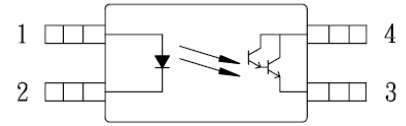


### ● Description

The KPS2802 series consist of a photodarlington optically coupled to a gallium arsenide infrared-emitting diodes in a 4-pin SSOP package. The input-output isolation voltage is rated at 3750Vrms..

### ● Schematic



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

### ● Features

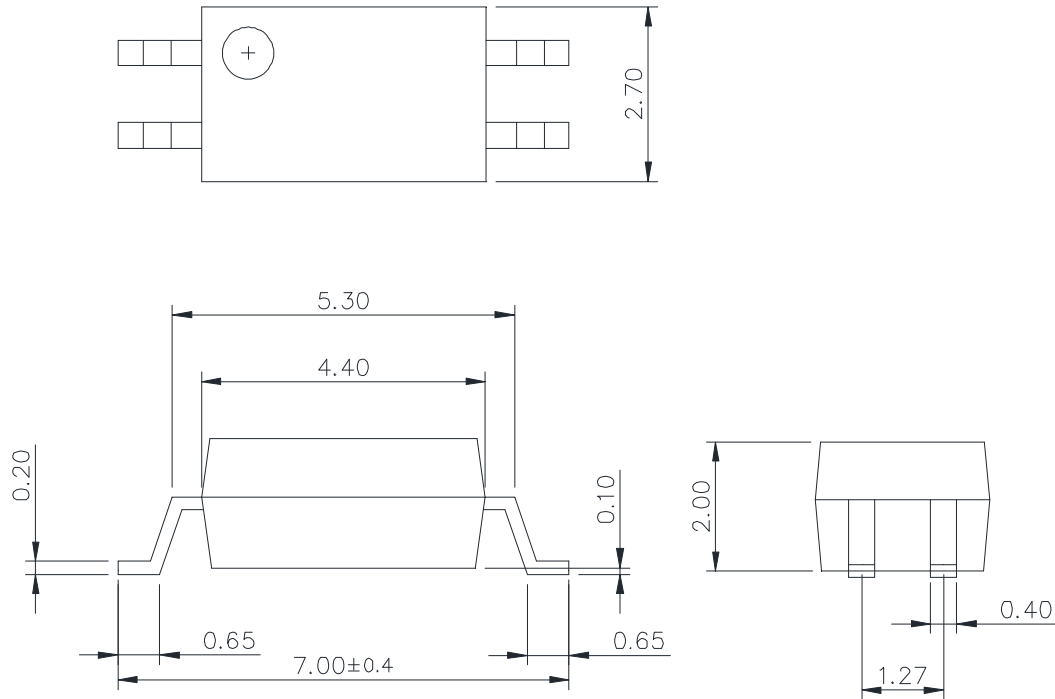
1. Pb free and RoHS compliant
2. High isolation voltage( $V_{ISO}=3750V_{rms}$ )
3. Small and thin package(4pin SSOP, pin pitch 1.27mm)
4. High current transfer ratio (CTR=2000%TYP.@  $I_F=1\text{ mA}$ ,  $V_{CE}=2V$  )
5. MSL class 1
6. Agency Approvals:
  - UL Approved (No. E169586): UL1577
  - c-UL Approved (No. E169586)
  - VDE Approved (No. 40010469): DIN EN60747-5-5
  - FIMKO Approved :EN62368-1, EN60601-1
  - CQC Approved: GB8898-2011, GB4943.1-2011

### ● Applications

- Programmable logic controllers
- Measuring instruments
- Hybrid IC
- General applications

● **Outside Dimension**

Unit : mm



TOLERANCE : ±0.2mm

● **Device Marking**



**Notes:**

2802

YWW

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(*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	$V_{CEO}$	40	V
	Emitter-Collector voltage	$V_{ECO}$	6	V
	Collector current	$I_C$	90	mA
	Collector power dissipation	$P_C$	120	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)

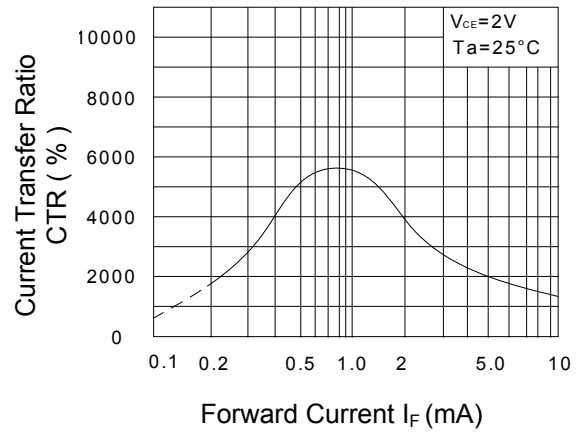
Parameter		Symbol	Conditions	Min.	Typ.	Max.	Unit
Input	Forward voltage	$V_F$	$I_F=5mA$	-	1.1	1.4	V
	Reverse current	$I_R$	$V_R=5V$	-	-	5	μA
	Terminal capacitance	$C_t$	$V=0, f=1MHz$	-	60	-	pF
Output	Collector dark current	$I_{CEO}$	$V_{CE}=40V, I_F=0mA$	-	-	400	nA
Transfer characteristics	Current transfer 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	$5 \times 10^{10}$	$10^{11}$	-	Ω
	Floating capacitance	$C_f$	$V=0, f=1MHz$	-	0.4	-	pF
	Response time (Rise)(*3)	$t_r$	$V_{ce}=5V, I_C=2mA, R_L=100\Omega$	-	200	-	μs
	Response time (Fall)(*3)	$t_f$		-	200	-	μs

\*3 Test Circuit for Switching Time

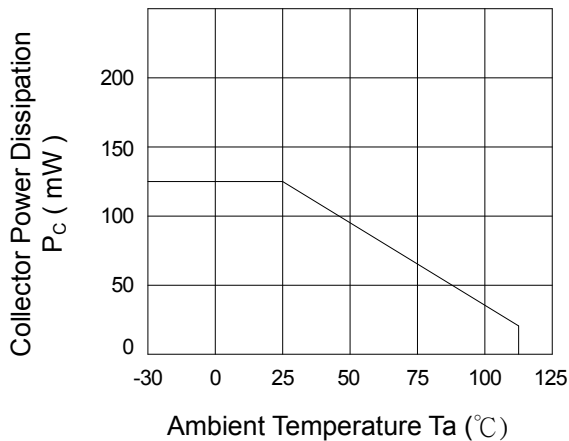
Classification table of current transfer ratio is shown below.

CTR RANK	CTR (%)
KPS28020E	Min.200

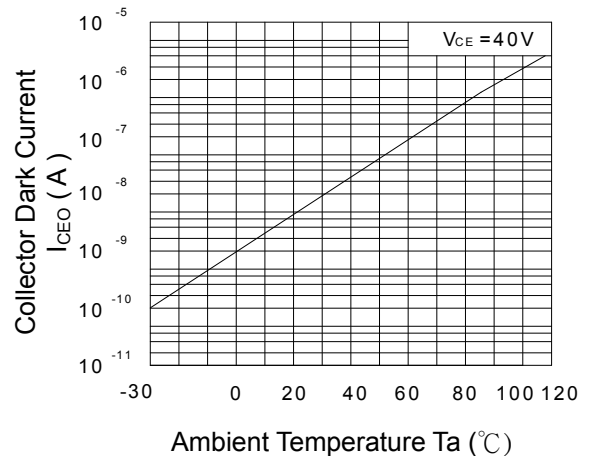
**Fig.1 Current Transfer Ratio vs. Forward Current**



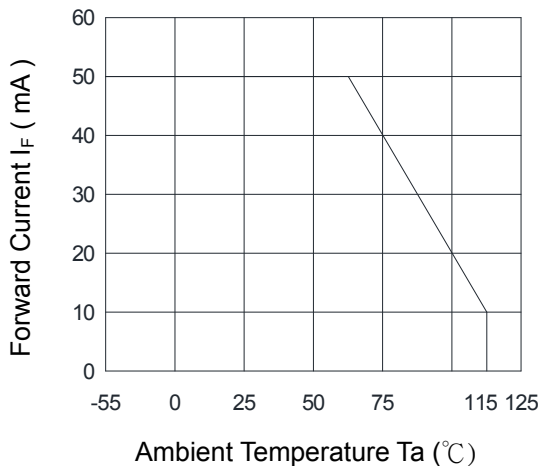
**Fig.2 Collector Power Dissipation vs. Ambient Temperature**



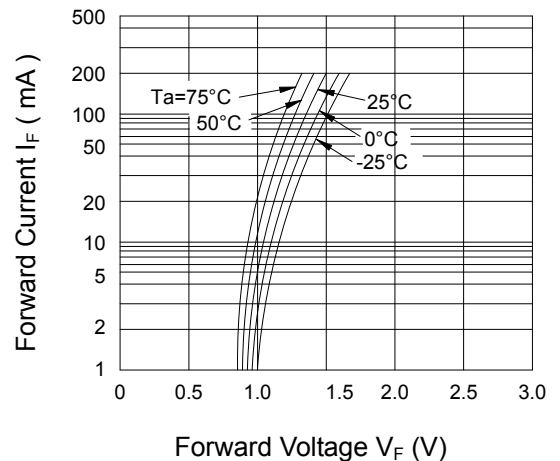
**Fig.3 Collector Dark Current vs. Ambient Temperature**



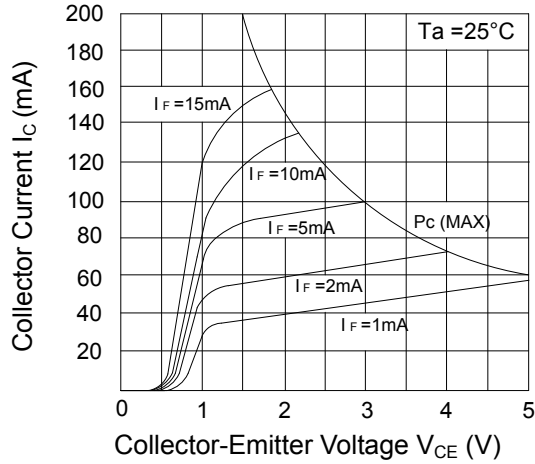
**Fig.4 Forward Current vs. Ambient Temperature**



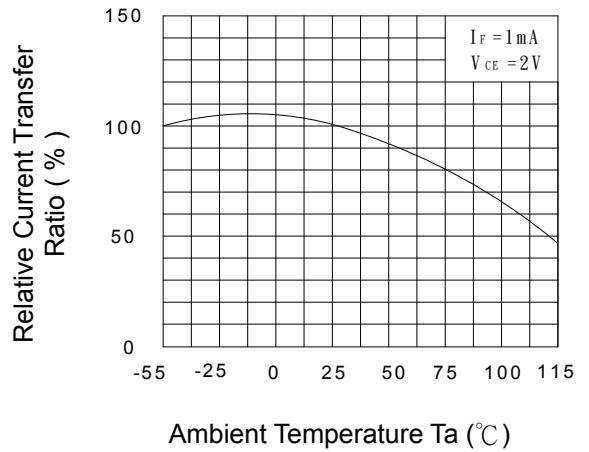
**Fig.5 Forward Current vs. Forward Voltage**



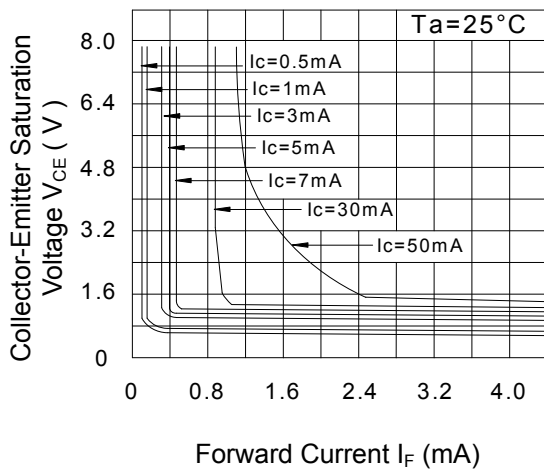
**Fig.6 Collector Current vs. Collector-Emitter Voltage**



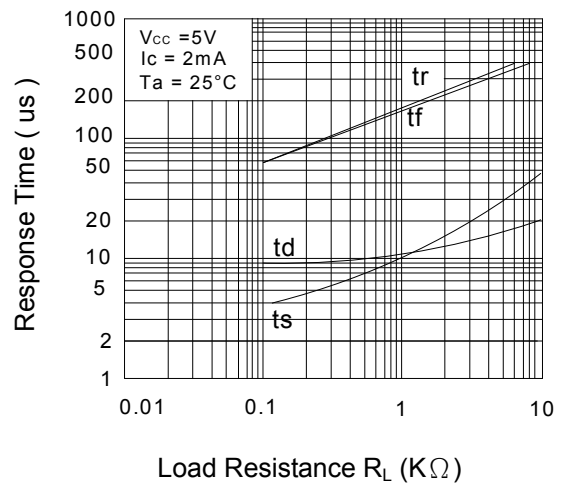
**Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature**



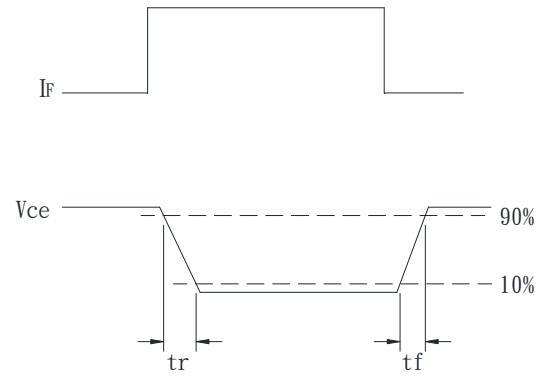
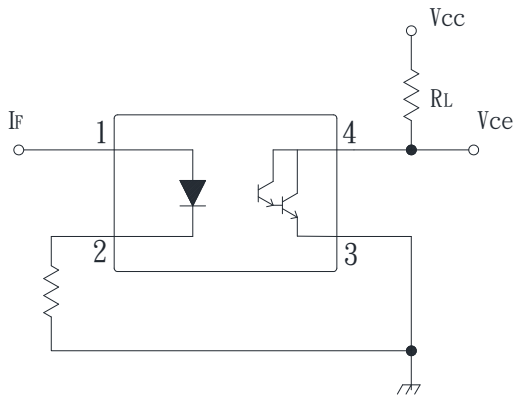
**Fig.8 Collector-Emitter Saturation Voltage vs. Forward Current**



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



● Test Circuit for Response Time

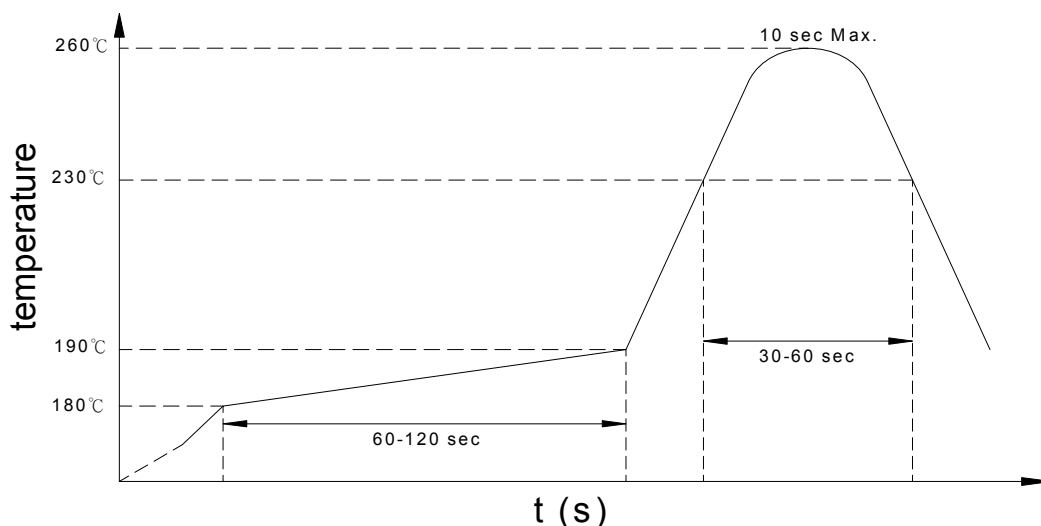


### ● Recommended Soldering Conditions

#### (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**

### KPS2802 Y (Z)

**Notes:**

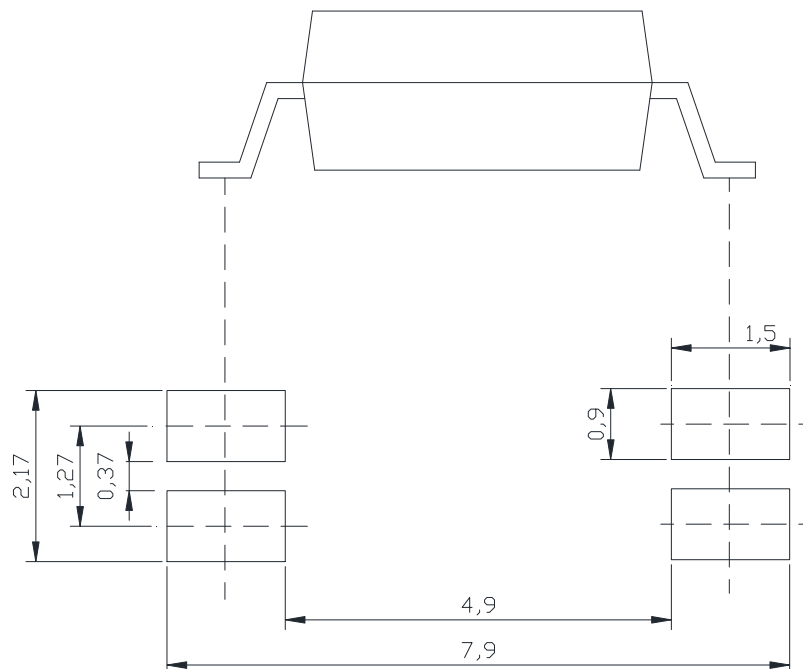
KPS2802 = Part No.

Y = CTR rank (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

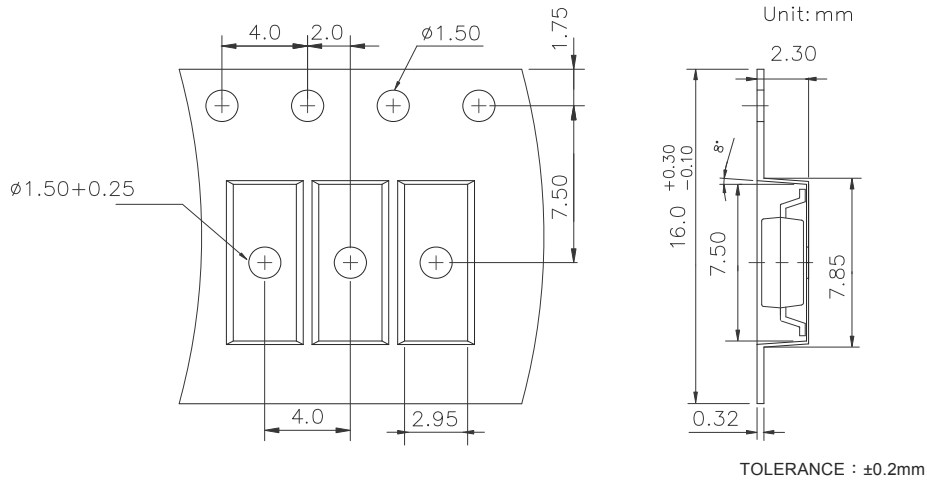
- **Recommended Pad Layout for Surface Mount Lead Form**



Unit : mm

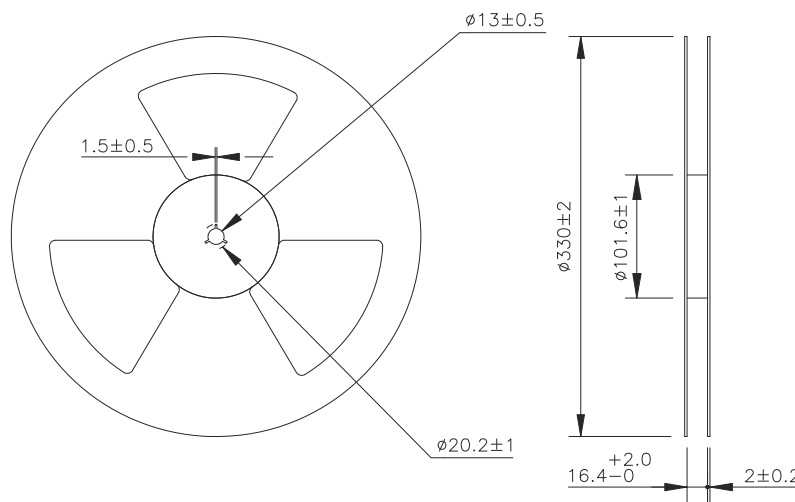
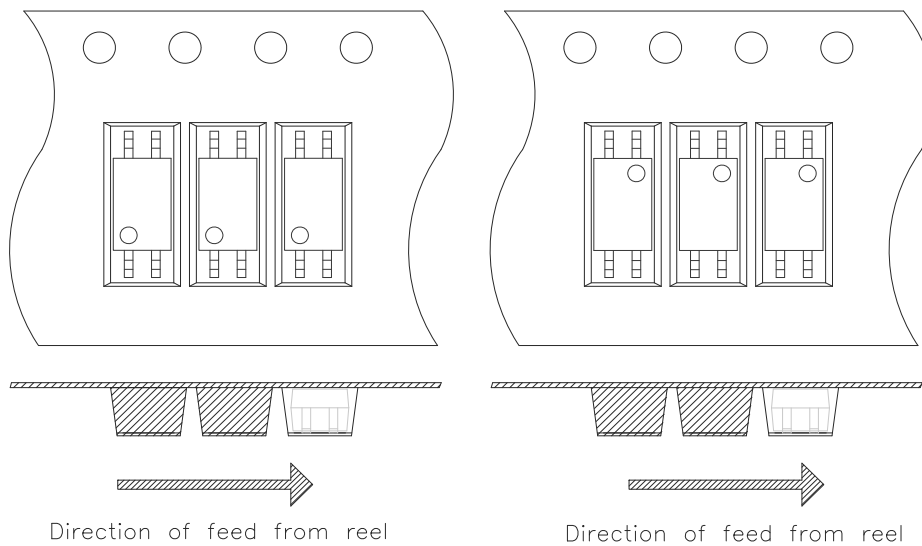


● 4-pin SSOP Carrier Tape & Reel



TLD

TRU





● **Application Notice**

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