

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

(Ta = 25°C)

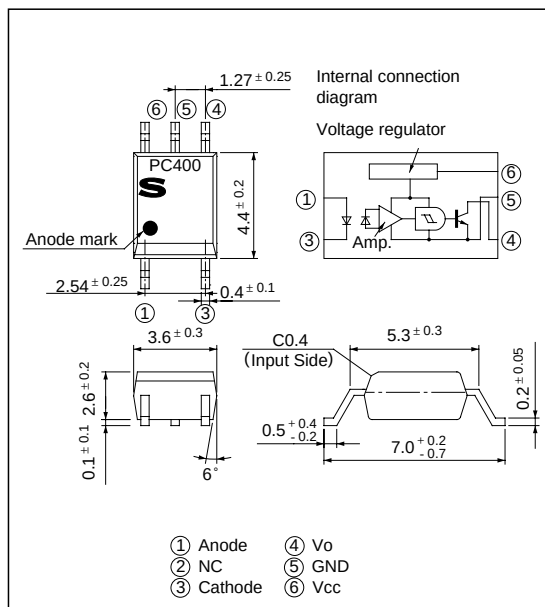
Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	50	mA
	Reverse voltage	V_R	6	V
	Power dissipation	P	70	mW
Output	Supply voltage	V_{CC}	16	V
	High level output voltage	V_{OH}	16	V
	Low level output current	I_{OL}	50	mA
	Power dissipation	P_O	130	mW
	Total power dissipation	P_{tot}	150	mW
*1 Isolation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

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

*2 For 10 seconds

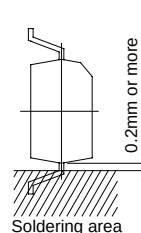
■ Outline Dimensions

(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

(Ta = 0 to + 70°C 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	-	
	Reverse current	I _R	Ta = 25°C, V _R = 3V	-	-	10	μA
	Terminal capacitance	C _t	Ta = 25°C, V = 0 f = 1kHz	-	30	250	pF
Output	Operating supply voltage	V _{CC}		3	-	15	V
	Low level output voltage	V _{OL}	I _{OL} = 16mA, V _{CC} = 5V I _F = 4mA	-	0.2	0.4	V
	High level output current	I _{OH}	V _{CC} = V _O = 15V, I _F = 0	-	-	100	μA
	Low level supply current	I _{CCL}	V _{CC} = 5V, I _F = 4mA	-	2.5	5.0	mA
	High level supply current	I _{CCH}	V _{CC} = 5V, I _F = 0	-	1.0	5.0	mA
Transfer characteristics	*3 “H→L” threshold input current	I _{FHL}	Ta = 25°C, V _{CC} = 5V R _L = 280Ω	-	1.1	2.0	mA
			V _{CC} = 5V, R _L = 280Ω	-	-	4.0	
	*4 “L→H” threshold input current	I _{FLH}	Ta = 25°C, V _{CC} = 5V R _L = 280Ω	0.4	0.8	-	mA
			V _{CC} = 5V, R _L = 280Ω	0.3	-	-	
	*5 Hysteresis	I _{FLH} / I _{FHL}	V _{CC} = 5V, R _L = 280Ω	0.5	0.7	0.9	
	Isolation resistance	R _{ISO}	Ta = 25°C, DC500V 40 to 60% RH	5 x 10 ¹⁰	10 ¹¹	-	Ω
	*6 Response time	“H→L” propagation delay time	Ta = 25°C V _{CC} = 5V, I _F = 4 mA R _L = 280Ω	-	1	3	μs
		“L→H” propagation delay time		-	2	6	
		Fall time		-	0.05	0.5	
		Rise time		-	0.1	0.5	

*3 I_{FHL} represents forward current when output gose 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.

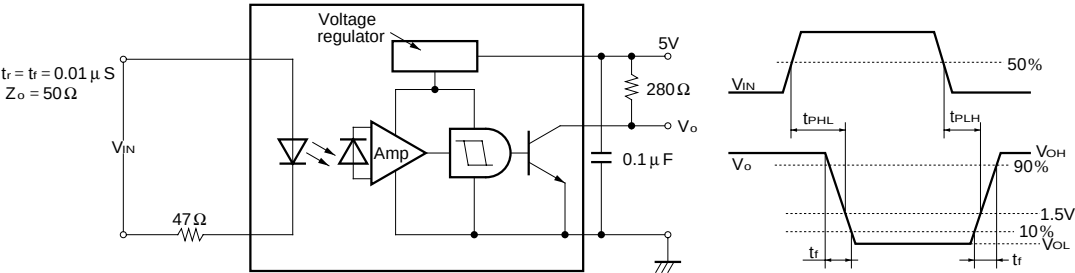


Fig. 1 Forward Current vs. Ambient Temperature

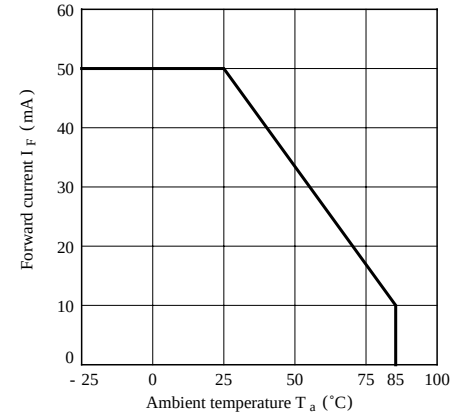


Fig. 2 Power Dissipation vs. Ambient Temperature

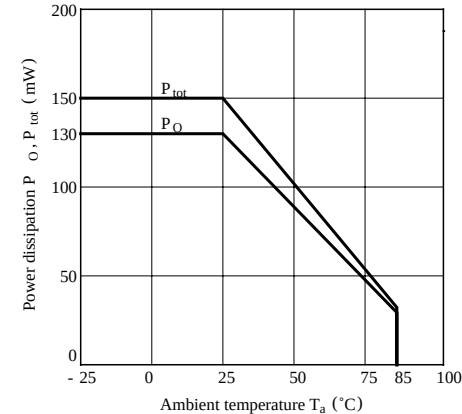


Fig. 3 Forward Current vs. Forward Voltage

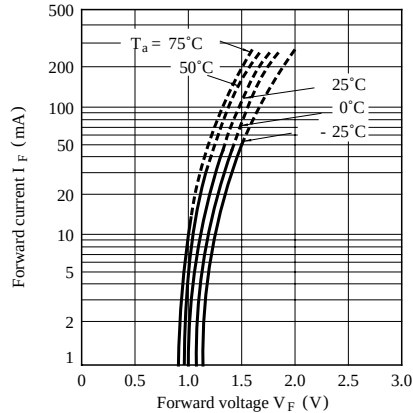


Fig. 4 Relative Threshold Input Current vs. Supply Voltage

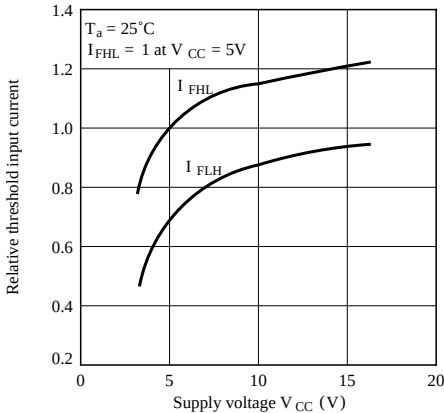


Fig. 5 Relative Threshold Input Current vs. Ambient Temperature

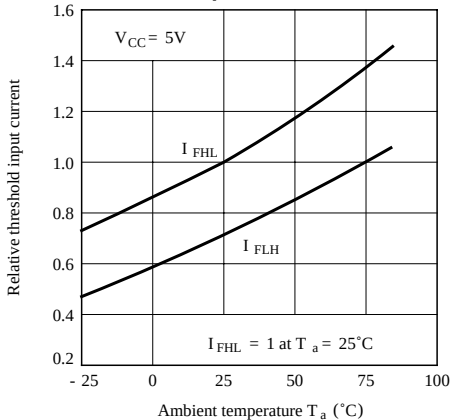


Fig. 6 Low Level Output Voltage vs. Low Level Output Current

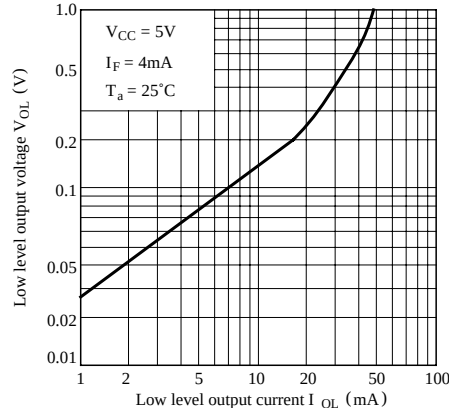


Fig. 7 Low Level Output Voltage vs. Ambient Temperature

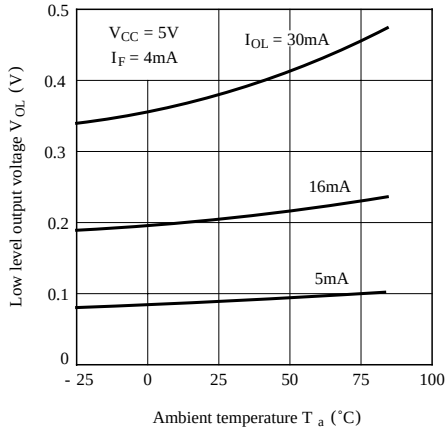


Fig. 8 Supply Current vs. Supply Voltage

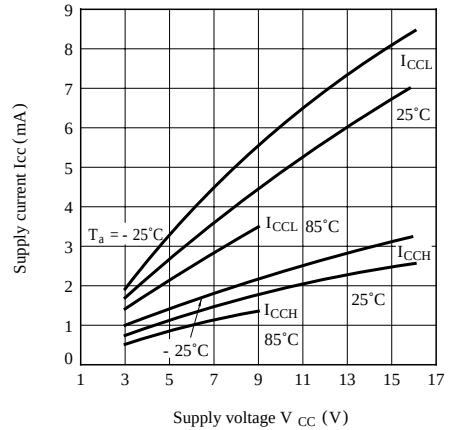


Fig. 9 Propagation Delay Time vs. Forward Current

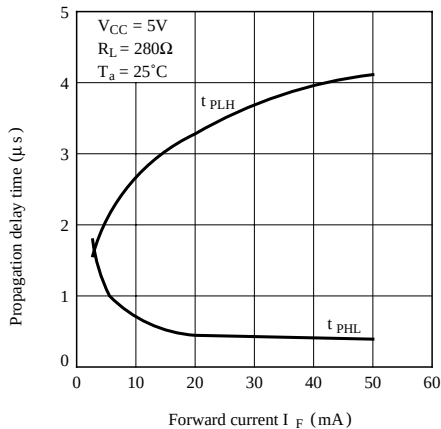
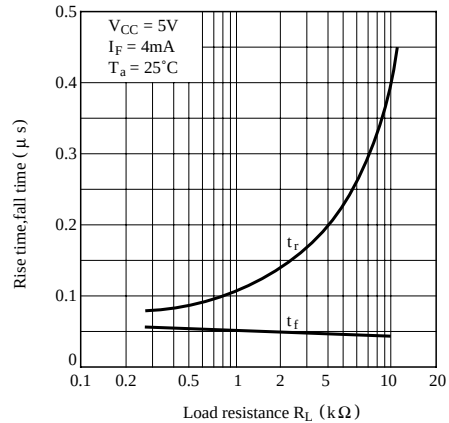


Fig.10 Rise Time, Fall Time vs. Load Resistance



■ Precautions for Use

- (1) It is recommended that a by-pass capacitor of more than $0.01\text{ }\mu\text{F}$ 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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 - Traffic signals
 - Gas leakage sensor breakers
 - Alarm equipment
 - Various safety devices, etc.
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