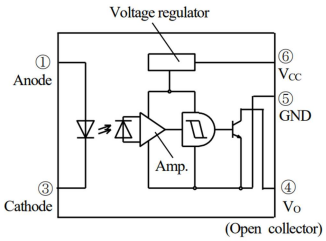
KPC400 Series

5Pin SOP Schmitt Trigger PHOTOCOUPLER

Description

The KPC400 series consist of an LED. It is a super high-speed digital output type photo coupler packaged in a 5pin mini-flat package.

Schematic



1. Anode
3. Cathode
4. Vo
5. GND
6. Vcc

Features

1. " Low " output during light emission
2. Isolation voltage between input and output (Viso: 3750V rms)
3. TTL and LSTTL compatible output

Applications

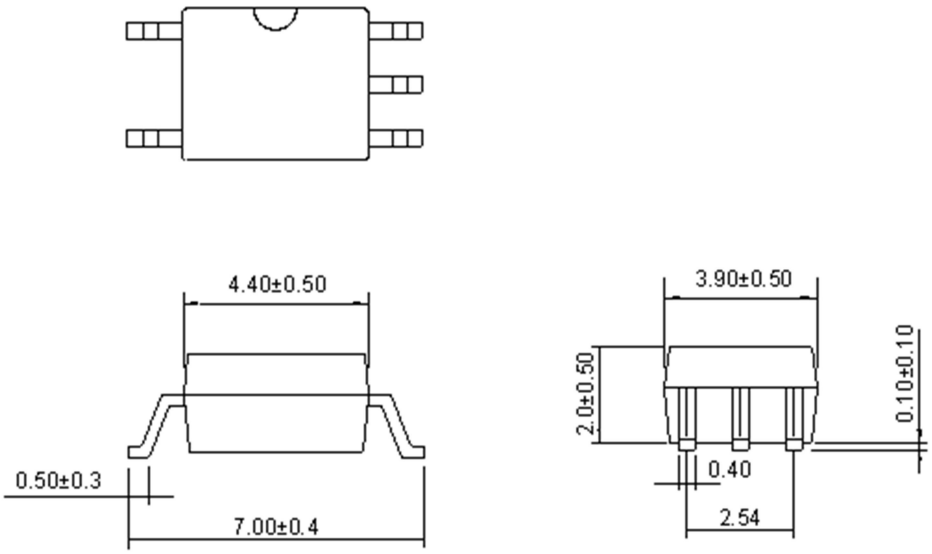
1. Hybrid substrate which requires high density mounting
2. Personal computers, office computers and peripheral equipment
3. Electronic musical instruments

Truth Table

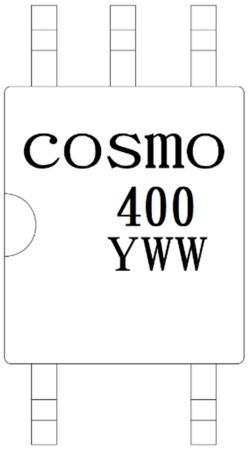
Input	Output
H	L
L	H

Outside Dimension

Unit : mm



Device Marking



Notes:

cosmo
400
YWW Y: Year code / WW: Week code

● Absolute Maximum Ratings

(Ta = 25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current [1]	I_F	50	mA
	Reverse voltage	V_R	6	V
	Power dissipation	P	70	mW
Output	Supply voltage	V_{CC}	16	V
	High level output voltage	V_{OH}	16	V
	Low level output current	I_{OL}	50	mA
	Collector power dissipation	P_O	130	mW
Total power dissipation		P_{tot}	150	mW
Isolation voltage [2]		$V_{iso(rms)}$	3750	V
Operating temperature		T_{opr}	-40 to +110	℃
Storage temperature		T_{stg}	-55 to +125	℃
Soldering temperature 10 seconds		T_{sol}	260	℃

Note
1 Ta=25°C
2 This device is considered as a two-terminal device: Pins 1 and 3 are shorted together, and pins 4, 5 and 6 are shorted together

● Recommended Operating Conditions

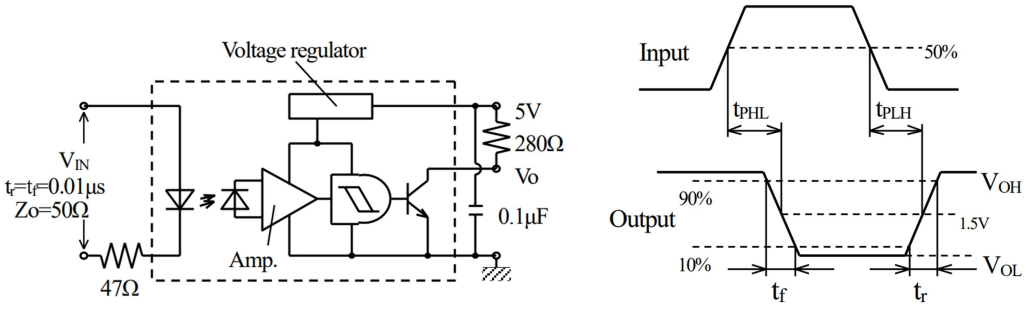
Parameter	Symbol	Min	Max	Unit
Operating supply voltage range	V_{CC}	3	15	V

● Electro-optical Characteristics

Ta = 0 to 70℃ unless otherwise specified

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input forward voltage	V_F	I_F=4mA	-	1.1	1.4	V
		I_F=0.3mA	0.7	1.0	-	V
Reverse current	I_R	V_R=3V	-	-	10	μA
Terminal capacitance	C_t	V_F=0, f=1KHz	-	30	250	pF
High level output current	I_{OH}	I_F=0,V_{CC}=V_O=15V	-	-	100	uA
Low level output voltage	V_{OL}	I_{OL}=16mA,V_{CC}=5V,I_F=4mA	-	0.2	0.4	V
Threshold input current(Output H→L)	I_{FHL}	V_{CC}=5V,R_L=280Ω,T_A=25℃	-	1.1	2.0	mA
		V_{CC}=5V,R_L=280Ω	-	-	4.0	mA
Threshold input current(Output L→H)	I_{FLH}	V_{CC}=5V,R_L=280Ω,T_A=25℃	0.4	0.8	-	mA
		V_{CC}=5V,R_L=280Ω	0.3	-	-	mA
Hysteresis	I_{FLH}/ I_{FHL}	V_{CC}=5V,R_L=280Ω	0.5	0.7	0.9	
High level supply current	I_{CCH}	I_F=0,V_{CC}=5V	-	1.0	5	mA
Low level supply current	I_{CCL}	I_F=4mA,V_{CC}=5V	-	2.5	5	mA
Isolation resistance (input-output)	R_{I-O}	V_{I-O}=500V,	5×10^{10}	10^{11}	-	Ω
Propagation delay time to high Output level	t_{PLH}	T_A=25℃,V_{CC}=5V,I_F=4mA,R_L=280Ω	-	1	3	us
Propagation delay time to low Output level	t_{PHL}		-	2	6	us
Output rise time	tr		-	0.1	0.5	us
Output fall time	tf		-	0.05	0.5	us

- **Test Circuit for Propagation Delay time**



Characteristics Curves

Fig.1.Forward Current V.S. Forward Voltage

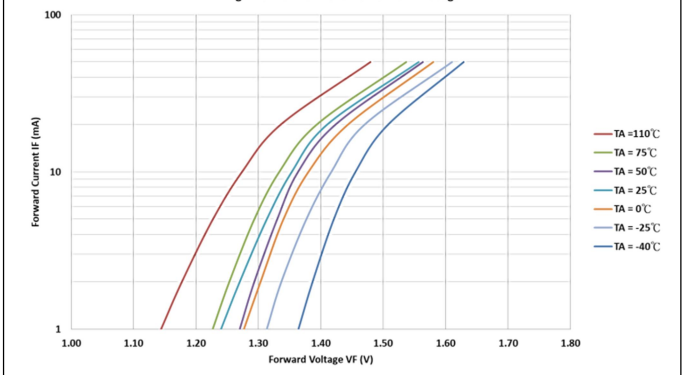


Fig.2.Threshold Input Current V.S. Supply Voltage

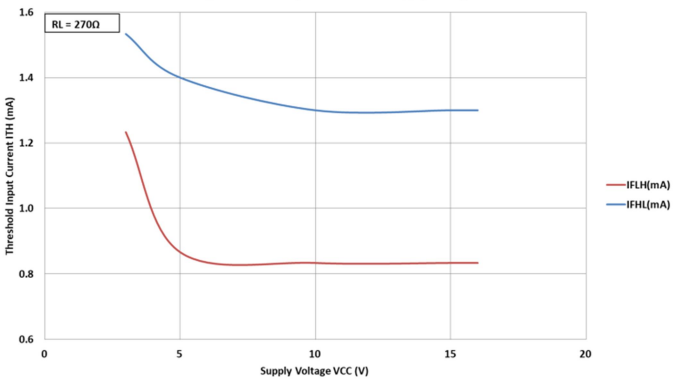


Fig.3.Threshold Input Current V.S. Ambient temperature

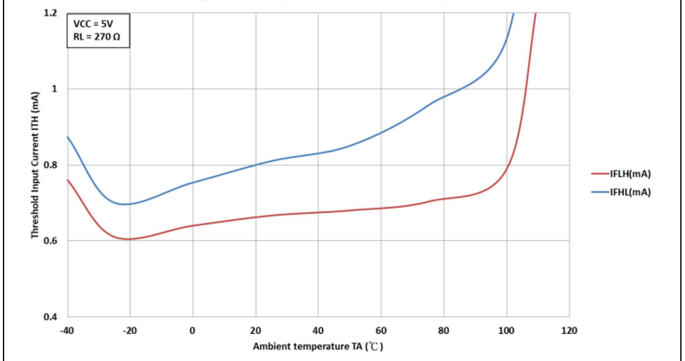


Fig.4.Low-Level Output Voltage V.S.Low-Level Output Current

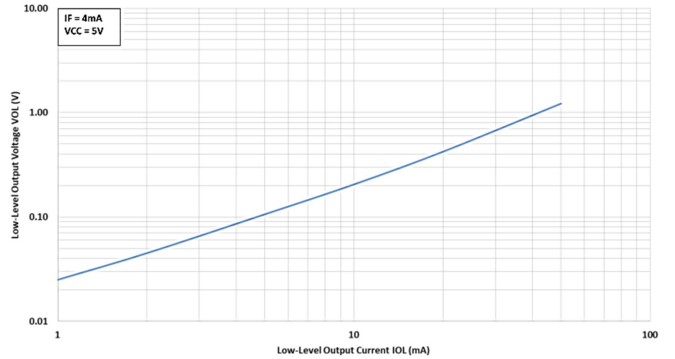


Fig.5.Low-Level Output Voltage V.S. Ambient temperature

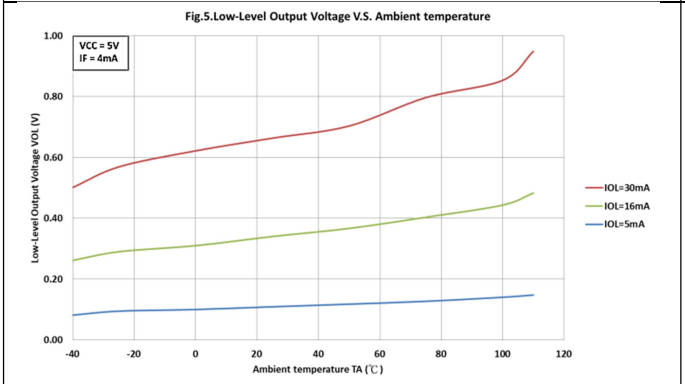


Fig.6.Supply Current V.S. Supply Voltage

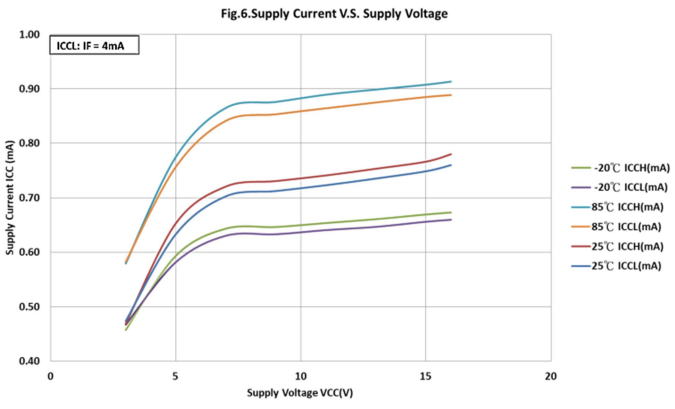


Fig.7.Propagation Delay Time V.S. Forward Current

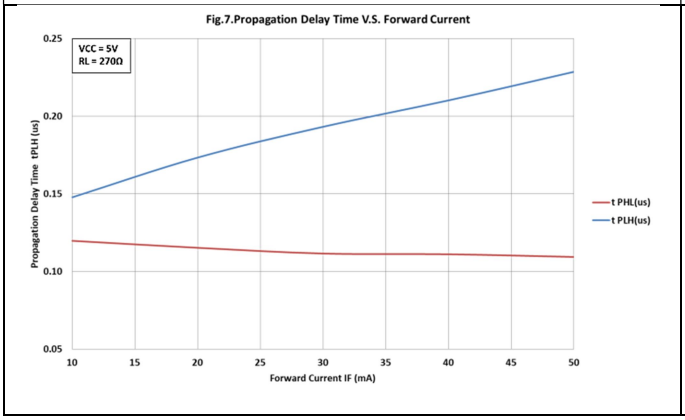
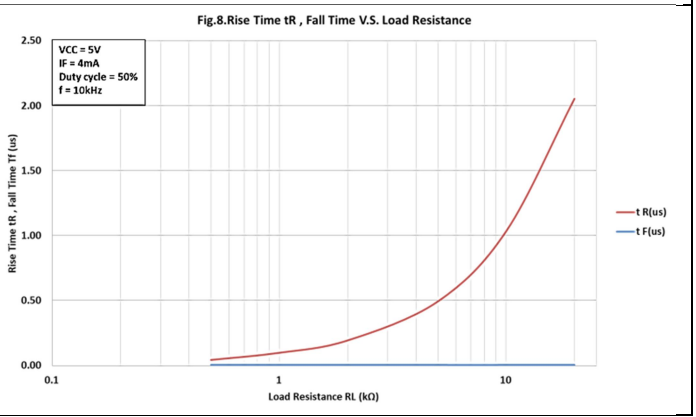


Fig.8.Rise Time tR , Fall Time V.S. Load Resistance

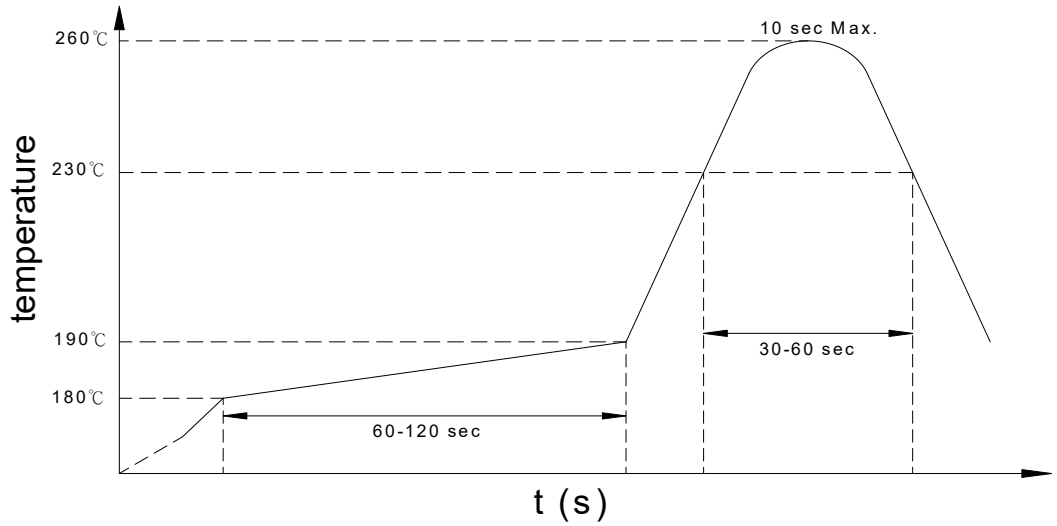


Recommended Soldering Conditions

(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**

KPC400 (Y)

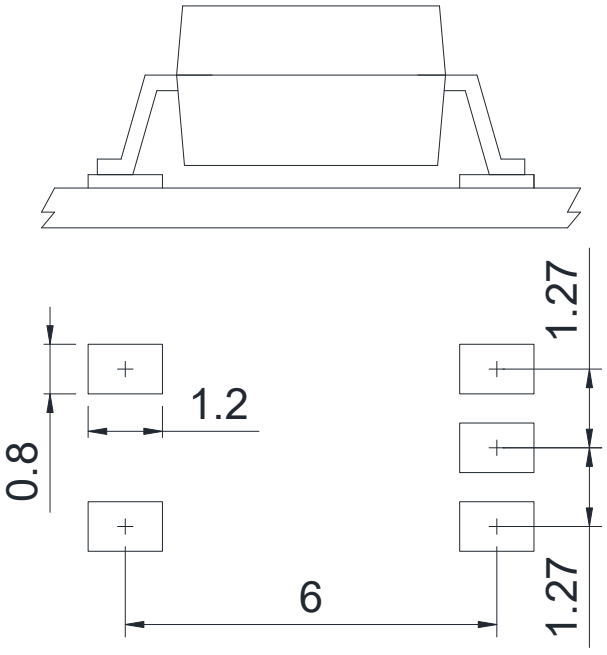
Notes:

KPC400 = Part No.

Y = Tape and reel option (TLD、TRU)

Option	Description	Packing quantity
(TLD)	surface mount type package + TL tape & reel option	3000 units per reel
(TRU)	surface mount type package + TR tape & reel option	3000 units per reel

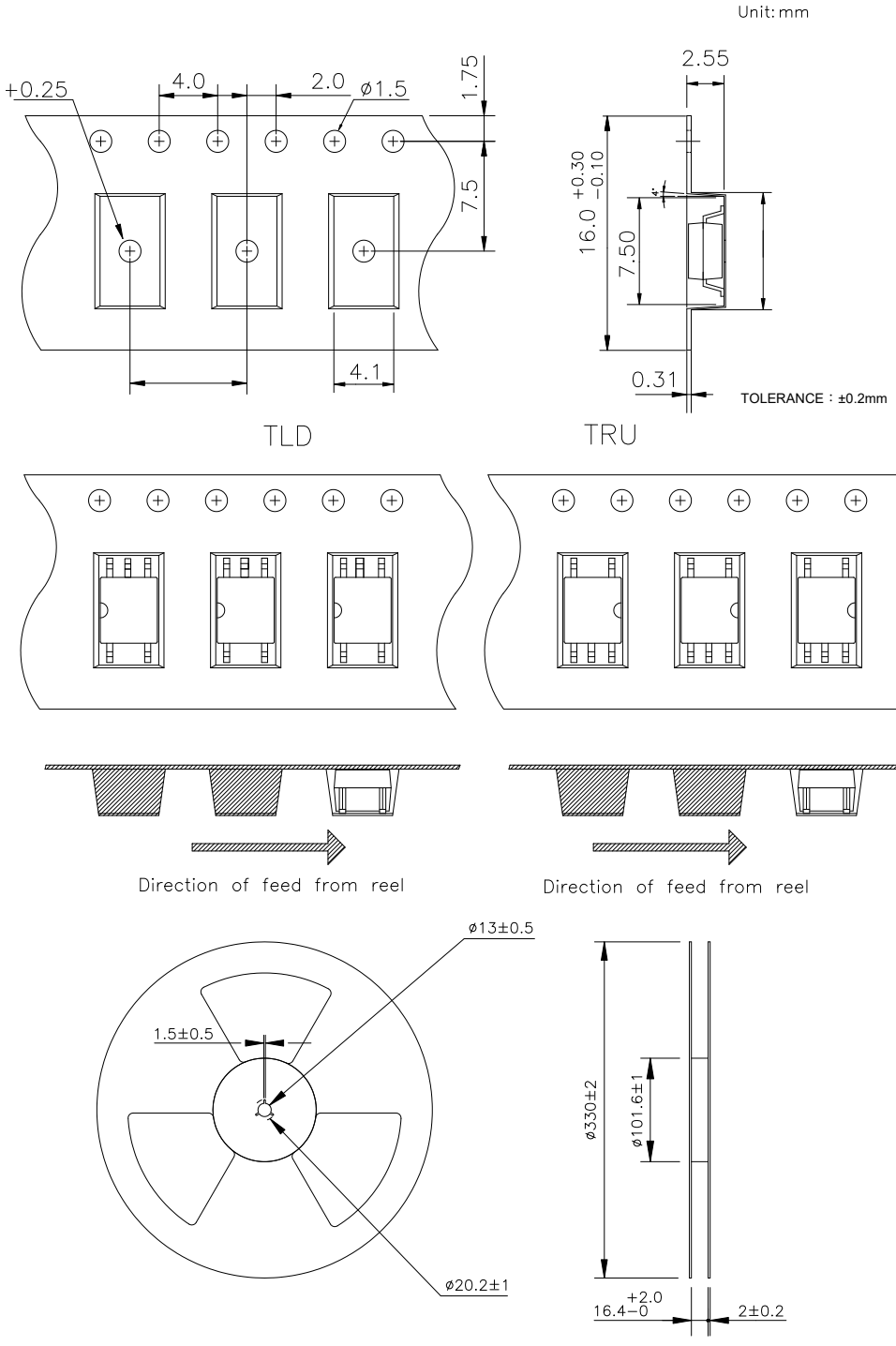
- **Recommended Pad Layout for Surface Mount Lead Form**



Unit :mm

● 8-pin SMD Carrier Tape & Reel

Unit: mm



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