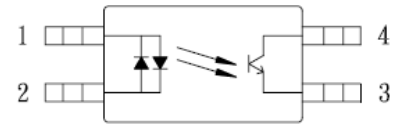


● Description

The KPS2805 series consist of two infrared emitting diodes, connected in inverse parallel, optically coupled to a phototransistor detector. They are packaged in a 4-pin SSOP package. The input-output isolation voltage is rated at 3750Vrms..

● Schematic



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

● Features

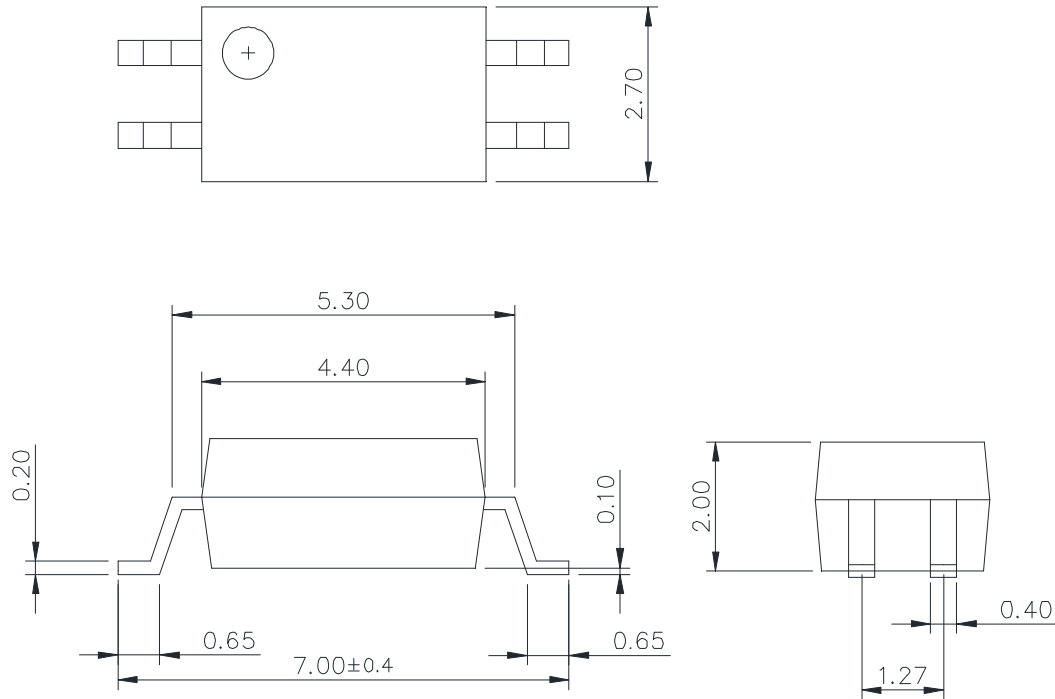
1. Pb free and RoHS compliant
2. High isolation voltage ($V_{ISO}=3750Vrms$)
3. Small and thin package (4pin SSOP, pin pitch 1.27mm)
4. High collector to emitter voltage ($V_{CEO}=80V$).
5. AC input response
6. High-speed switching $t_r=3\mu s$ (typ.), $t_f=5\mu s$ (typ.)
7. MSL class 1
8. Agency Approvals:
 - 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

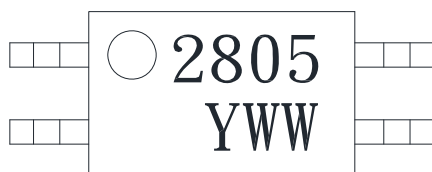
● **Outside Dimension**

Unit : mm



TOLERANCE : ±0.2mm

● **Device Marking**



Notes:

2805

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 |
| | 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 | $I_F=\pm 5mA$ | - | 1.1 | 1.4 | V |
| | Terminal capacitance | C_t | $V=0, f=1MHz$ | - | 60 | - | pF |
| Output | Collector dark current | I_{CEO} | $V_{CE}=80V, I_F=0mA$ | - | - | 100 | nA |
| Transfer characteristics | Current transfer ratio | CTR | $I_F=\pm 5mA, V_{CE}=5V$ | 50 | - | 600 | % |
| | CTR ratio*1 | CTR1/CTR2 | $I_F=5mA, V_{CE}=5V$ | 0.3 | 1.0 | 3.0 | |
| | Collector-Emitter saturation voltage | VCE(sat) | $I_F=\pm 10mA, I_C=2mA$ | - | - | 0.3 | V |
| | Isolation resistance | Riso | DC500V | 5×10^{10} | 10^{11} | - | Ω |
| | Floating capacitance | C_f | $V=0, f=1MHz$ | - | 0.4 | - | pF |
| | Response time (Rise) (*3) | tr | $V_{ce}=5V, I_C=2mA, R_L=100\Omega$ | - | 3 | 18 | μs |
| | Response time (Fall) (*3) | tf | | - | 5 | 18 | μs |

*3 Test Circuit for Switching Time

Classification table of current transfer ratio is shown below.

| CTR Rank. | CTR (%) |
|-----------|------------|
| KPS28050E | 50 TO 600 |
| KPS28050C | 200 TO 400 |

Fig.1 Current Transfer Ratio vs. Forward Current

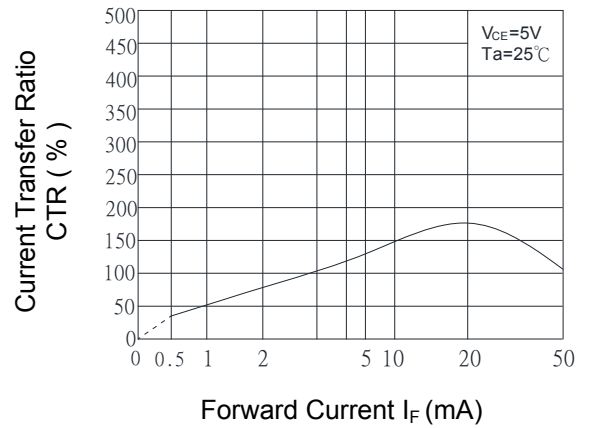


Fig.2 Collector Power Dissipation vs. Ambient Temperature

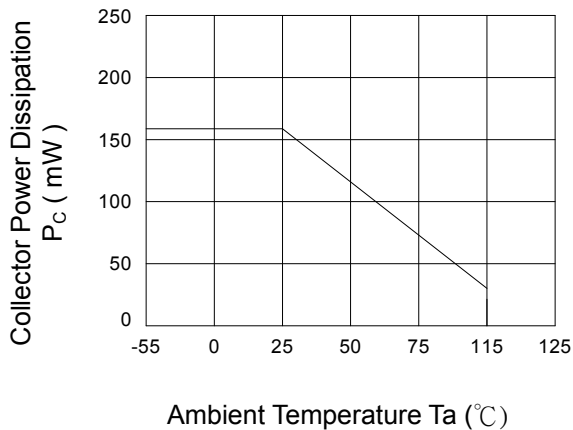


Fig.3 Collector Dark Current vs. Ambient Temperature

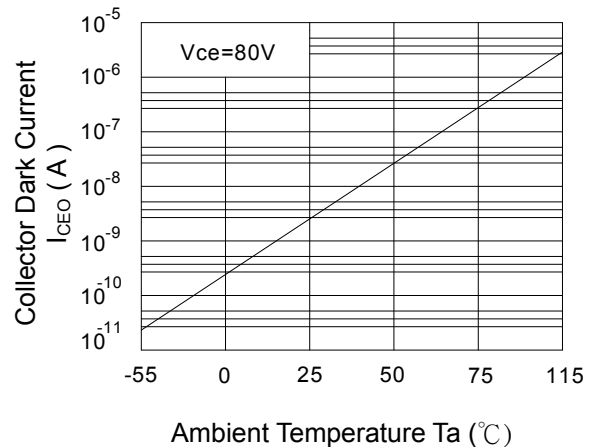


Fig.4 Forward Current vs. Ambient Temperature

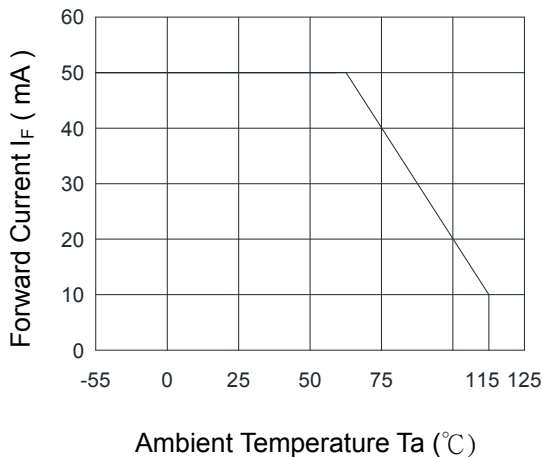


Fig.5 Forward Current vs. Forward Voltage

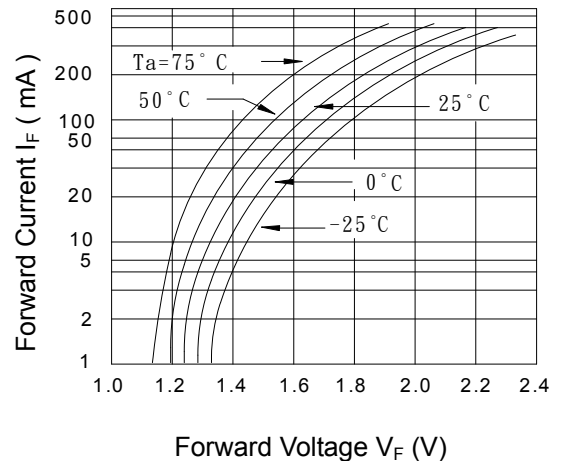


Fig.6 Collector Current vs. Collector-Emitter Voltage

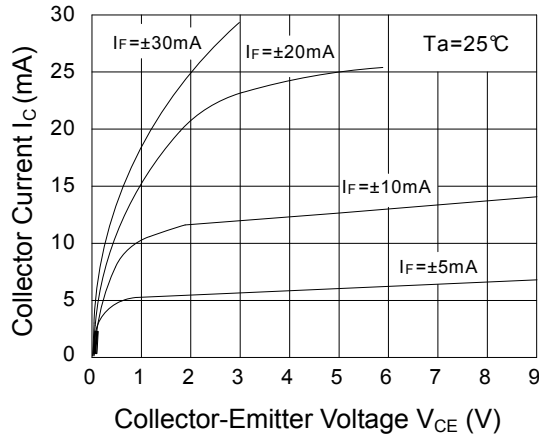


Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

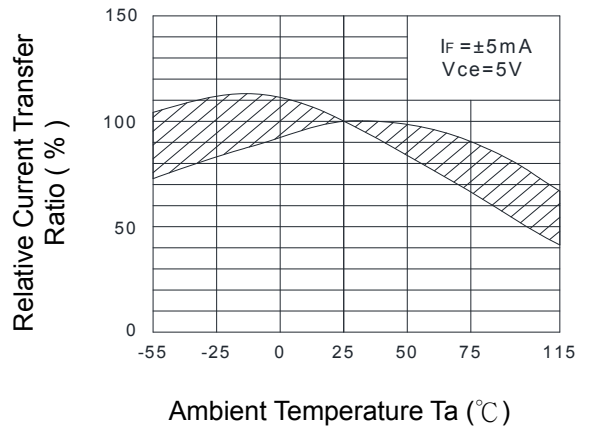


Fig.8 Collector-Emitter Saturation Voltage vs. Ambient Temperature

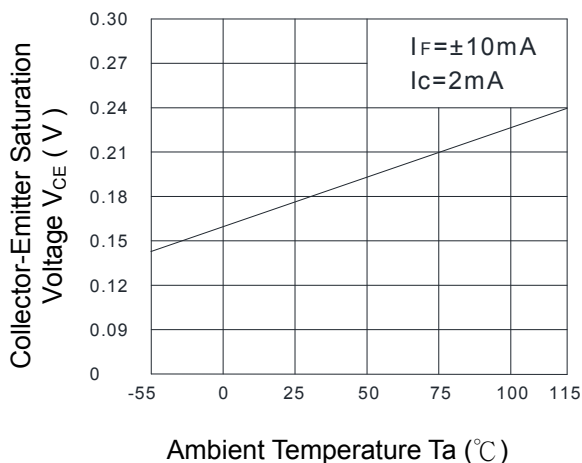


Fig.9 Collector-Emitter Saturation Voltage vs. Forward Current

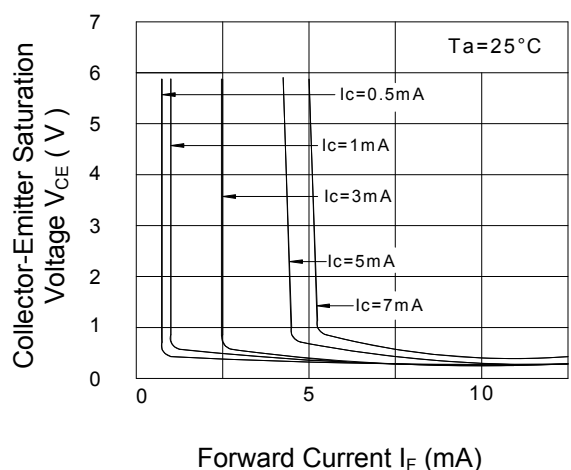


Fig.10 Response Time (Rise) vs. Load Resistance

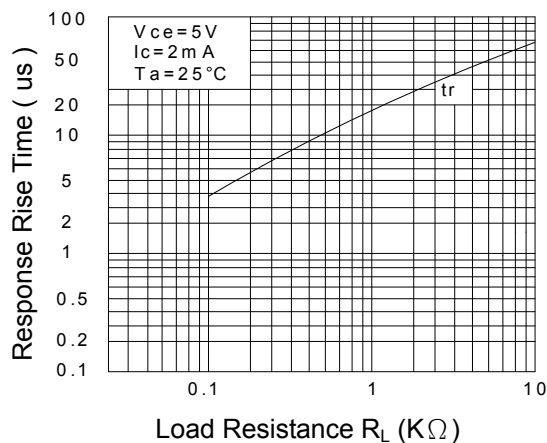
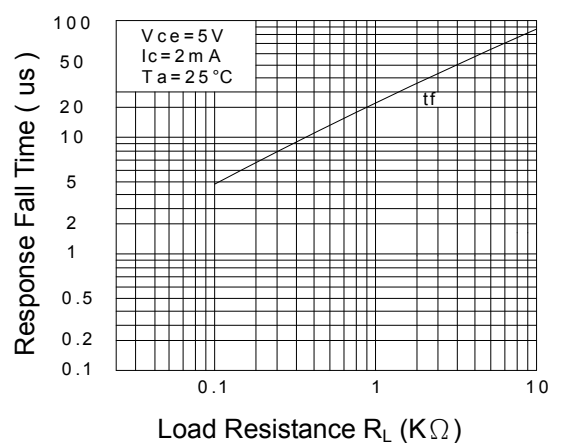
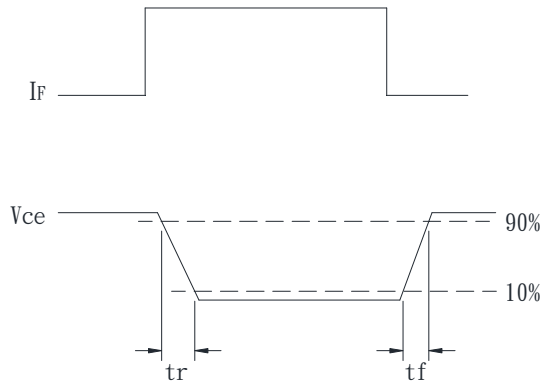
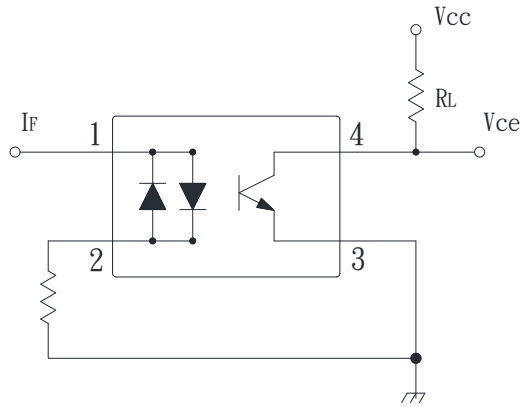


Fig.11 Response Time (Fall) vs. Load Resistance



● Test Circuit for Response Time

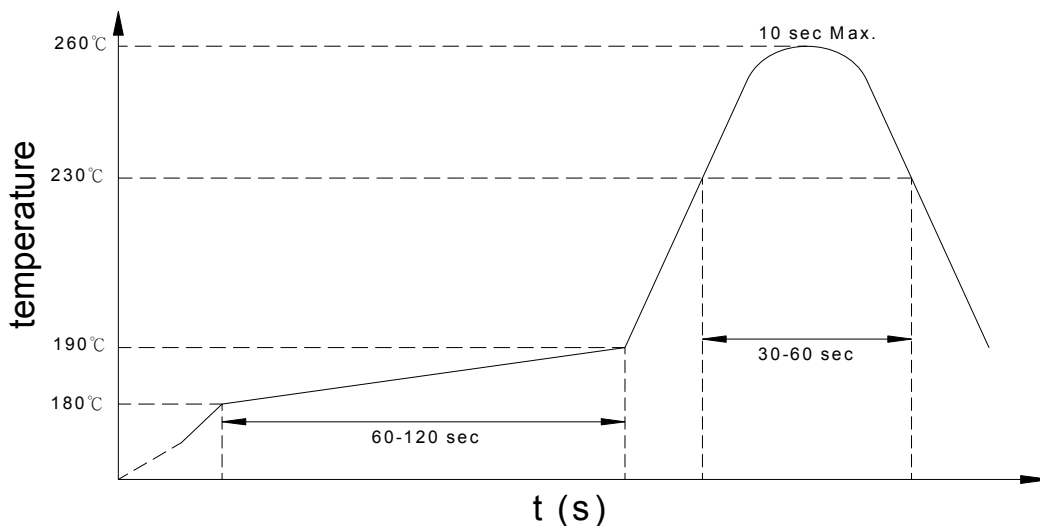


● **Recommended Soldering Conditions**

(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**

KPS2805 Y (Z)

Notes:

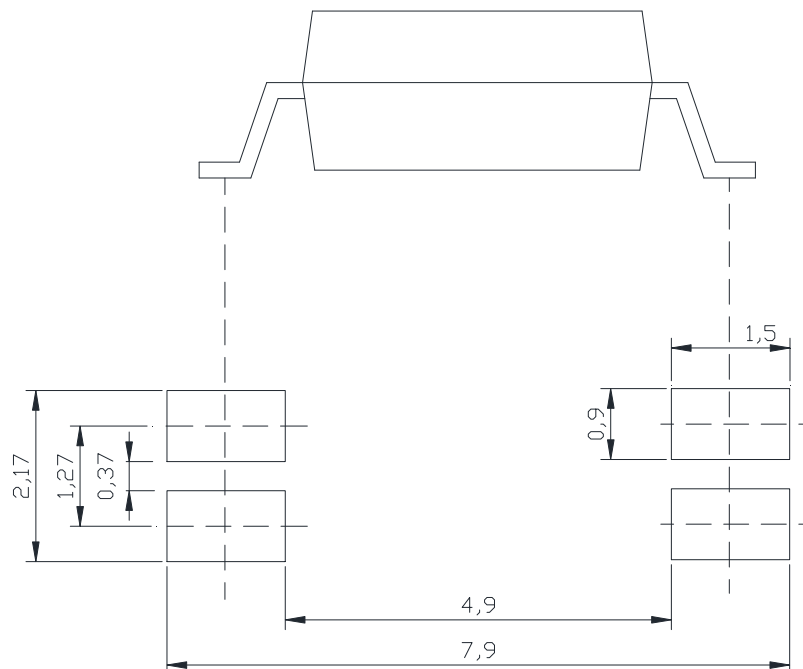
KPS2805 = Part No.

Y = CTR rank option (C · E)

Z = Tape and reel option (TLD · TRU)

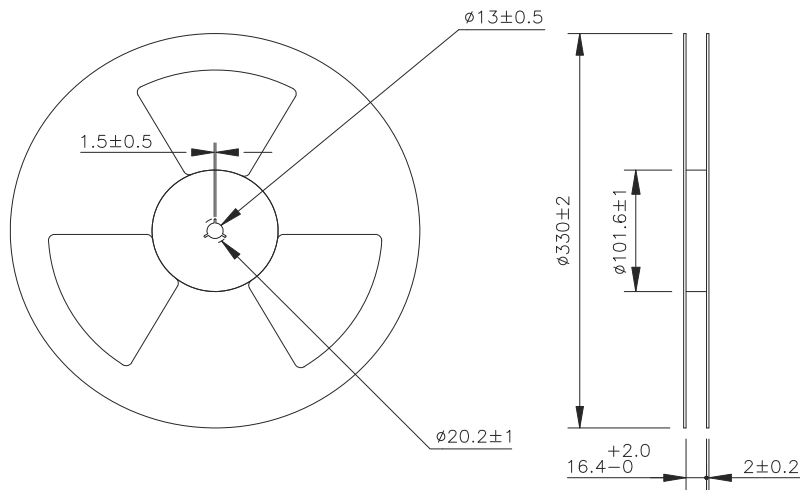
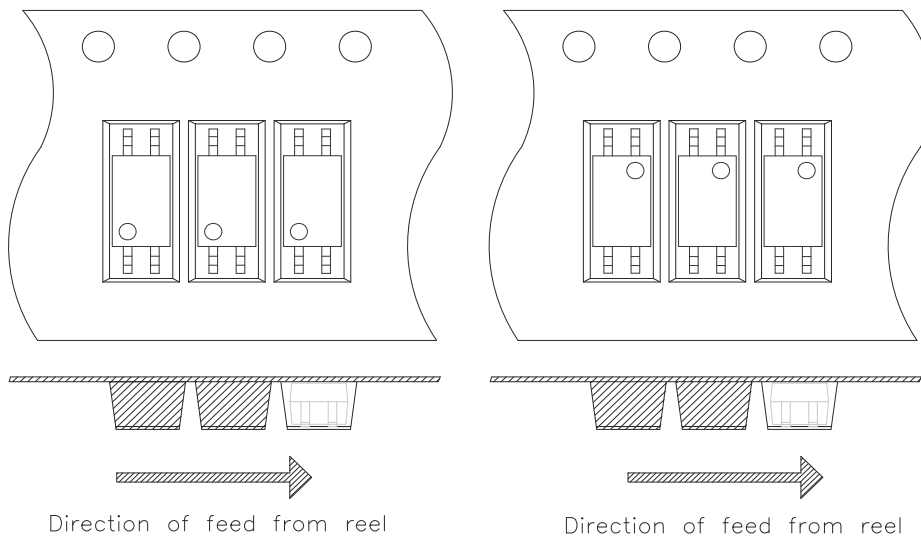
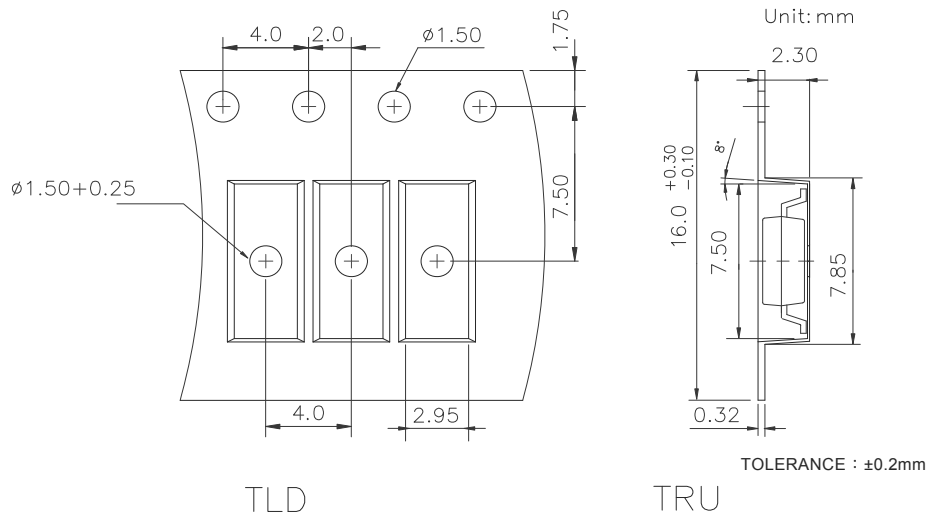
| Option | Description | Packing quantity |
|--------|------------------------|---------------------|
| TLD | TLD tape & reel option | 3000 units per reel |
| TRU | TRU tape & reel option | 3000 units per reel |

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



Unit : mm

● 4-pin SSOP Carrier Tape & Reel



- **Application Notice**

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