PC41 O

Compact, Surface Mount **Ultra-high** Speed Response **OPIC Photocoupler**

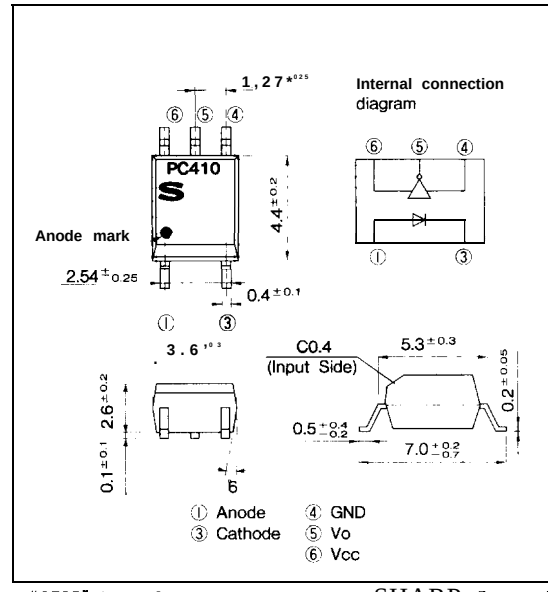
■ Features

1. Opaque, mini-flat package
2. Ultra-high speed response
   (t_{PLH}, t_{PHL} : TYP. 50ns at $R_L = 350\Omega$)
3. Isolation voltage between input and output
   (V_{iso} : 2500 V_{rms})
4. Instantaneous common mode rejection voltage CM_H : TYP. 500V/μs
5. Recognized by UL, file N0.64380

■ **Applications**

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

■ **Outline Dimensions** (Unit : mm)



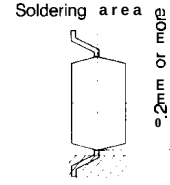
*"OPIC" (optical IC) is a trademark of the SHARP Corporation. An OPIC consists of a light-detecting element and signal processing circuit integrated onto a single chip.

■ Package **Specifications**

Model No.	Package specifications	ameter of ree Tape	width
PC410	Taping package(Net:3 000 pcs.)	ϕ370mm	12mm
PC41OT	Taping package(Net: 750pcs.)	4178mm	12mm
PC41 Oz	Sleeve package(Net: 10 0pcs.)		

■ Absolute Maximum **Ratings** (Ta = 25℃)

Parameter		Symbol	Rating	Unit
Input	*1 Fonvard cm-rent	I_F	20	mA
	Reverse voltage	V_R	5	V
	Power dissipation	P	40	mW
output	*'Supply voltage	V_{CC}	7	V
	High level output voltege	V_{OH}	7	V
	Low level output current	I_{OL}	50	mA
	Output collector power dissipation	P_O	85	mW
*3Isolation voltege		V_{iso}	2500	V_{rms}
Operating temperature		T_{opr}	0 to +70	℃
Storage temperature		T_{stg}	−40 to +125	℃
*4 Soldering temperature		T_{sol}	260	℃



*1 Ta = 0 to +70℃
*2 For 1 minute MAX,
*3 AC for 1 minute, 40 to 60% RH. Apply the specified voltage between the whole of the electrode pins on the input side and the whole of the electrode pins on the output side.
*4 For 10 seconds.

■ Electro-optical Characteristics

(Ta = O to + 70"C unless otherwise specified)

	Parameter		Symbol	Conditions		MIN.	TYP.	MAX.	Unit
Input	Forward voltage		V_F	Ta = 25℃, I_F = 10mA		–	1.6	1 9	V
	Reverse current		I_R	Ta = 25℃, V_R = 5V		–		10	μA
	Terminal capacitance		C_t	Ta = 25℃, V=O, f = 1MHz		–	60	150	pF
output	Low level output voltage		V_{OL}	I_{OL} = 13mA, V_{CC} = 5.5V, I_F = 5mA		–		0.6	v
	High level output current		IOH	V_{CC} = V_O = 5.5V, I_F = 250/μA		–	2	250	μA
	Low level supply current		I_{CCL}	V_{CC} = 5.5V, I_F = 10mA		–	13	18	mA
	High level supply current		I_{CCH}	V_{CC} = 5.5V, IF=O		–	7	15	mA
	"H→L" threshold input current		IFHL	V_{CC} = 5V, V_O = 0.8V, R_L = 350Ω		–	2,5	5	mA
	solation resistance		R_{ISO}	Ta=25℃, DC500V, 40 to 60% RH		5×10^{10}	10^{11}		Ω
	Floating capacitance		C_f	Ta = 25℃. V=O. f = 1MHz		-	0.6	5	DF
Transfer characteristics	Response time	"H→L" propagation delay time	t_{PHL}	Ta = 25℃		–	50	120	ns
		"L→H" propagation delay time	t_{PLH}	V_{CC} = 5V, I_F = 7.5mA		–	50	120	
		Fall time	t_f	R_L = 350Ω, C_L = 15pF		–	30	60	
		Rise time	t_r	Fig. 1		–	30	fin	
	CMR	Instantaneous common mode rejection voltage "High level output "	CMH	I_F = 0, V_O(MIN.) = 2V	Ta = 25℃, V_{CC} = 5V, V_{CM} = 10V(Peak), R_L = 350Ω, Fig. 2	100	500	–	V/μs
		Instantaneous common mode rejection voltage "Low level	CM_L	I_F = 5mA, V_O(MAX.) = 0.8V		-100	-500	–	

Note) All typical values : at Ta = 25-C, V_{CC} =5V
Each characteristics shall be measured under opaque condition.

■ Recommended Operation Conditions

Parameter	Symbol	MIN.	MAX.	Unit
Low level input current	I_{FL}	0	250	μA
High level input current	I_{FH}	7	15	mA
Supply voltage	V_{CC}	4.5	5.5	V
Fanout (TTL load)	N	–	8	–
Operating temperature	T_{opr}	0	70	℃

Connect a by-pass ceramic capacitor (0.01 to 0.1 μF) between V_{CC} and GND at the position witbin 1cm from lead pin.

Fig. 1 Test Circuit for t_{PHL}, t_{PLH}, t_r and t_f

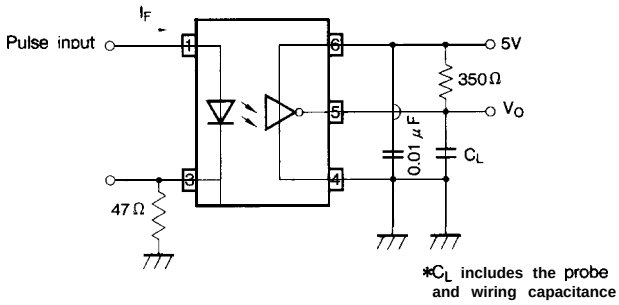


Fig. 2 Test Circuit for Instantaeus Common Mode Rejection Voltage

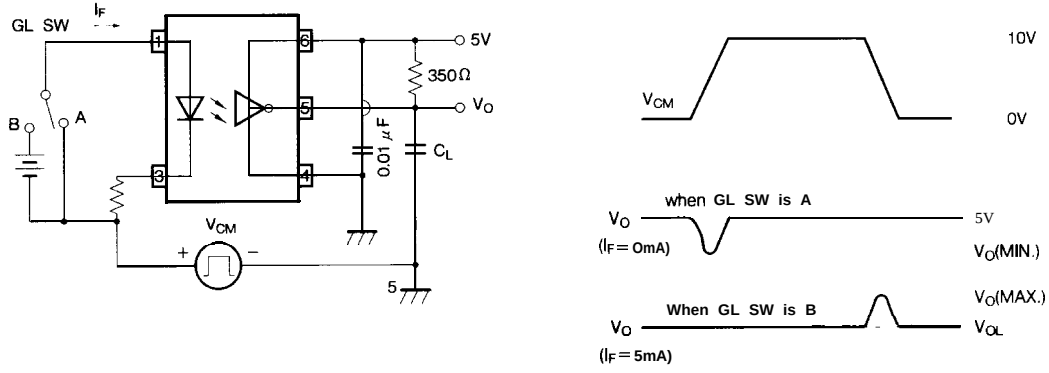


Fig. 3 Collector Power Dissipation vs. Ambient Temperature

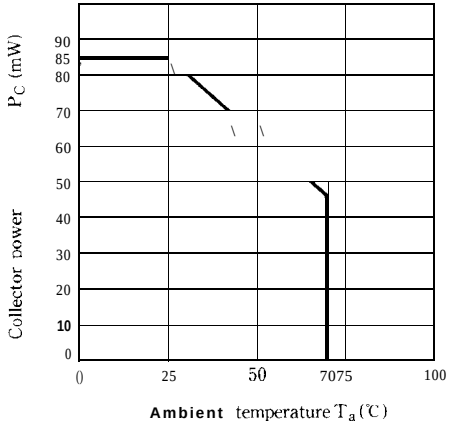


Fig. 4 Forward **Current** vs. **Forward Voltage**

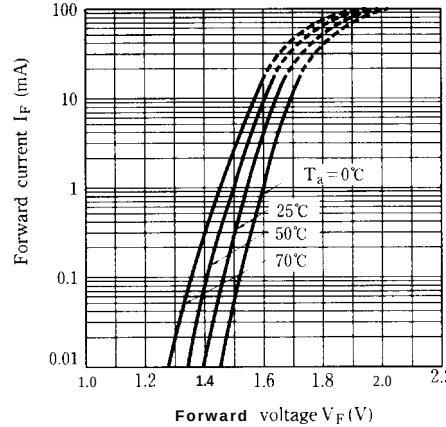


Fig. 5 High Level Output Current vs. Ambient Temperature

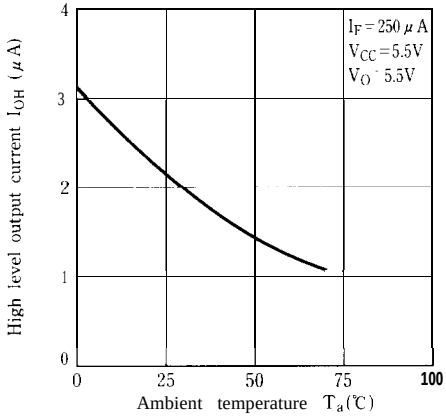


Fig. 6 Low Level Output Voltage vs. Ambient Temperature

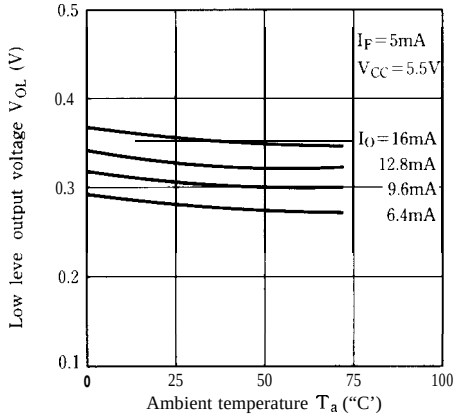


Fig. 7-a Output Voltage vs. Forward Currant

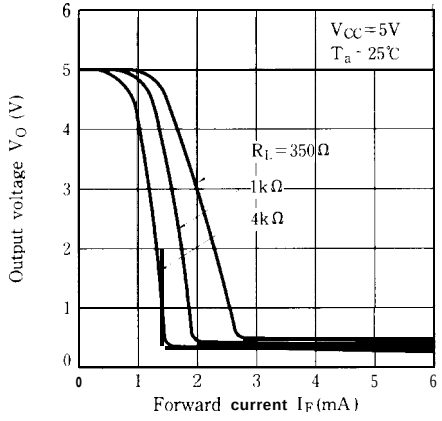


Fig. 7-b Output Voltage vs. Forward Current (Ambient Temp. Characteristics)

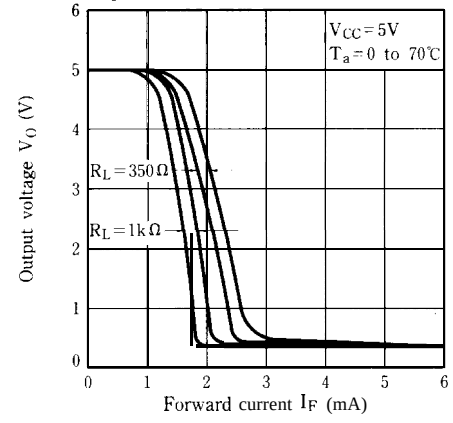


Fig. 8 Propagation Delay Time vs. Forward Current

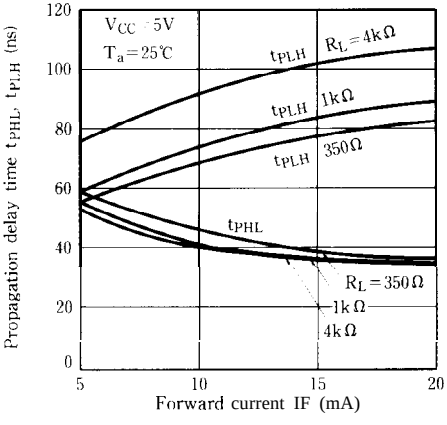


Fig. 9 Propagation Delay Time vs. Ambient Temperature

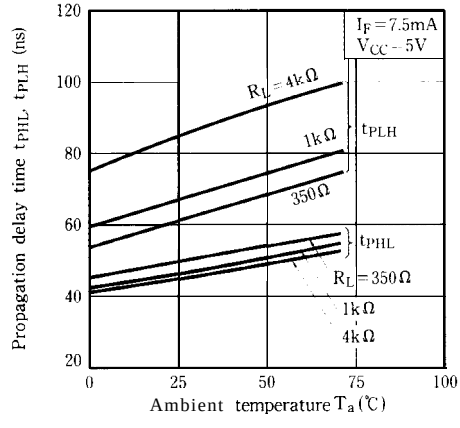
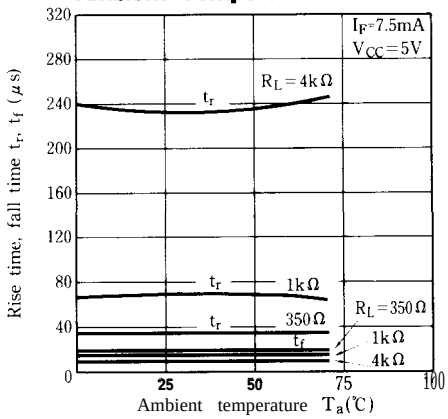


Fig.10 Rise Time,Fall Time vs. Ambient Temperature



■ Precautions for Use

(1) Handle this product the same as with other integrated circuits against static electricity.
(2) As for other general cautions, refer to the chapter “Precautions for Use.” (Page 78 to 93).