

加急出货

# PC401

## Compact, Surface Mount Type OPIC Photocoupler

### ■ Features

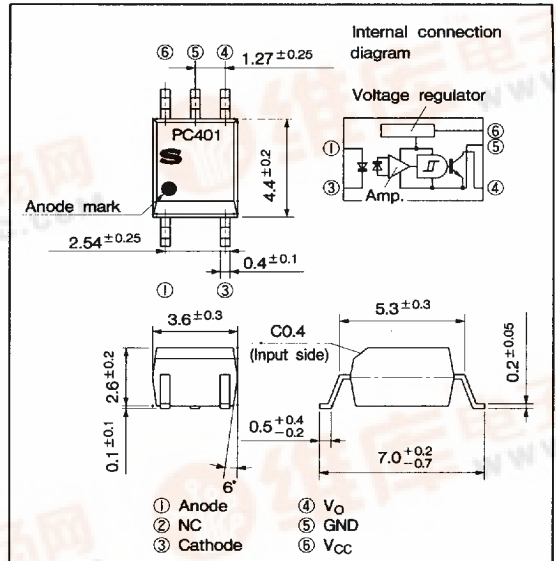
1. Opaque, mini-flat package
2. "High" output during light emission
3. Isolation voltage between input and output ( $V_{iso} : 3\ 750V_{rms}$ )
4. TTL and LSTTL compatible output
5. Recognized by UL, file No.64380

### ■ Applications

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

### ■ Outline Dimensions

(Unit : mm)



### ■ Package Specifications

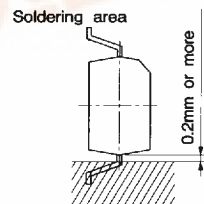
Model No.	Package specifications	Diameter of reel	Tape width
PC401	Taping package (Net : 3 000pcs.)	$\phi 370\text{mm}$	12mm
PC401T	Taping package (Net : 750pcs.)	$\phi 178\text{mm}$	12mm
PC401Z	Sleeve package (Net : 100pcs.)	—	—

\* "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.

### ■ 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 10 seconds

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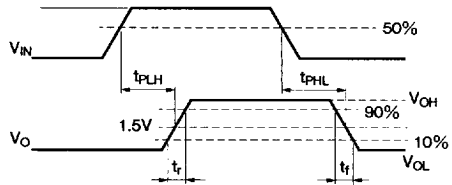
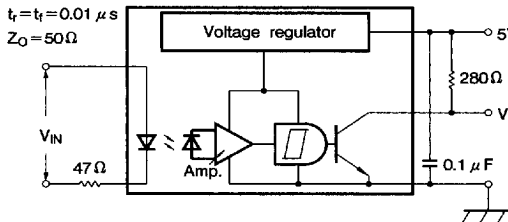
In the absence of confirmation by device specification sheets, SHARP takes no responsibility for any defects that occur in equipment using any of SHARP's devices, shown in catalogs, data books, etc. Contact SHARP in order to obtain the latest version of the device specification sheets before using any SHARP's device.

■ **Electro-optical Characteristics** (Ta=0 to +70°C unless otherwise specified.)

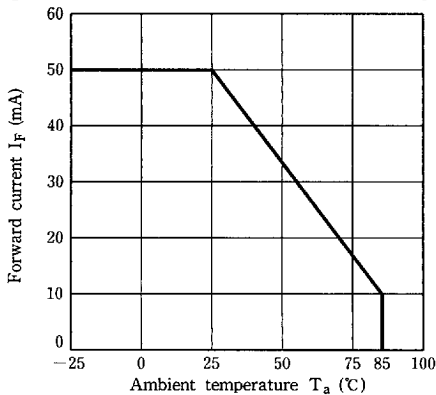
Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit	
Input	Forward voltage	V <sub>F</sub>	I <sub>F</sub> = 4mA	—	1.1	1.4	V	
			I <sub>F</sub> = 0.3mA	0.7	1.0	—		
	Reverse current	I <sub>R</sub>	Ta = 25°C, V <sub>R</sub> = 3V	—	—	10	μA	
Terminal capacitance		C <sub>t</sub>	Ta = 25°C, V = 0, f = 1kHz	—	30	250	pF	
Operating supply voltage		V <sub>CC</sub>		3	—	15	V	
Output	Low level output voltage	V <sub>OL</sub>	I <sub>F</sub> = 0, V <sub>CC</sub> = 5V, I <sub>OL</sub> = 16mA	—	0.2	0.4	V	
	High level output current	I <sub>OH</sub>	I <sub>F</sub> = 4mA, V <sub>CC</sub> = V <sub>O</sub> = 15V	—	—	100	μA	
	Low level supply current	I <sub>CCL</sub>	I <sub>F</sub> = 0, V <sub>CC</sub> = 5V	—	2.5	5.0	mA	
	High level supply current	I <sub>CCH</sub>	I <sub>F</sub> = 4mA, V <sub>CC</sub> = 5V	—	2.7	5.5	mA	
Transfer characteristics	*3 "H→L" threshold input current	I <sub>FHL</sub>	Ta = 25°C, V <sub>CC</sub> = 5V, R <sub>L</sub> = 280Ω	0.4	0.8	—	mA	
			V <sub>CC</sub> = 5V, R <sub>L</sub> = 280Ω	0.3	—	—		
	*4 "H→L" threshold input current	I <sub>FLH</sub>	Ta = 25°C, V <sub>CC</sub> = 5V, R <sub>L</sub> = 280Ω	—	1.1	2.0	mA	
			V <sub>CC</sub> = 5V, R <sub>L</sub> = 280Ω	—	—	4.0		
	*5 Hysteresis		I <sub>FHL</sub> /I <sub>FLH</sub>	V <sub>CC</sub> = 5V, R <sub>L</sub> = 280Ω	0.5	0.7	0.9	
	*6 Isolation resistance		R <sub>ISO</sub>	Ta = 25°C, DC500V, 40 to 60%RH	5 × 10 <sup>10</sup>	10 <sup>11</sup>	—	Ω
*Response time	"H→L" propagation delay time	t <sub>PHL</sub>	Ta = 25°C, V <sub>CC</sub> = 5V R <sub>L</sub> = 280Ω, I <sub>F</sub> = 4mA	—	2	6	μs	
	"L→H" propagation delay time	t <sub>PLH</sub>		—	1	3		
	Fall time	t <sub>r</sub>		—	0.05	0.5		
	Rise time	t <sub>r</sub>		—	0.1	0.5		

- \*3 I<sub>FHL</sub> represents forward current when output goes from high to low.
- \*4 I<sub>FLH</sub> represents forward current when output goes from low to high.
- \*5 Hysteresis stands for I<sub>FHL</sub>/I<sub>FLH</sub>.
- \*6 Test circuit for response time is shown below.

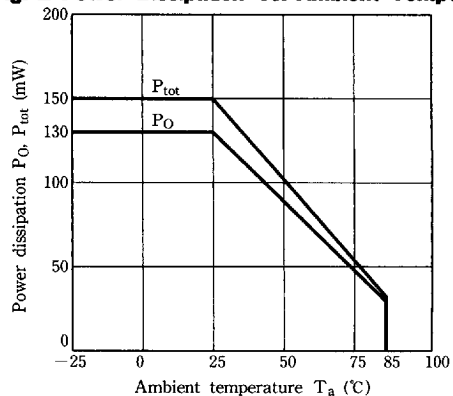
**Test Circuit for Response Time**



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

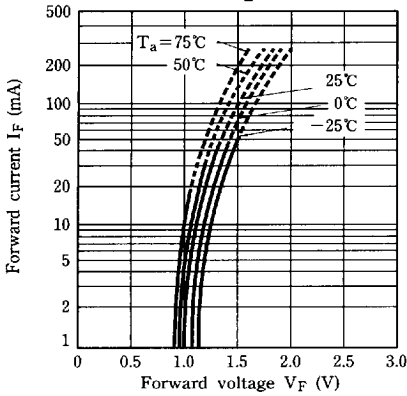


**Fig. 2 Power Dissipation vs. Ambient Temperature**

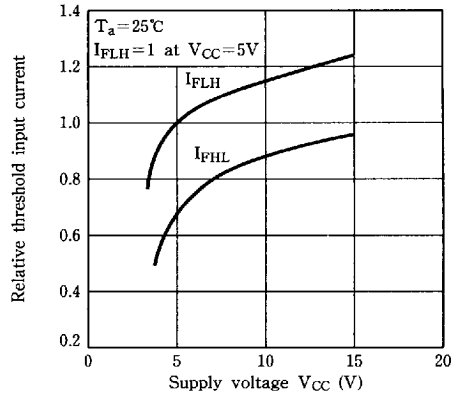


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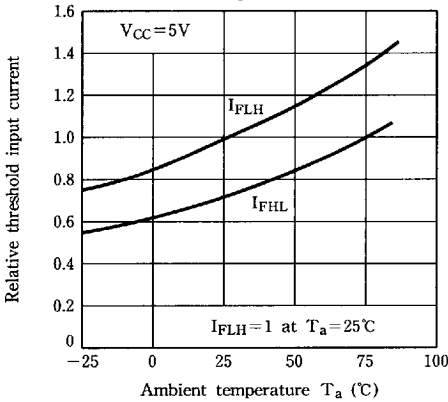
**Fig. 3 Forward Current vs. Forward Voltage**



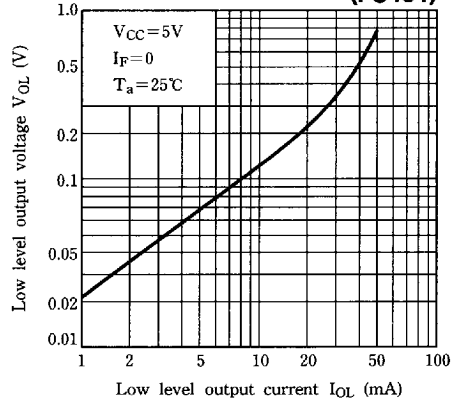
**Fig. 4 Relative Threshold Input Current vs. Supply Voltage**



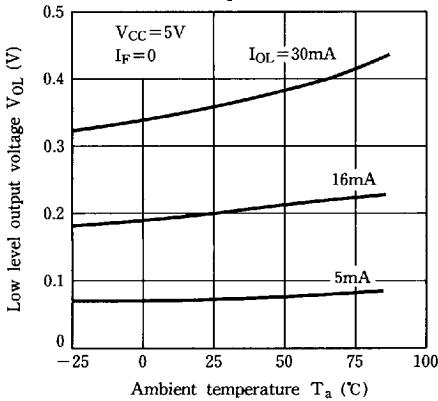
**Fig. 5 Relative Threshold Input Current vs. Ambient Temperature**



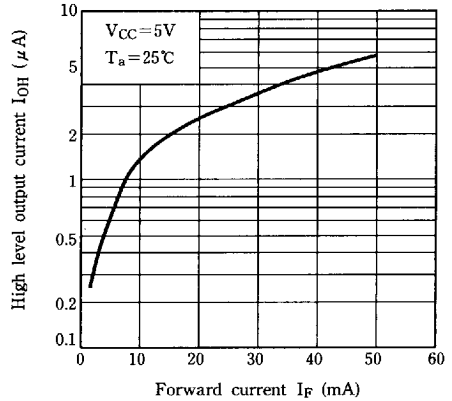
**Fig. 6 Low Level Output Voltage vs. Low Level Output Current (PC401)**



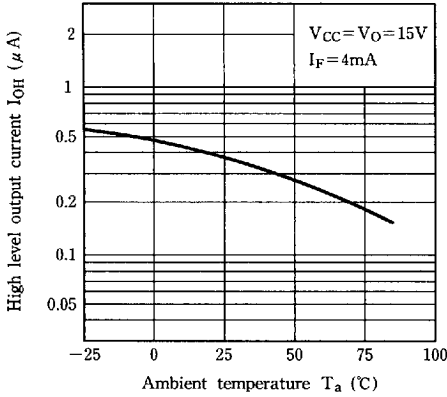
**Fig. 7 Low Level Output Voltage vs. Ambient Temperature**



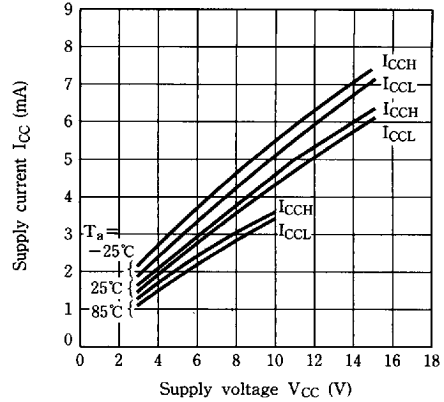
**Fig. 8 High Level Output Current vs. Forward Current**



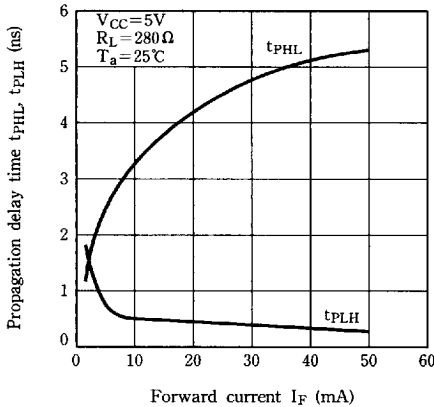
**Fig. 9 High Level Output Current vs. Ambient Temperature**



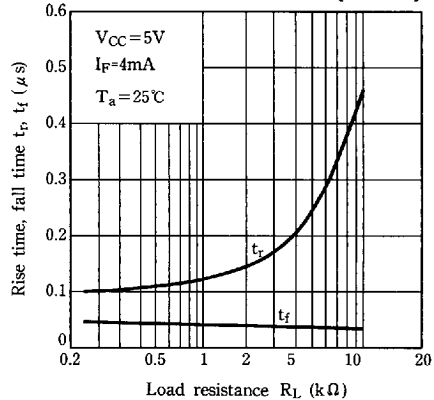
**Fig.10 Supply Current vs. Supply Voltage**



**Fig.11 Propagation Delay Time vs. Forward Current**



**Fig.12 Rise Time, Fall Time vs. Load Resistance (PC401)**



**■ Preactions for Use**

- (1) It is recommended that a by-pass capacitor of more than  $0.01 \mu F$  is 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" (Page 78 to 93).