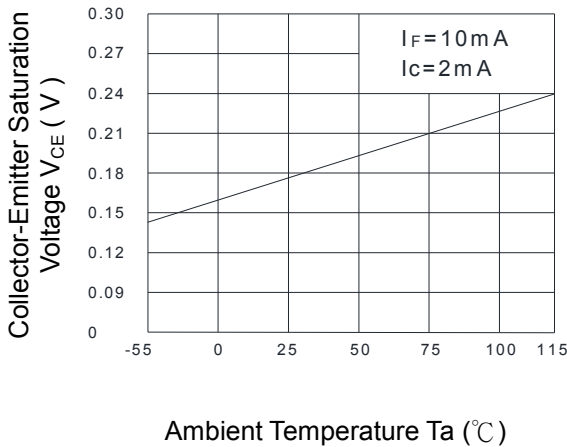
**Fig.6 Collector Current vs. Collector-Emitter Voltage**



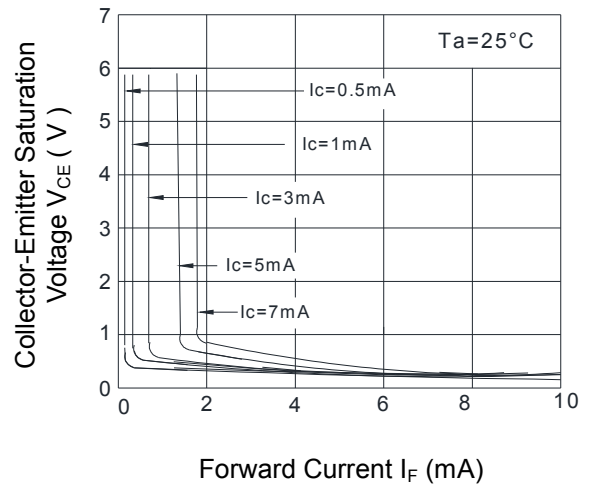
**Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature**



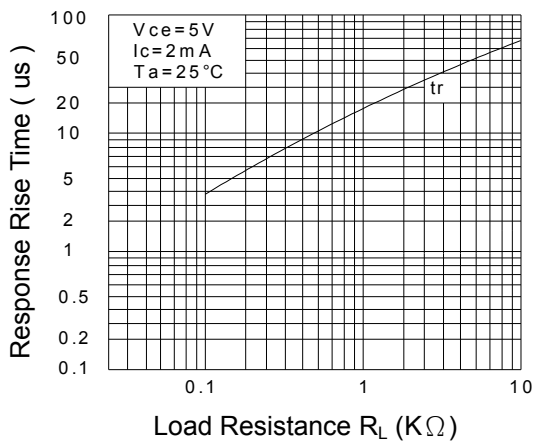
**Fig.8 Collector-Emitter Saturation Voltage vs. Ambient Temperature**



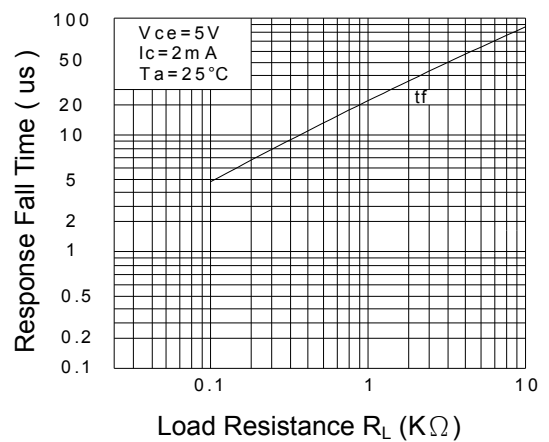
**Fig.9 Collector-Emitter Saturation Voltage vs. Forward Current**



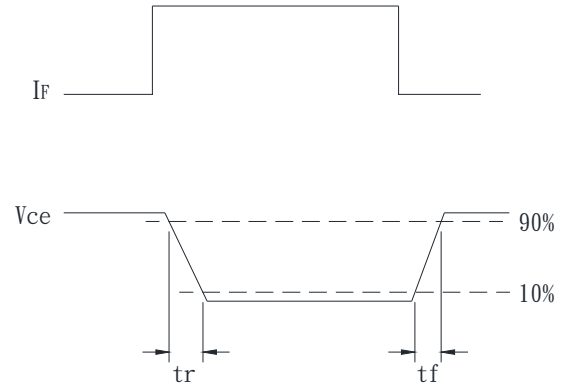
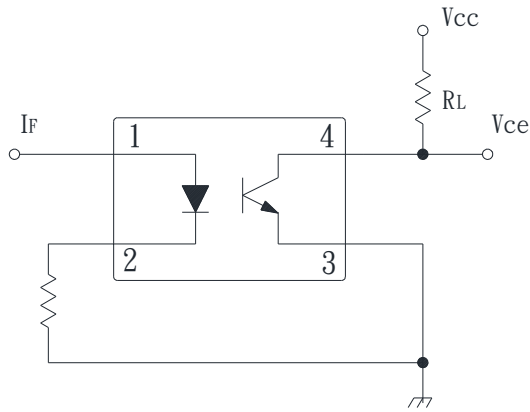
**Fig.10 Response Time (Rise) vs. Load Resistance**



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



● Test Circuit For Response Time

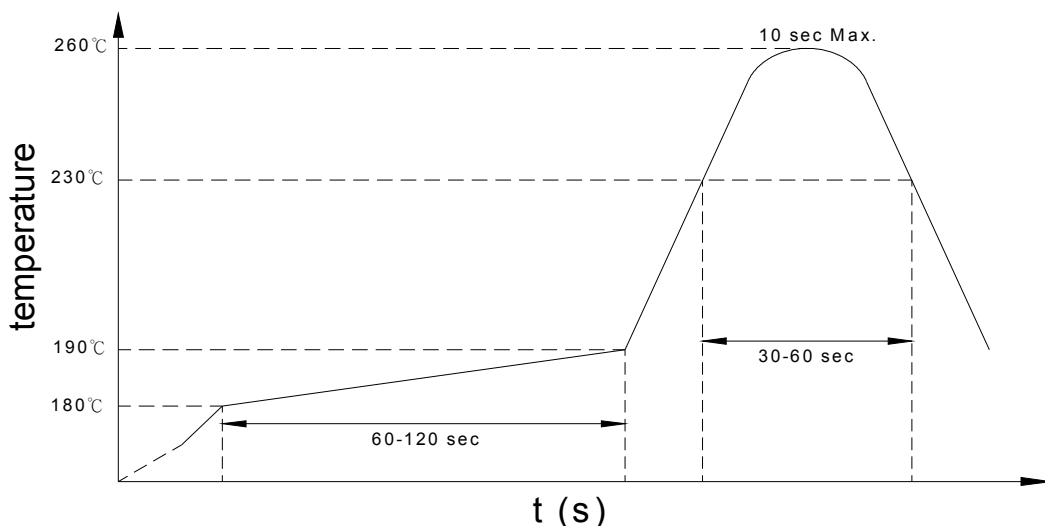


### ● Recommended Soldering Conditions

#### (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**

## KPS28010W Y (Z)

**Notes:**

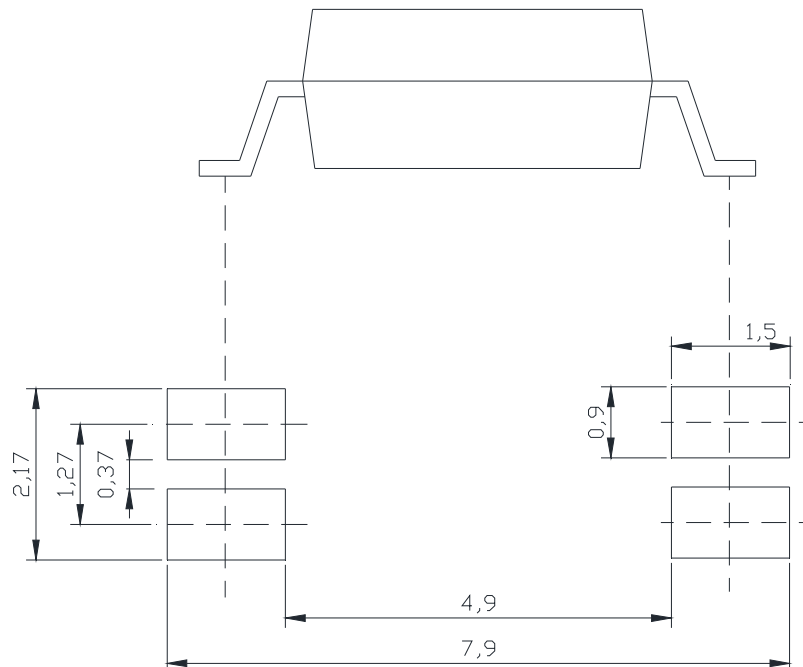
KPS28010W = Part No.

Y = CTR rank option (A ~ E)

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

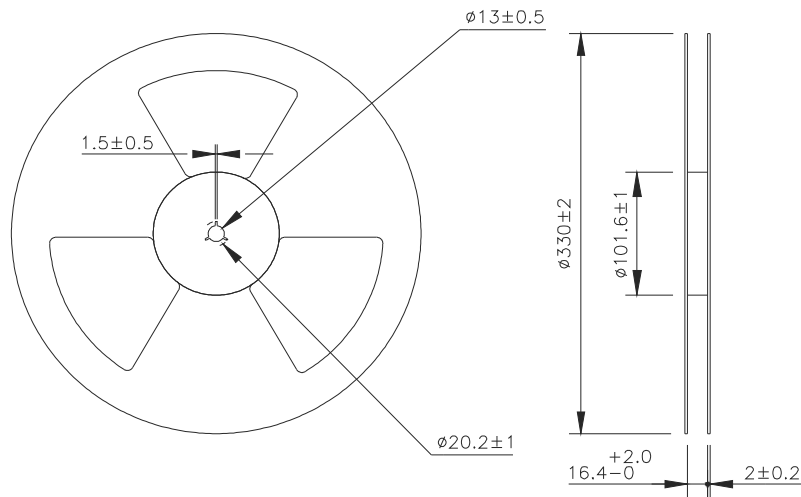
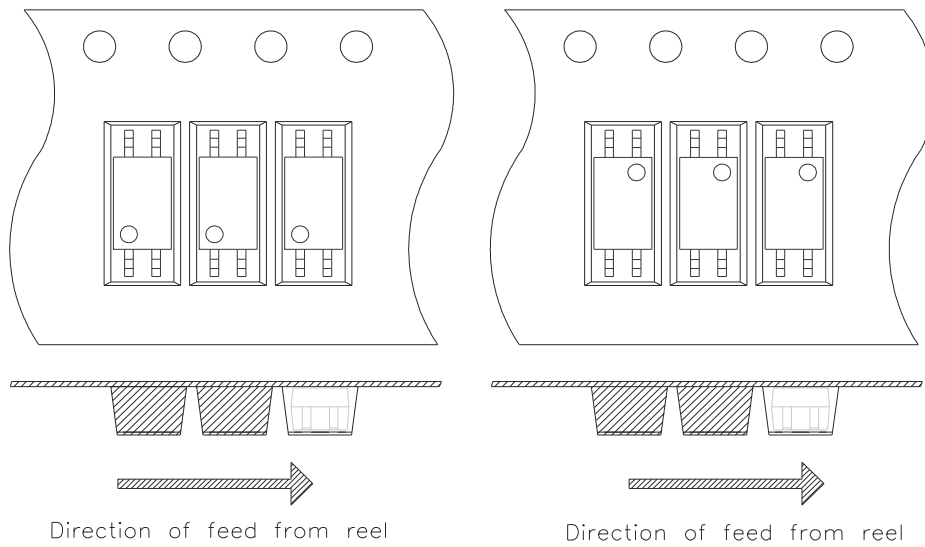
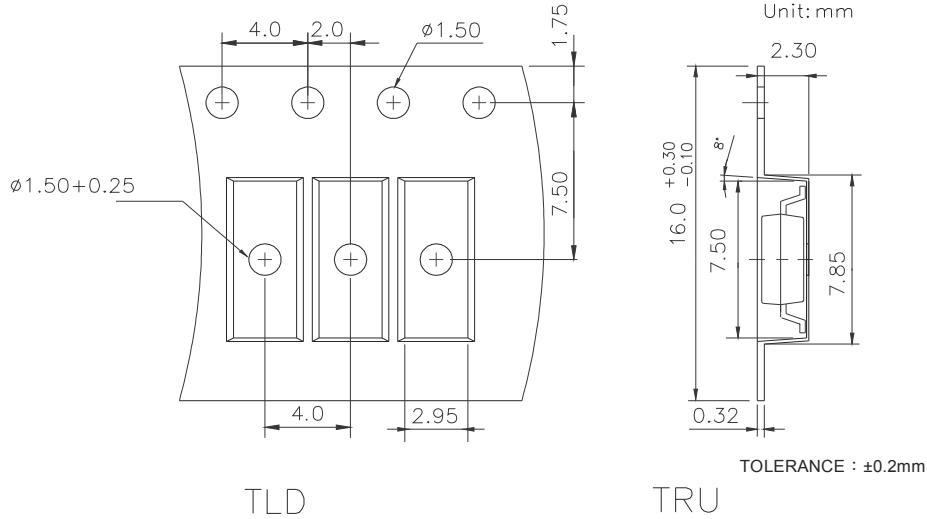
- **Recommended Pad Layout for Surface Mount Lead Form**



Unit : mm



● 4-pin SSOP Carrier Tape & Reel





# KPS28010W Series

## 4PIN SSOP LOW INPUT CURRENT PHOTOCOUPLER

---

### ● Application Notice

The content of datasheet is the guidance for product use only. cosmo takes no responsibility to the accuracy of the information provided here. For continuously improving all of products, including quality, reliability, function...etc., cosmo reserves the right to change the specification, characteristics, data, materials, and structure of products without notice. Please contact with cosmo to obtain the latest specification.

It would be required to comply with the absolute maximum ratings listed in the specification. cosmo has no liability and responsibility to the damage caused by improper use of the products.

cosmo products are intended to be designed for use in general electronics application list below:

- a. Personal computer
- b. OA machine
- c. Audio / Video
- d. Instrumentation
- e. Electrical application
- f. Measurement equipment
- g. Consumer electronics
- h. Telecommunication

cosmo devices shall not be used or related with equipment requiring higher level of quality / reliability, or malfunction, or failure which may cause loss of human life, bodily injury, includes, without limitation:

- a. Medical and other life supporting equipments
- b. Space application
- c. Telecommunication equipment (trunk lines)
- d. Nuclear power control
- e. Equipment used for automotive vehicles, trains, ships...etc.

This publication is the property of cosmo. No part of this publication may be reproduced or copied in any form or any means electronically or mechanically for any purpose, in whole or in part without any written permission expressed from cosmo.