● **cosmo**

● **Description**

    The KCP1017 series is robust, ideal for telecom and ground fault applications. It is a SPST normally open switch (1 Form A) that replaces electromechanical relays in many applications. It is constructed using a GaAlAs LED for actuation control and an integrated monolithic die for the switch output. The die, fabricated in a high-voltage dielectrically isolated technology, is comprised of a photodiode array, switch control circuitry and MOSFET switches.

● **Schematic**
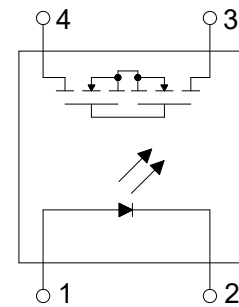
1 FORM A
NORMALLY OPEN
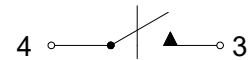
● **Features**

1. Normally open, single pole single throw

2. Control 60V AC or DC Voltage

3. Switch 130mA Loads

4. Controls low-level analog signals

5. High sensitivity, low ON resistance

6. Low-level off-state leakage current

7. High isolation Voltage

8. Pb free and RoHS compliant

9. MSL class 1

10. Agency Approvals：

    • UL Approved (No. E108430): UL508

    • C-UL Approved (No. E108430)

    • FIMKO Approved: EN62368-1, EN60601-1

    • VDE Approved (No. 40053989): EN60747-5-5

● **Application**

    • Telecommunications (PC, electronic notepad)

    • Modem

    • Telephone equipment

    • Security equipment

    • Sensors

    • Measuring and testing equipment

    • Factory automation equipment

    • High speed inspection machines

● **Outside Dimension**

Unit：mm

4.40±0.5

0.50

7.00±0.4

3.90±0.5

2.0±0.5

0.10±0.10

0.40

2.54
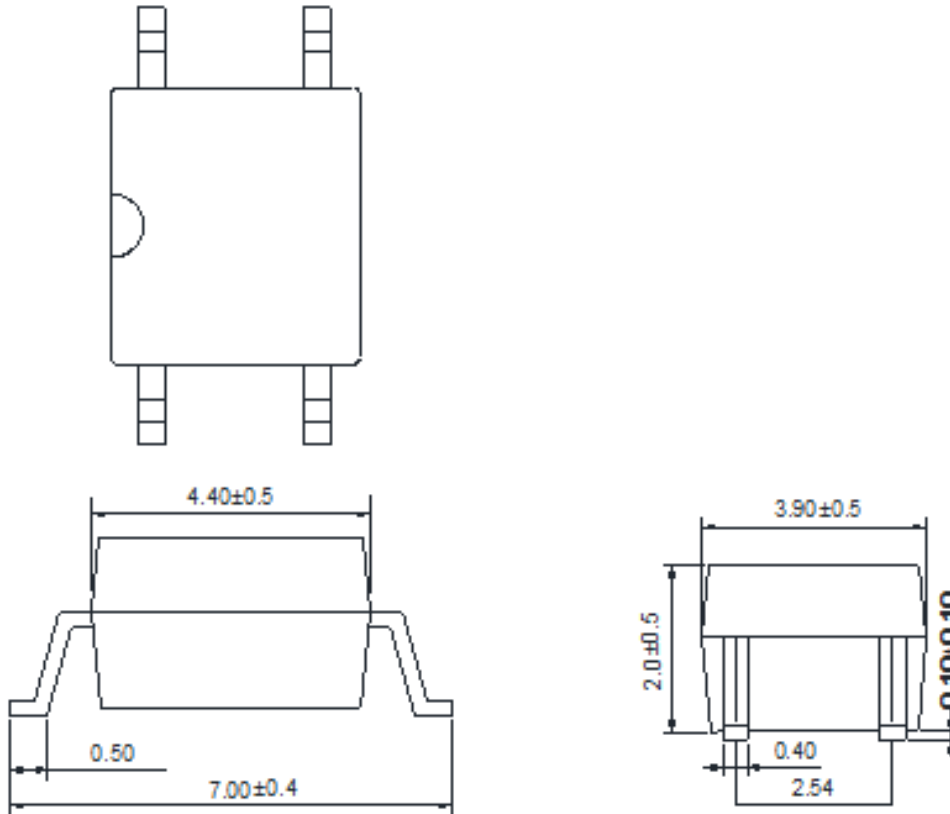
TOLERANCE : ±0.2mm

● **Device Marking**

cosmo
1017
YWW

Notes：

cosmo
1017
YWW   Y：Year code / W：Week code

● Absolute Maximum Ratings

(Ta=25℃)

Item		Symbol	Rating	Unit
Input	Continuous forward current	I_F	50	mA
	Peak forward current	I_{FP}	1	A
	Reverse voltage	V_R	5	V
	Power dissipation	P_{in}	100	mW
	Derate linearly from 25℃	-	1.3	mW/℃
Output	Breakdown voltage	V_B	60	V
	Continuous load current	I_L	130	mA
	Power dissipation	P_{out}	500	mW
Isolation voltage		V_{iso}	1500	Vrms
Isolation resistance (Vio=500V)		R_{iso}	$\geqq 10^{10}$	Ω
Total power dissipation		P_t	550	mW
Derate linearly from 25℃		-	2.5	mW/℃
Operating temperature		T_{opr}	-40 to +85	℃
Storage temperature		T_{stg}	-40 to +125	℃
Junction temperature		T_j	100	℃
Soldering temperature 10 seconds		T_{sot}	260	℃

● Electro-optical Characteristics

(Ta=25℃)

Parameter		Symbol	Conditions	Min.	Typ.	Max.	Unit
Input	Forward voltage	V_F	I_F=10mA	-	1.2	1.5	V
	Operation input current	I_{FON}	V_L=20V, I_L=100mA	-	-	1.0	mA
	Recovery input Voltage	V_{FOFF}	V_L=20V, $I_L \leqq$5µA	0.5	-	-	V
Output	Breakdown voltage	V_B	I_B=50µA	60	-	-	V
	Off-state leakage current	I_{LEAK}	V_L=60V, I_F=0mA	-	0.2	1.0	µA
I/O capacitance		C_{iso}	V_B=0V, f=1MHz	-	6	-	pF
ON resistance		R_{ON}	I_F=10mA, I_L=100mA	-	7	16	Ω
Turn-on time		T_{ON}	I_F=10mA, V_L=20V	-	0.3	1.0	ms
Turn-off time		T_{OFF}	I_L=100mA, t=10ms	-	0.1	1.0	ms

● Turn-on / Turn-off Time
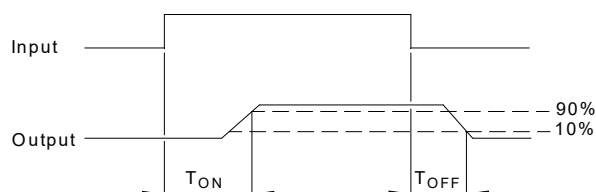
● **Schematic and Wiring Diagrams**
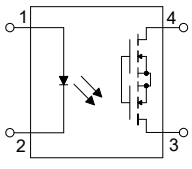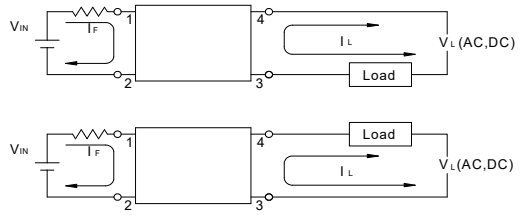
Schematic	Output Configuration	Load	Connection	Wiring Diagrams
	1a	AC DC	-	

**Fig.1   Load Current
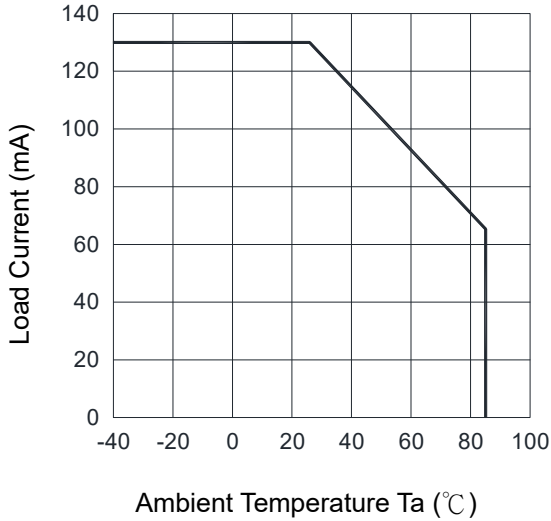vs. Ambient Temperature**

**Fig.2   On Resistance
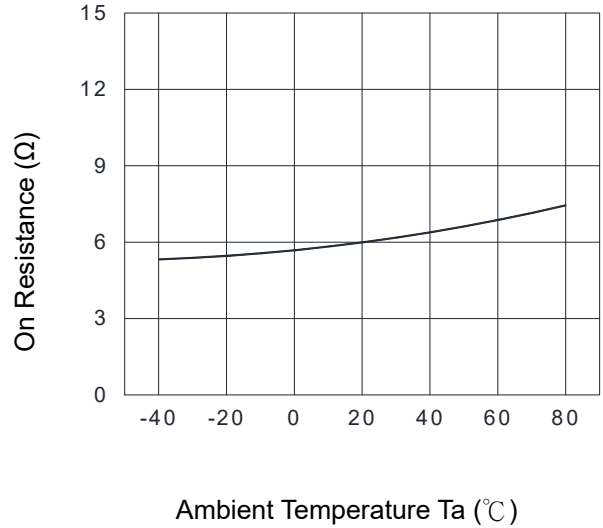vs. Ambient Temperature**

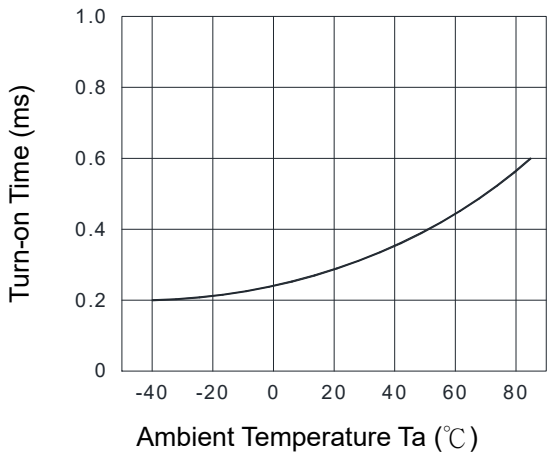**Fig.3   Turn-on Time
vs. Ambient Temperature**

**Fig.4   Turn-off Time
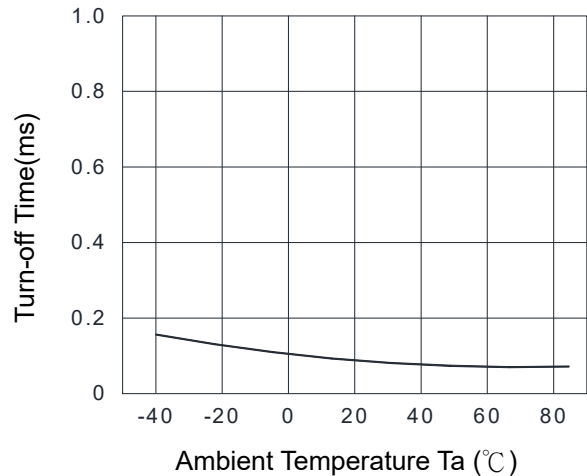vs. Ambient Temperature**

**Fig.5   LED Operate Current
vs. Ambient Temperature**
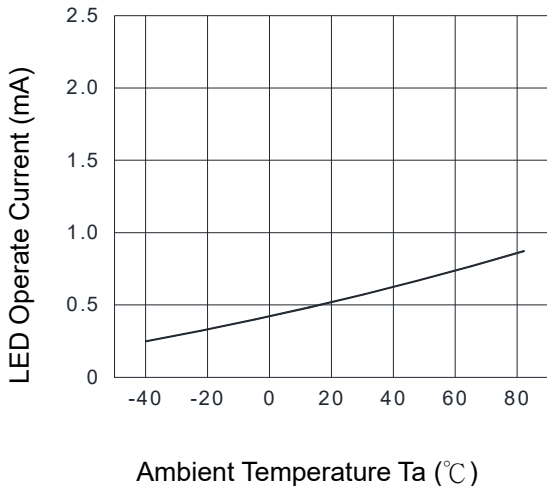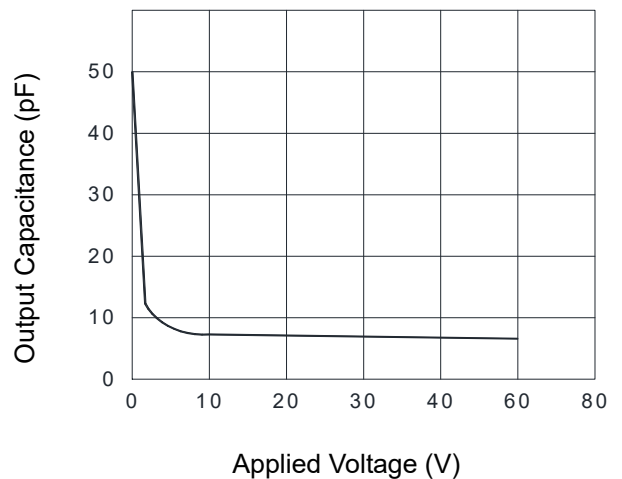

**Fig.6   Output Capacitance
vs. Applied Voltage**

**Fig.7   LED Dropout Voltage
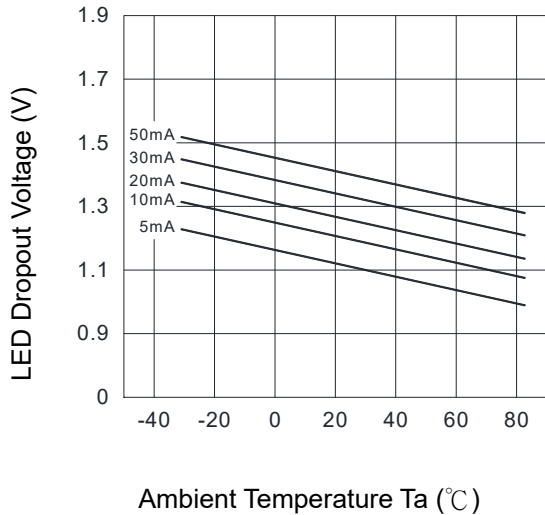vs. Ambient Temperature**

LED Dropout Voltage (V)

50mA
30mA
20mA
10mA
5mA

Ambient Temperature Ta (℃)

**Fig.8   Voltage vs. Current Characteristics
of Output at MOSFET Portion**

Current (mA)

Voltage (V)

**Fig.9   Turn-on Time
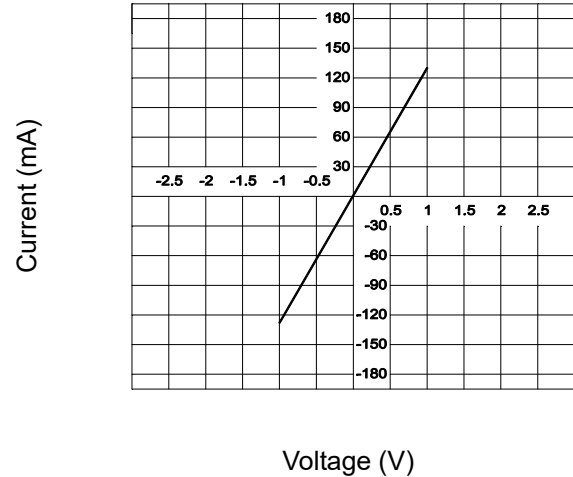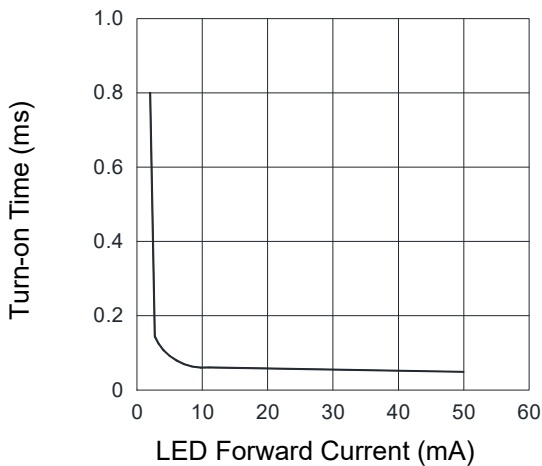vs. LED Forward Current**

Turn-on Time (ms)

LED Forward Current (mA)

**Fig.10   Off-state Leakage Current
vs. Load Voltage**

Off-state Leakage Current (A)

Load Voltage (V)
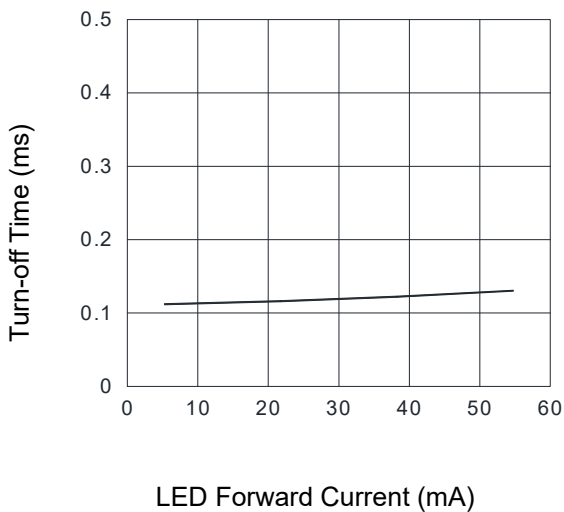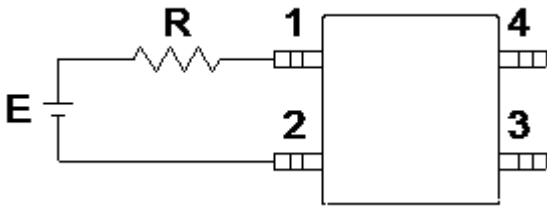
**Fig.11   Turn-on Time
vs. LED Forward Current**
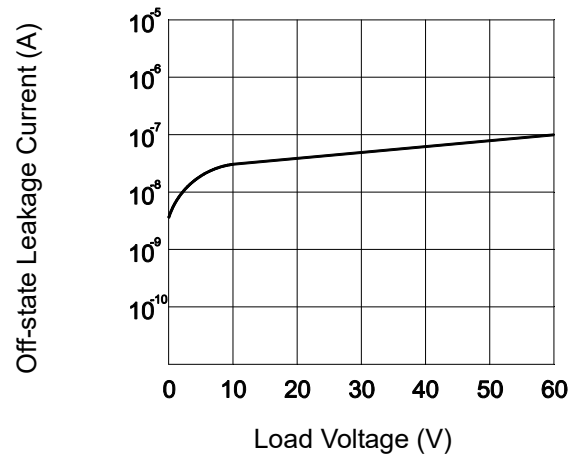
Turn-off Time (ms)

LED Forward Current (mA)

● **Using Methods**

Examples of resistance value to control LED forward current (I_F=1mA)

E	R
3.3V	Approx. 1.5K Ω
5V	Approx. 3.0K Ω
12V	Approx. 8.7K Ω
15V	Approx. 11.2K Ω
24V	Approx. 18.7K Ω

1. LED forward current must be more than 1mA，at E min.
2. LED forward current must be less than 50mA，at E max.
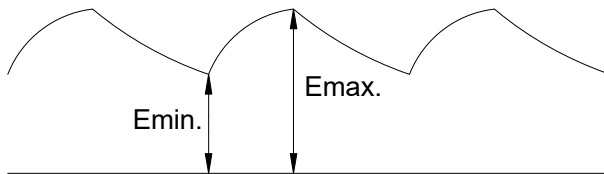
Regulate the spike voltage generated on the inductive load as follows：
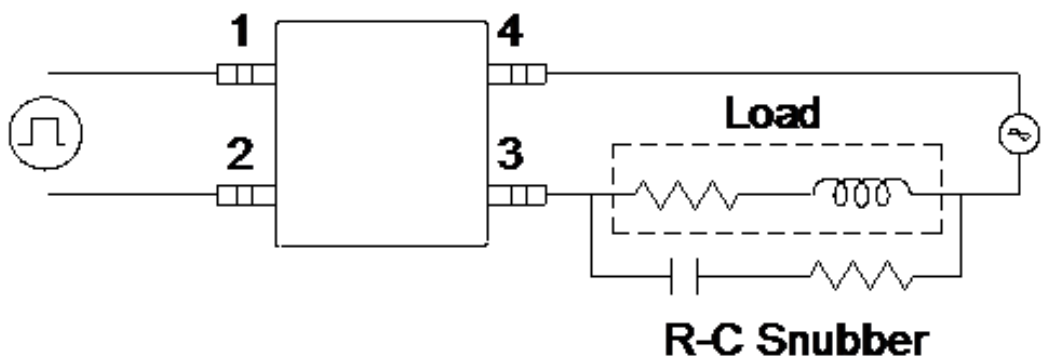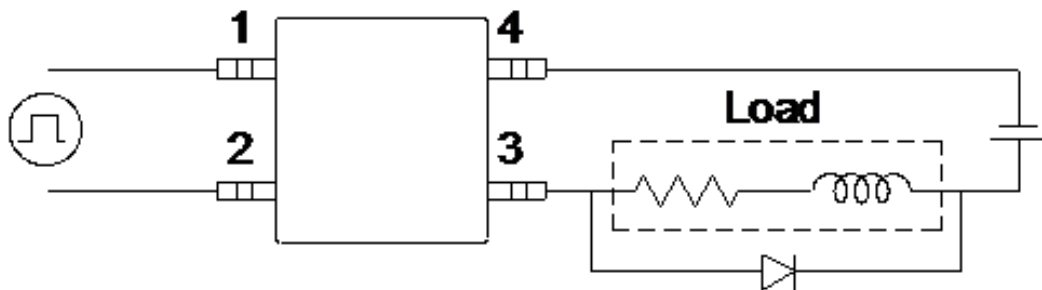
● **Recommended Soldering Conditions**

(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   60-120 sec

     180~190℃：   Two

■ Number of reflows：   Rosin flux containing small amount of chlorine

■ Flux：   (The flux with a maximum chlorine content of 0.2

     Wt% is recommended.)

Recommended Temperature Profile of Infrared Reflow
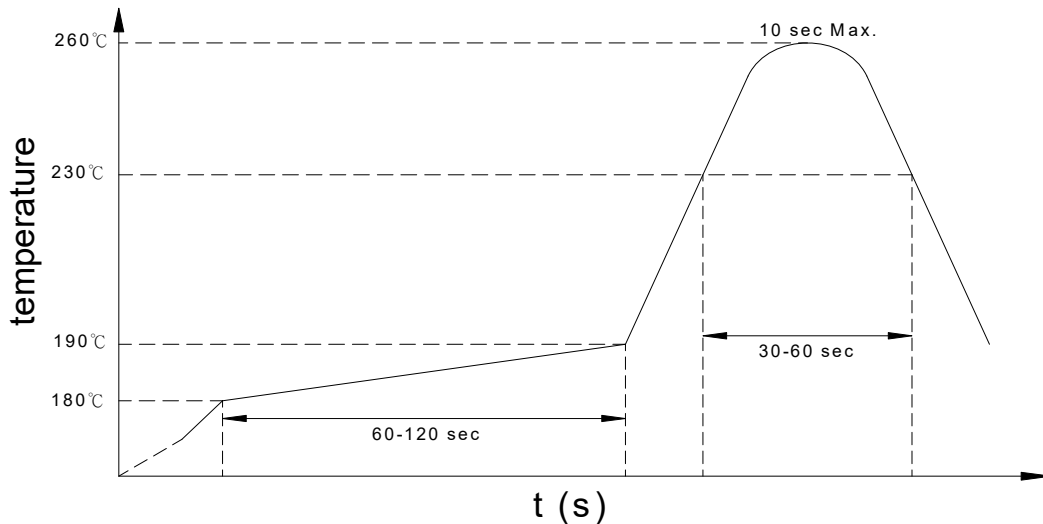
(b) Wave soldering：

■ Temperature：   260℃ or below (molten solder temperature)

■ Time：   10 seconds or less

■ Preheating conditions: 120℃ or below (package surface temperature)

■ Number of times：   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**

KCP1017 (X)

Note：

KCP1017 = Part No.

X = Tape and reel option (TLD、TRU)

Option	Description	Packing quantity
TLD	small outline for surface mount type package + TLD tape & reel option	3000 units per reel
TRU	small outline for surface mount type package + TRU tape & reel option	3000 units per reel

● **Recommended Pad Layout for Surface Mount Lead Form**
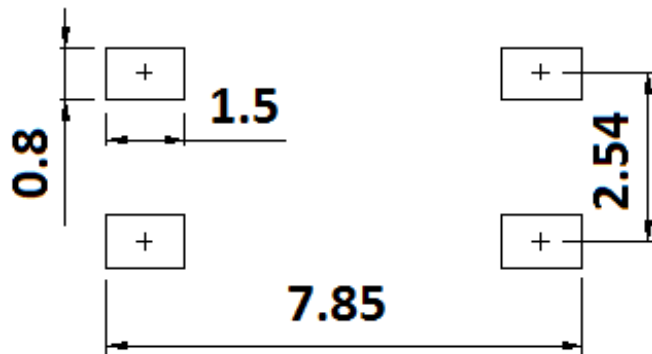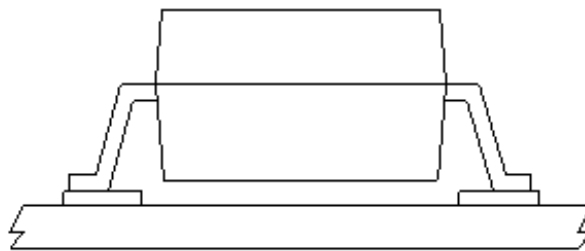
Unit：mm

● **4-pin SOP Carrier Tape & Reel**

Unit: mm

TLD

TRU

TOLERANCE : ±0.2mm

Direction of feed from reel

Direction of feed from reel
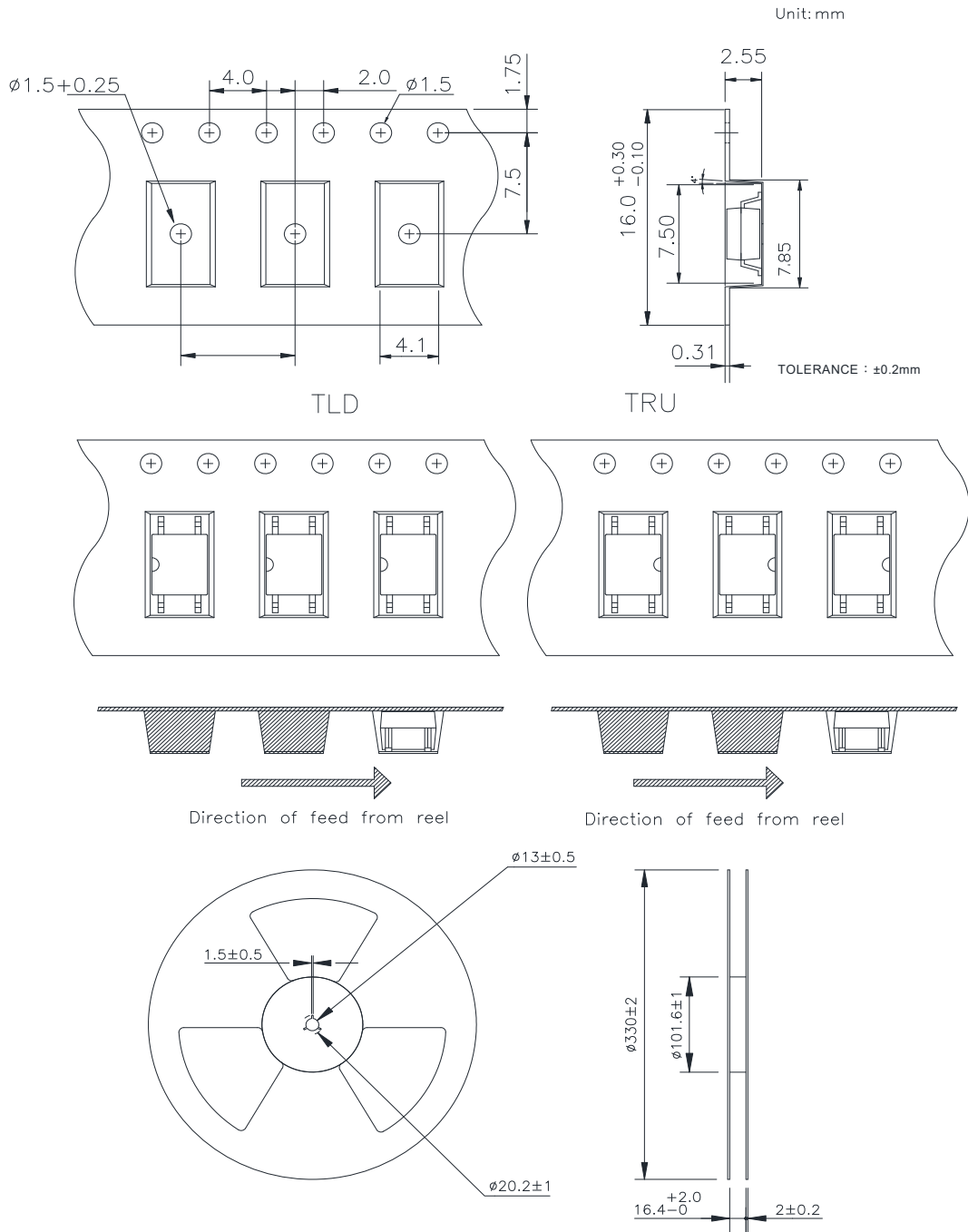
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