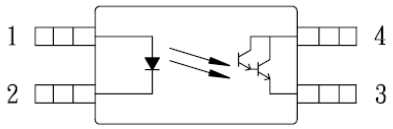
KPS2802 Series

4PIN SSOP PHOTODARLINGTON PHOTOCOUPLER

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

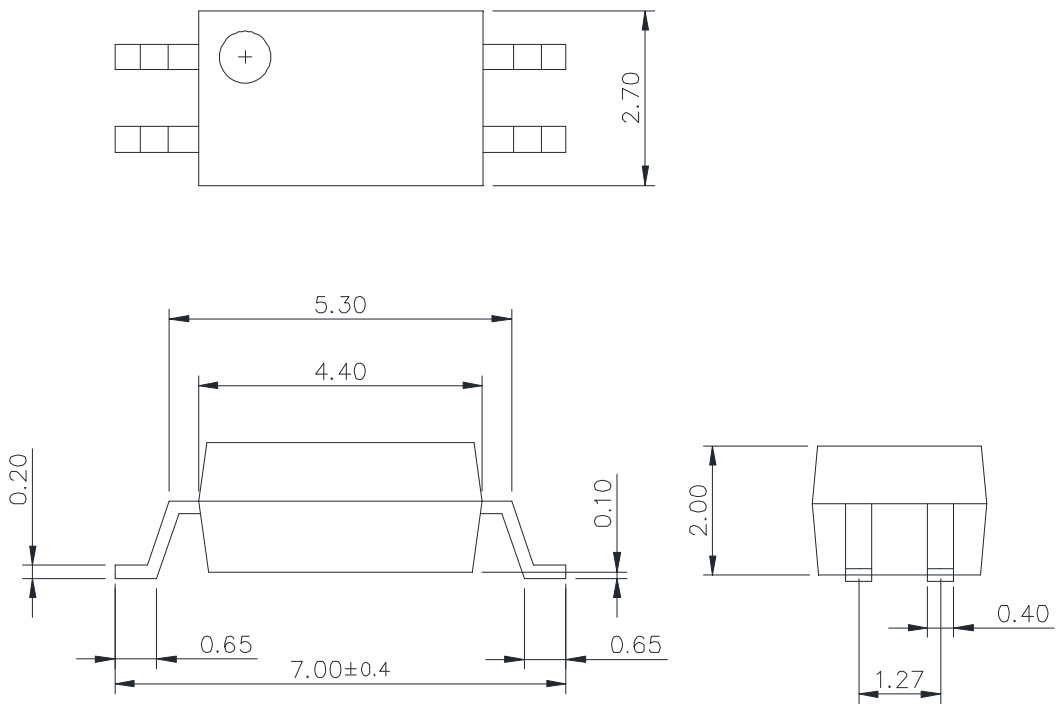
1. Pb free and RoHS compliant
2. High isolation voltage(V_{ISO}=3750Vrms)
3. Small and thin package(4pin SSOP, pin pitch 1.27mm)
4. High current transfer ratio (CTR=2000%TYP.@ I_F=1 mA, V_{CE}=2V)
5. MSL class 1
6. Agency Approvals:
   - UL Approved (No. E169586): UL1577
   - c-UL Approved (No. E169586)
   - 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℃)

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/℃	0.6	mW/℃
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/℃	1.2	mW/℃
Isolation voltage 1 minute(*2)		Viso	3750	Vrms
Operating temperature		Topr	-55 to +115	℃
Storage temperature		Tstg	-55 to +125	℃

*1 PW=100μs,Duty Cycle=1%.
*2 AC voltage for 1minute at T =25℃,RH=60% between input and output.

● Electro-optical Characteristics

(Ta=25℃)

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	Ct	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, Ic=2mA	-	-	1.0	V
	Isolation resistance	Riso	DC500V	$5x10^{10}$	10^{11}	-	Ω
	Floating capacitance	Cf	V=0, f=1MHz	-	0.4	-	pF
	Response time (Rise)(*3)	tr	Vce=5V,Ic=2mA,R_L=100Ω	-	200	-	μs
	Response time (Fall) (*3)	tf		-	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

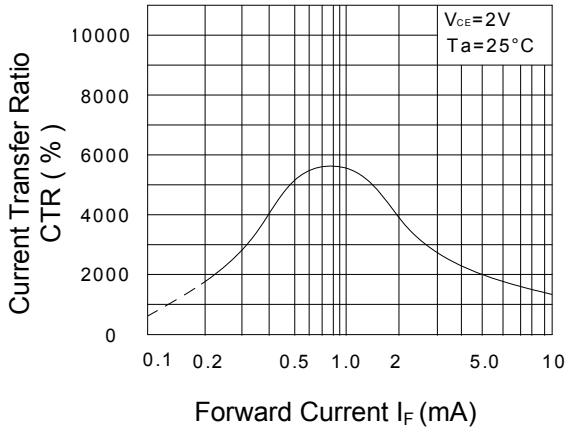


Fig.2 Collector Power Dissipation vs. Ambient Temperature

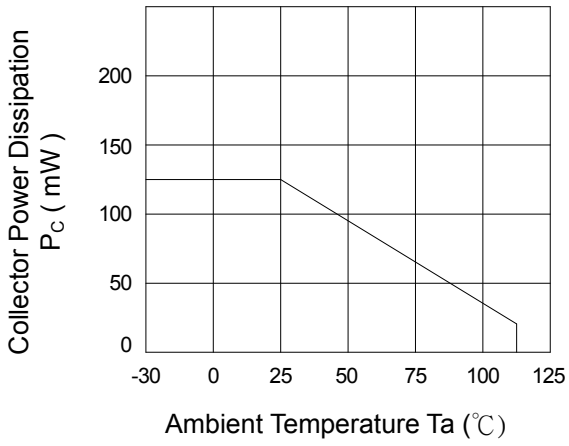


Fig.3 Collector Dark Current vs. Ambient Temperature

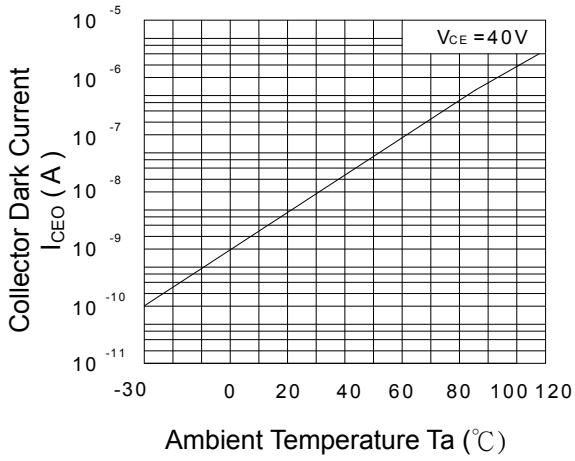


Fig.4 Forward Current vs. Ambient Temperature

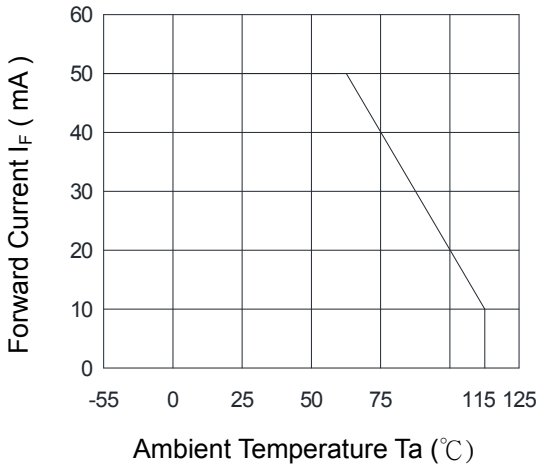


Fig.5 Forward Current vs. Forward Voltage

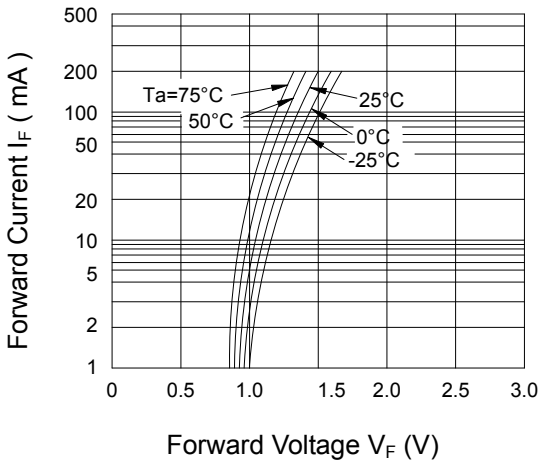


Fig.6 Collector Current vs. Collector-Emitter Voltage

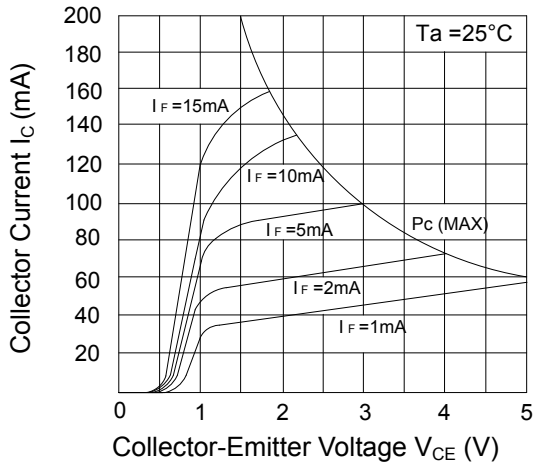


Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

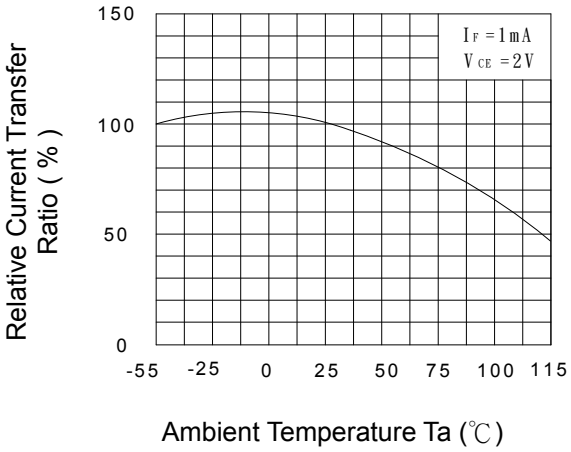


Fig.8 Collector-Emitter Saturation Voltage vs. Forward Current

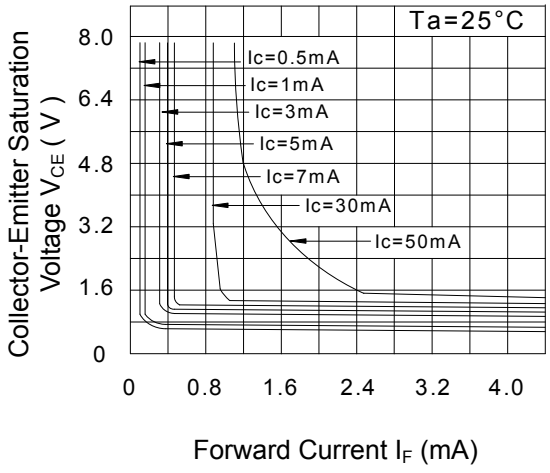
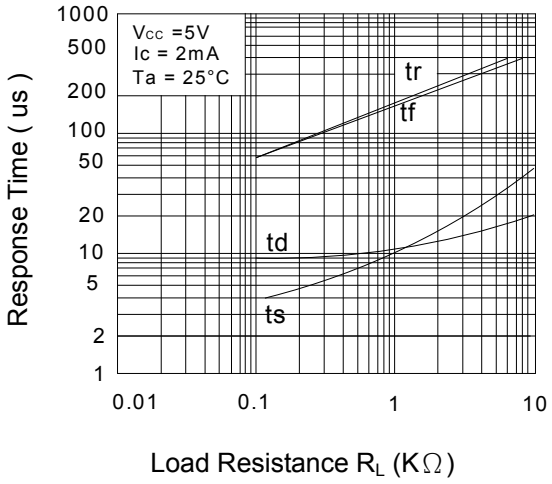
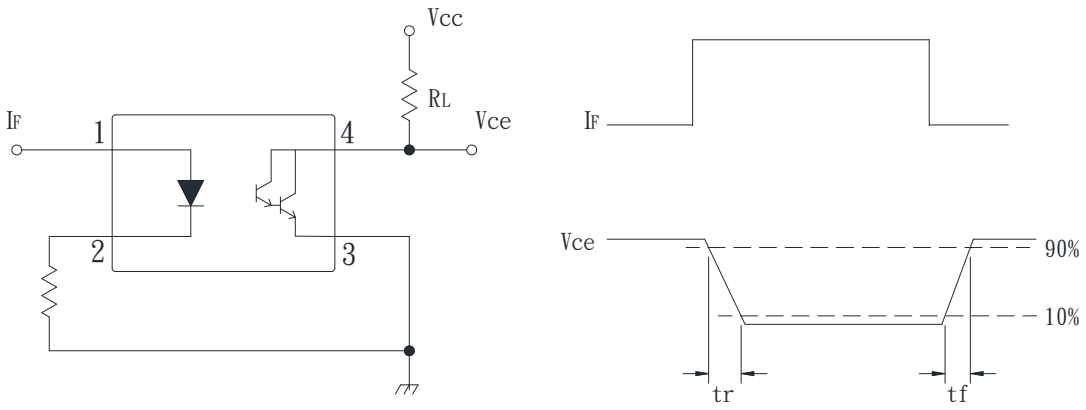


Fig.9 Response Time vs. Load Resistance



- **Test Circuit for Response Time**

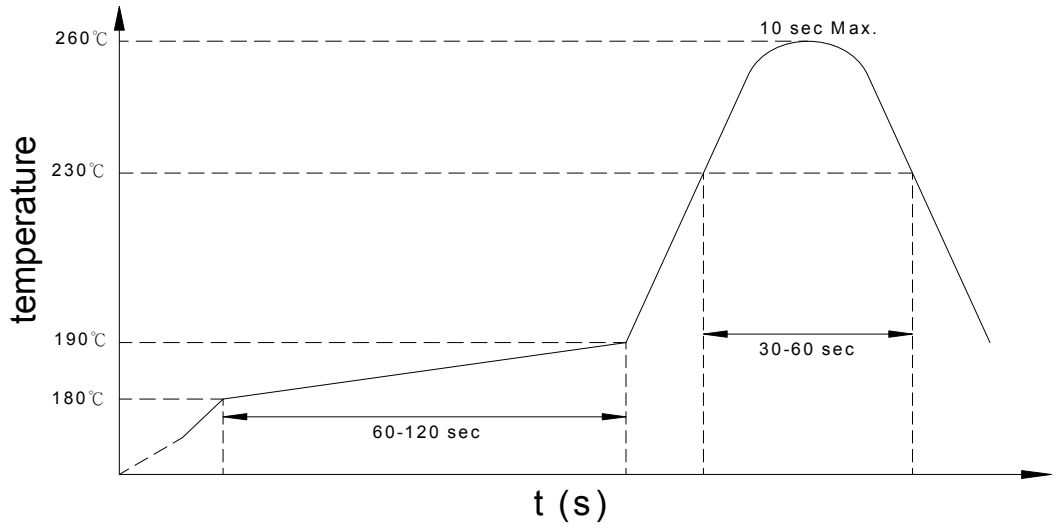


Recommended Soldering Conditions

(a) Infrared reflow soldering：

- Peak reflow soldering： 260℃ or below (package surface temperature)
- Time of peak reflow temperature： 10 sec
- Time of temperature higher than 230℃： 30-60 sec
- Time to preheat temperature from 180~190℃： 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℃ or below (molten solder temperature)
- Time： 10 seconds or less
- Preheating conditions： 120℃ 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:

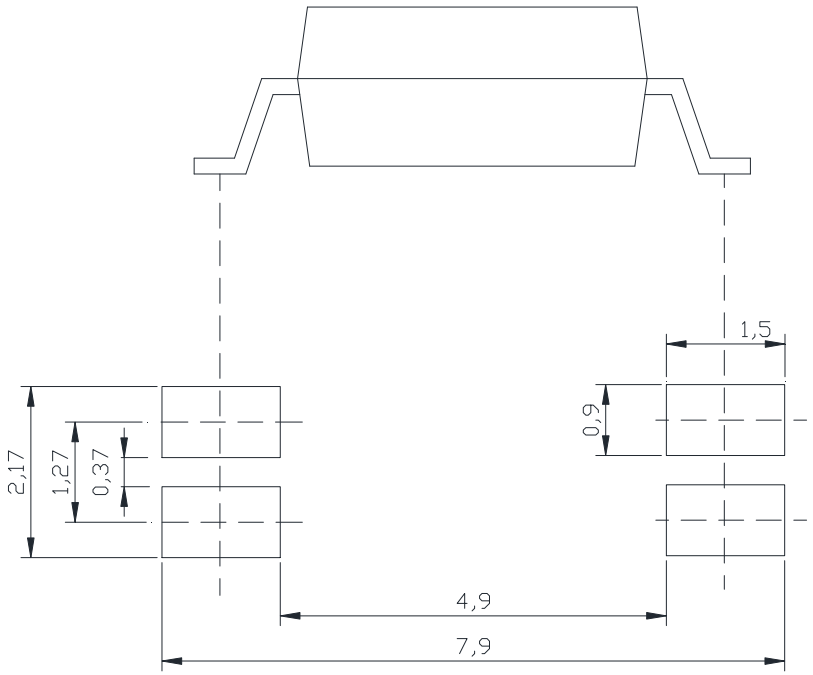
KPS2802 = Part No.

Y = CTR rank (E)

Z = Tape and reel option (TLD、TRU)

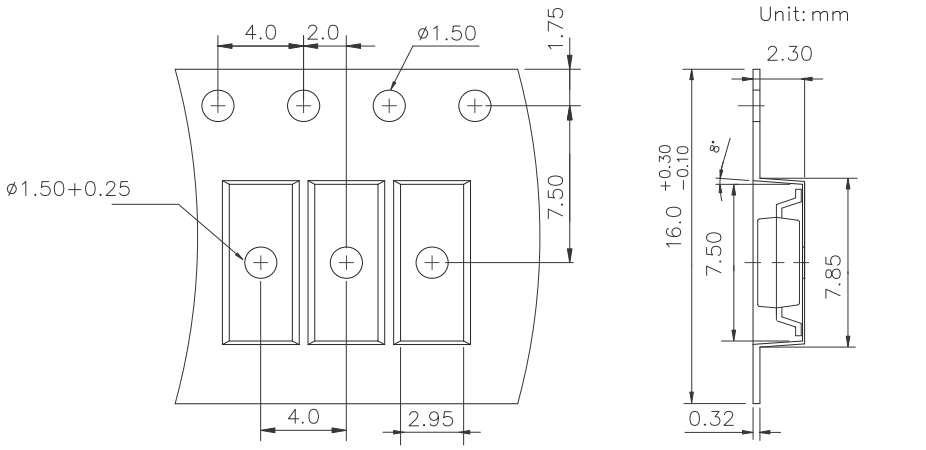
Option	Description	Packing quantity
TLD	TLD tape & reel option	3000 units per reel
TRU	TRU tape & reel option	3000 units per reel

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

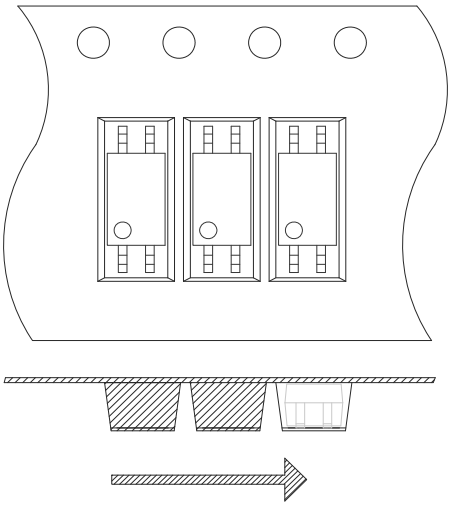


Unit : mm

● 4-pin SSOP Carrier Tape & Reel

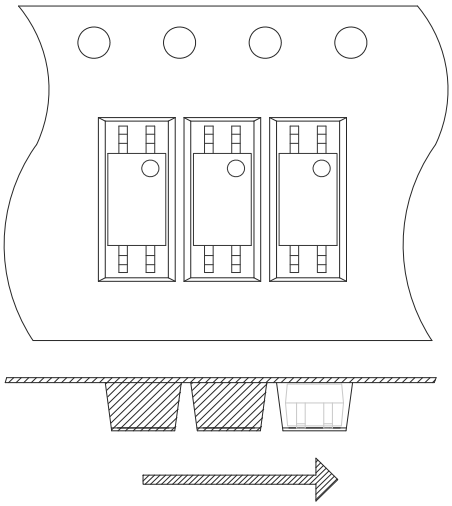


TLD

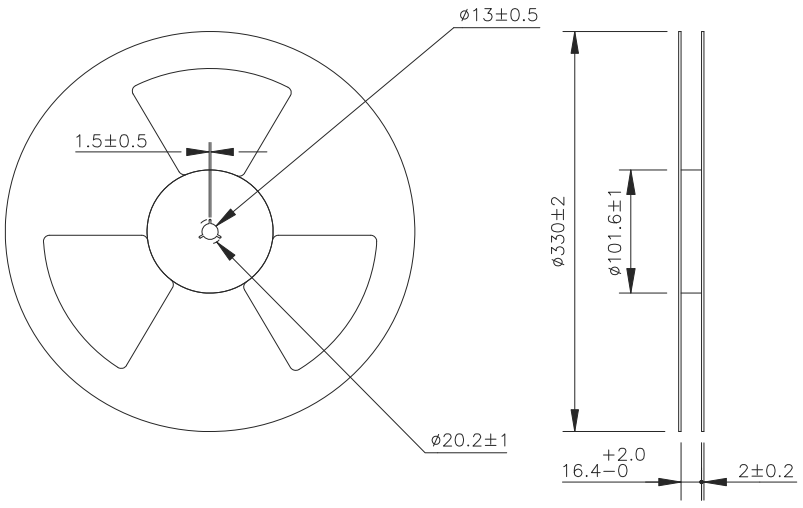


Direction of feed from reel

TRU



Direction of feed from reel



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