

# PC400

## Compact, Surface Mount Type OPIC Photocoupler

### ■ Features

1. Mini-flat package
2. "Low" output during light emission
3. Isolation voltage between input and output  
( $V_{iso} : 3\,750V_{rms}$ )
4. TTL and LSTTL compatible output
5. Recognized by UL(No.E64380)

### ■ Applications

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

### ■ Package Specifications

Model No.	Package specifications	Diameter of reel	Tape width
PC400	Taping package (Net: 3 000pcs. )	φ 370mm	12mm
PC400T	Taping package (Net: 750pcs. )	φ 178mm	12mm
PC400Z	Sleeve package (Net: 100pcs. )	-	-

### ■ Absolute Maximum Ratings

( $T_a = 25^\circ\text{C}$ )

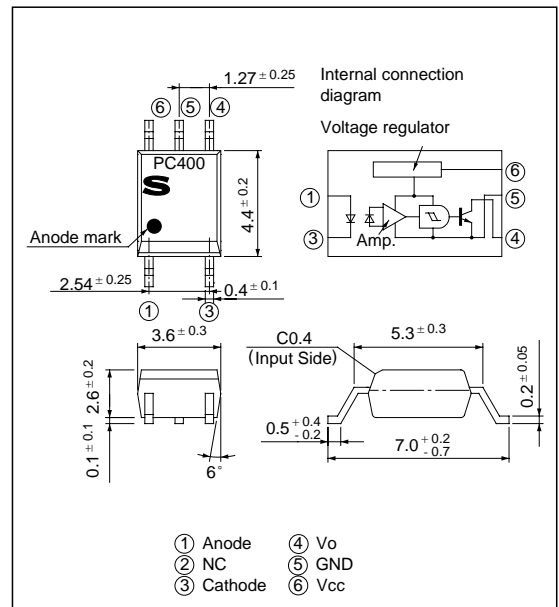
Parameter		Symbol	Rating	Unit
Input	Forward current	$I_F$	50	mA
	Reverse voltage	$V_R$	6	V
	Power dissipation	P	70	mW
Output	Supply voltage	$V_{CC}$	16	V
	High level output voltage	$V_{OH}$	16	V
	Low level output current	$I_{OL}$	50	mA
	Power dissipation	$P_O$	130	mW
	Total power dissipation	$P_{tot}$	150	mW
	*1 Isolation voltage	$V_{iso}$	3 750	$V_{rms}$
Operating temperature		$T_{opr}$	- 25 to + 85	$^\circ\text{C}$
Storage temperature		$T_{stg}$	- 40 to + 125	$^\circ\text{C}$
*2 Soldering temperature		$T_{sol}$	260	$^\circ\text{C}$

\*1 AC for 1 minute, 40 to 60% RH

\*2 For 10 seconds

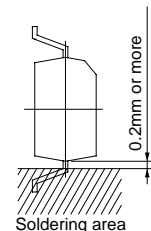
### ■ Outline Dimensions

(Unit : mm)



\* "OPIC" (Optical IC) is a trademark of the SHARP Corporation.

An OPIC consists of a light-detecting element and signal-processing circuit integrated onto a single chip.



## ■ Electro-optical Characteristics

( $T_a = 0$  to  $+70^\circ\text{C}$  unless otherwise specified)

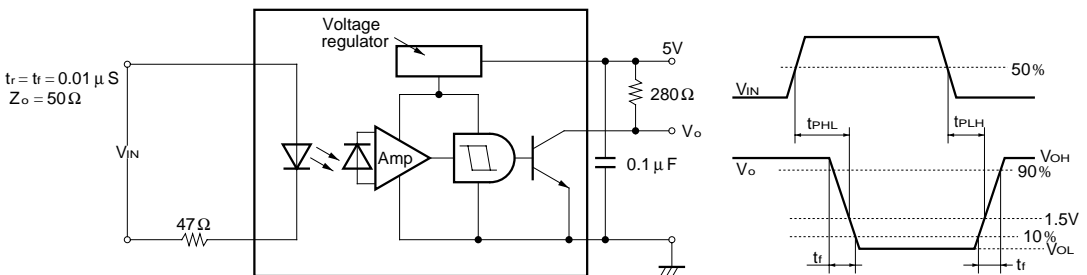
Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit							
Input	Forward voltage	$V_F$	$I_F = 4\text{mA}$ $I_F = 0.3\text{mA}$	- 0.7	1.1 1.0	1.4 -	V							
	Reverse current	$I_R$	$T_a = 25^\circ\text{C}, V_R = 3\text{V}$	-	-	10	$\mu\text{A}$							
	Terminal capacitance	$C_t$	$T_a = 25^\circ\text{C}, V = 0$ $f = 1\text{kHz}$	-	30	250	pF							
Output	Operating supply voltage	$V_{CC}$		3	-	15	V							
	Low level output voltage	$V_{OL}$	$I_{OL} = 16\text{mA}, V_{CC} = 5\text{V}$ $I_F = 4\text{mA}$	-	0.2	0.4	V							
	High level output current	$I_{OH}$	$V_{CC} = V_O = 15\text{V}, I_F = 0$	-	-	100	$\mu\text{A}$							
	Low level supply current	$I_{CCL}$	$V_{CC} = 5\text{V}, I_F = 4\text{mA}$	-	2.5	5.0	mA							
	High level supply current	$I_{CCH}$	$V_{CC} = 5\text{V}, I_F = 0$	-	1.0	5.0	mA							
Transfer characteristics	*3 "H→L" threshold input current	$I_{FHL}$	$T_a = 25^\circ\text{C}, V_{CC} = 5\text{V}$ $R_L = 280\Omega$	-	1.1	2.0	mA							
			$V_{CC} = 5\text{V}, R_L = 280\Omega$	-	-	4.0								
	*4 "L→H" threshold input current	$I_{FLH}$	$T_a = 25^\circ\text{C}, V_{CC} = 5\text{V}$ $R_L = 280\Omega$	0.4	0.8	-	mA							
			$V_{CC} = 5\text{V}, R_L = 280\Omega$	0.3	-	-								
	*5 Hysteresis	$I_{FLH} / I_{FHL}$	$V_{CC} = 5\text{V}, R_L = 280\Omega$	0.5	0.7	0.9								
	*6 Response time	Isolation resistance	$R_{ISO}$	$T_a = 25^\circ\text{C}, \text{DC}500\text{V}$ 40 to 60% RH	$5 \times 10^{10}$	$10^{11}$	-	$\Omega$						
"H→L" propagation delay time									$t_{PHL}$	$T_a = 25^\circ\text{C}$	-	1	3	$\mu\text{s}$
"L→H" propagation delay time									$t_{PLH}$		-	2	6	
Fall time									$t_f$		-	0.05	0.5	
Rise time	$t_r$	-	0.1	0.5										

\*3  $I_{FHL}$  represents forward current when output goes from high to low.

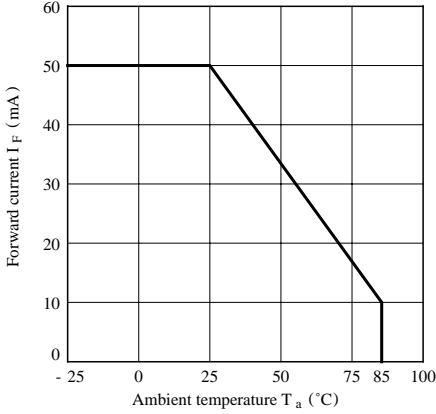
\*4  $I_{FLH}$  represents forward current when output goes from low to high.

\*5 Hysteresis stands for  $I_{FLH} / I_{FHL}$ .

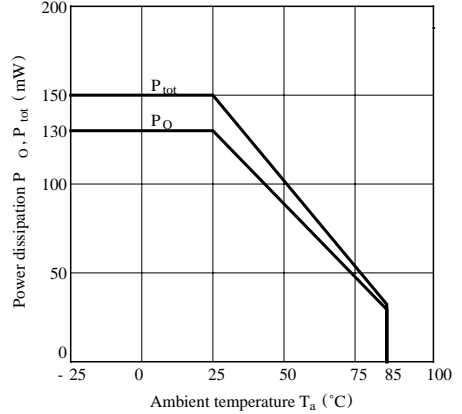
\*6 Test circuit for response time is shown below.



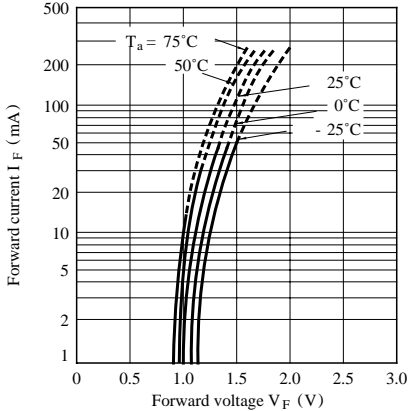
**Fig. 1 Forward Current vs. Ambient Temperature**



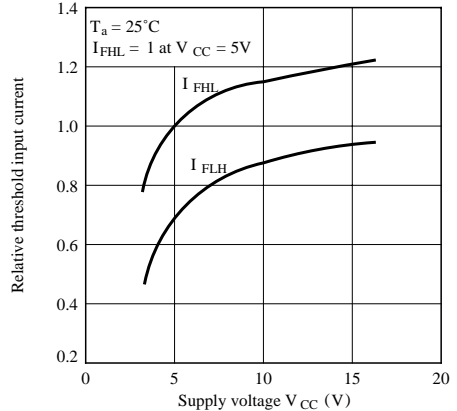
**Fig. 2 Power Dissipation vs. Ambient Temperature**



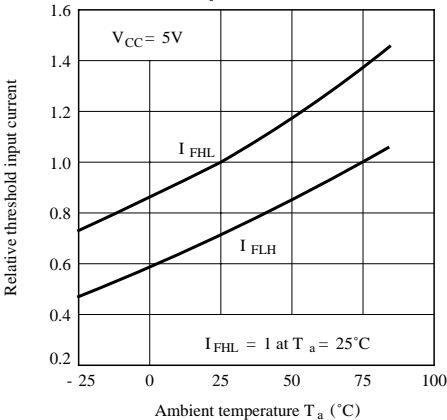
**Fig. 3 Forward Current vs. Forward Voltage**



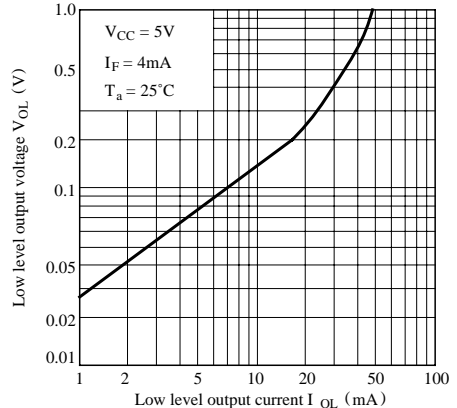
**Fig. 4 Relative Threshold Input Current vs. Supply Voltage**



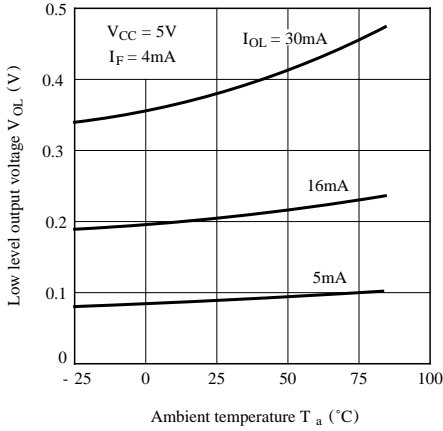
**Fig. 5 Relative Threshold Input Current vs. Ambient Temperature**



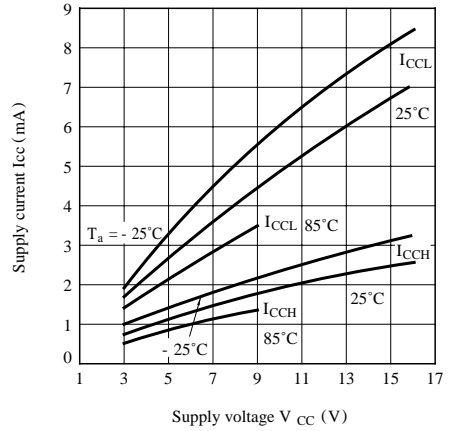
**Fig. 6 Low Level Output Voltage vs. Low Level Output Current**



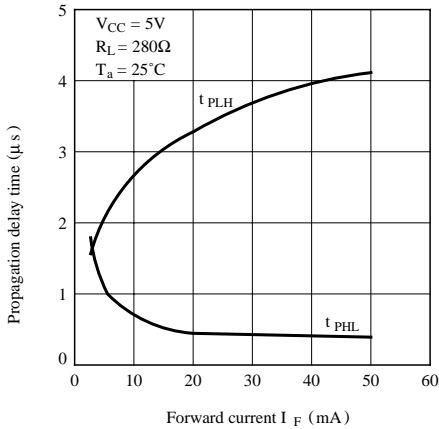
**Fig. 7 Low Level Output Voltage vs. Ambient Temperature**



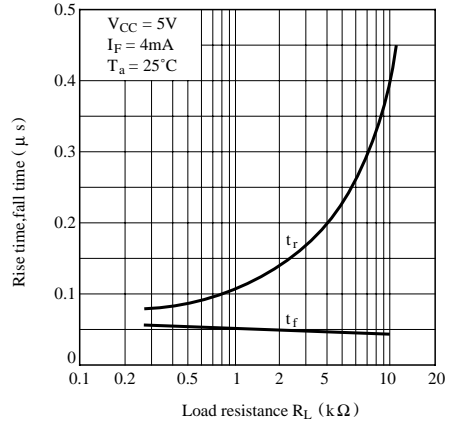
**Fig. 8 Supply Current vs. Supply Voltage**



**Fig. 9 Propagation Delay Time vs. Forward Current**



**Fig.10 Rise Time, Fall Time vs. Load Resistance**



**■ Preactions for Use**

- (1) It is recommended that a by-pass capacitor of more than 0.01  $\mu F$  be added between  $V_{CC}$  and GND near the device in order to stabilize power supply line.
- (2) Handle this product the same as with other integrated circuits against static electricity.
- (3) As for other general cautions, refer to the chapter "Precautions for Use"

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