PC9D1O

Ultra-high Speed Response, 2-channel OPIC Photocoupler

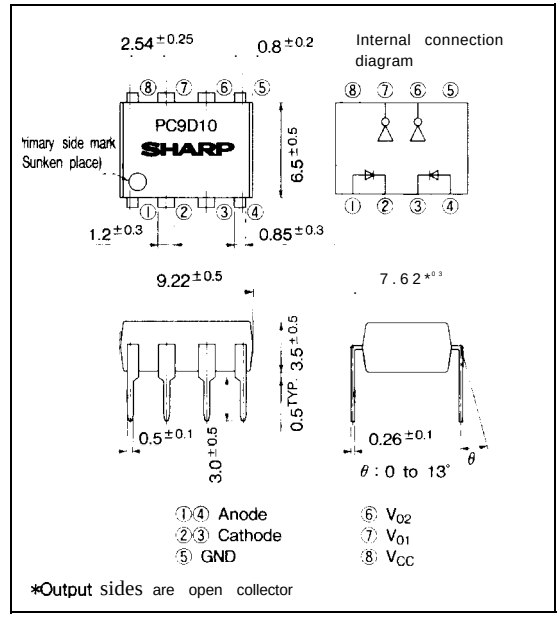
■ Features

1. Built-in 2-channel
2. Ultra-high speed response
   (t_{PHL}, t_{PLH} : TYP. 50ns at $R_L = 350\Omega$)
3. Isolation voltage between input and output
   (V_{ISO} : 2 500V_{rms})
4. Low input current drive (I_{FLH}: MAX. 5mA)
5. Instantaneous common mode rejection voltage CM_H: TYP. 500V/μs
6. Recognized by UL. file No. 64380

■ Applications

1. Computer peripherals high speed interface for microcomputer systems
2. High speed lince recievers
3. Digital audio lince equipment
4. Interface with various data transfer equipment

■ Outline Dimensions (Unit : mm)



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

■ Absoulte Maximum Ratings (Ta = 25℃)

Parameter		Symbol	Rating	Unit
Input	*1*2 Forward current	I_F	15	mA
	*2 Reverse voltage	V_R	5	v
	*1*2 Power dissipation	P	4(I	mW
output	'(SUPPI y voltage	V_{CC}	7	v
	*2High level output voltage	V_{OH}	7	v
	*2Low level output current	I_{OL}	16	mA
	Collector power dissipation	P_C	60	mW
*4 Isolation" voltage		V_{iso}	2500	V_{rms}
Operating temperature		T_{opr}	0 to +70	℃
Storage temperature		T_{stg}	−55 to +125	℃
*5 Soldering temperature		T_{sol}	260	℃

*1 Ta = 0 to 70℃
*2 Each channel
*3 Fnr 1 minute max.
*4 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.
*5 2mm or more away from the lead base for 10 seconds or less

■ Electro-optical Characteristics

(Unless otherwise specified, Ta = O to + 70℃)

		Parameter	Symbol	Conditions	MIN.	TYP.	MAX	Unit
Input		Forward voltage	V_F	Ta=25℃, I_F=10mA		1.6	1.75	v
		Reverse current	I_R	Ta=25℃, V_R=5V	—	—	10	μA
		Terminal capacitance	C_t	Ta=25℃, V=O, f=1MHz	–	60	250	pF
output		High level output current	I_{OH}	V_{CC}=V_O=5.5V, I_F=250μA	–	2	250	μA
		Low level output voltage	V_{OL}	V_{CC}=5.5V, I_F= 5mA, I_{OL}=13mA	—	0.4	0.6	v
		High level supply current	I_{CCH}	V_{CC}=5.5V, I_F=0	·	14	30	mA
		Low level supply current	I_{CCL}	V_{CC}=5.5V, I_F=10mA	—	26	36	mA
Transfer characteristics		"High→Low" threshold input current	I_{FHL}	Vcc = 5V, V_O=0.8V, R_L=350Ω	—	2.5	5	mA
		Isolation resistance	R_{ISO}	Ta=25℃, DC500V, 40 to 60 %RH	5 X 10^{10}	10^{11}		Ω
		Floating capacitance	C_f	Ta=25℃, V=O, f=1MHz	–	0.6	—	pF
	Response time	High . Low propagation delay time	t_{PHL}	Ta=25℃, V_{CC}=5V Fig 1	–	50	75	ns
		Low . High propagation delay time	tPLH	R_L = 350Ω, C_L=15pF	—	50	75	ns
		Rise time, Fall time	t_r, t_f	I_F=7.5mA	—	30	60	ns
	CMR	Instantaneous common mode rejection voltage "High level output"	CM_H	Ta=25℃, V_{CC}=5V, V_{OMIN}=2V Fig. 2 V_{CM}=10 V, R_L=350Ω, I_F=0	100	500	—	V/μs
		Instantaneous common mode rejection voltage "Low level output"	CM_L	Ta=25℃, V_{CC}=5V, V_{OMAX}=0.8V Fig 2 V_{CM}=10V, R_L=350Ω, I_F=5mA	–loo	– 500	–	V/μs

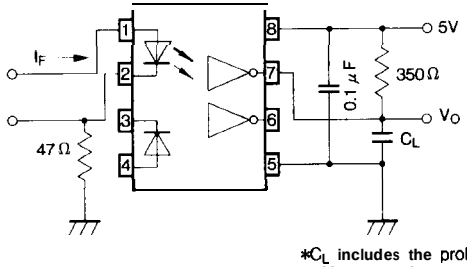
All typical values : at Ta = 25-C, V_{CC} = 5V

■ Recommended Operating 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	Vcc	4.5	5.5	v
Fanout (TTL load)	N	·	8	—
Operating temperature	T_{opr}	0	70	'c

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

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



*C_L includes the probe and wiring capacitance.

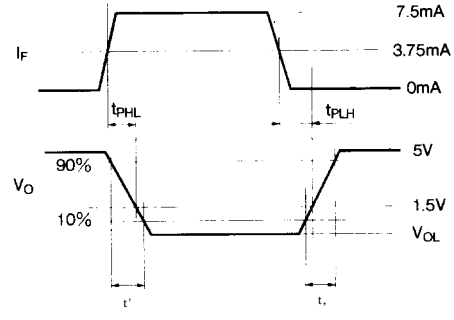
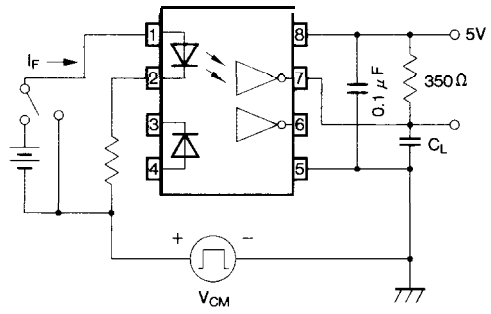


Fig. 2 Test Circuit for CM_H and CM_L



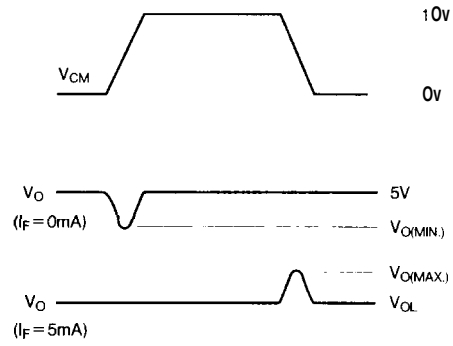


Fig. 3 Collector Power Dissipation vs. Ambient Temperature

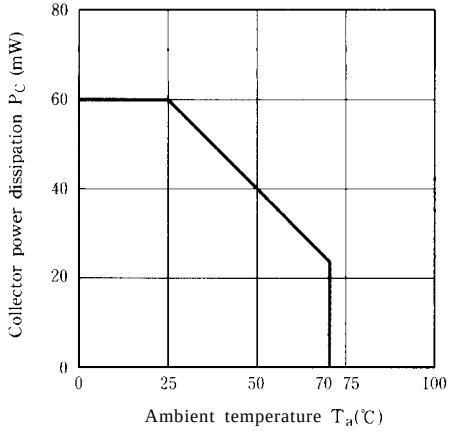


Fig. 4 Forward **Current** va. **Forward Voltage**

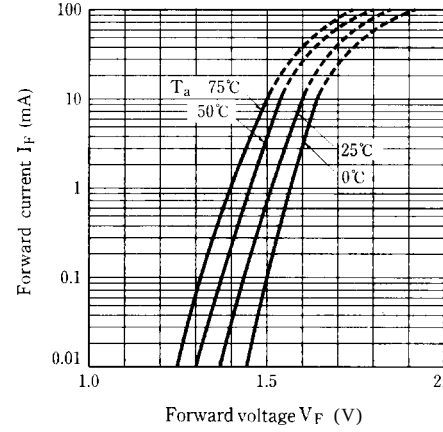


Fig. 5 High Level Output Current vs. Ambient Temperature

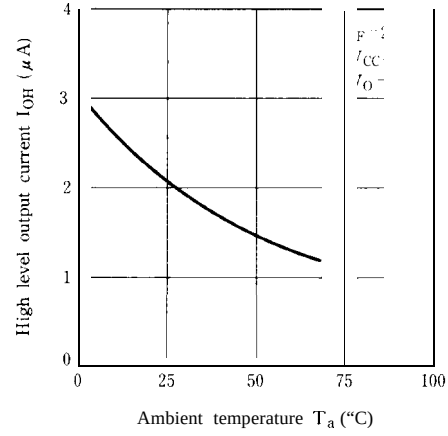


Fig. 6 Low Level Output Voltage vs. Ambient Temperature

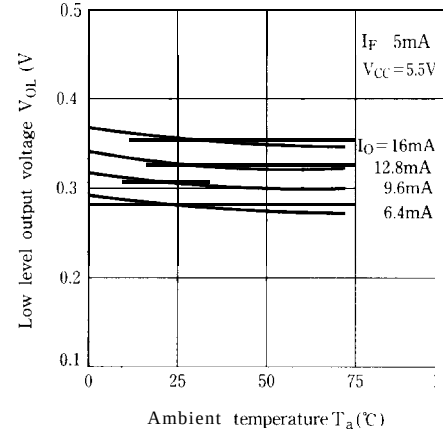


Fig. 7-a **Output Voltage vs. Forward Current**

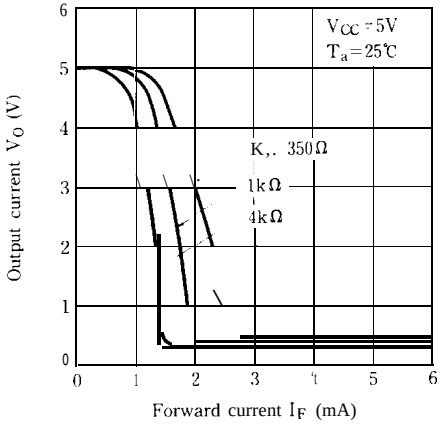


Fig. 7-b Output Voltage vs. Forward Current (Ambient Temp. Characteristics)

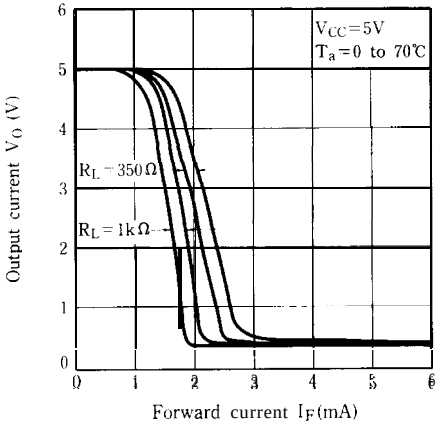


Fig. 8 Propagation Delay Time vs. Forward Currant

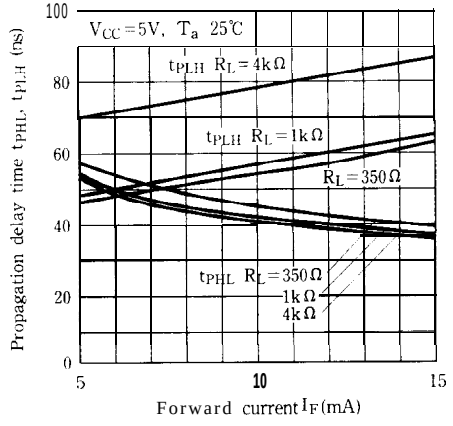


Fig. 9 Propagation Delay Time vs. Ambient Temperature

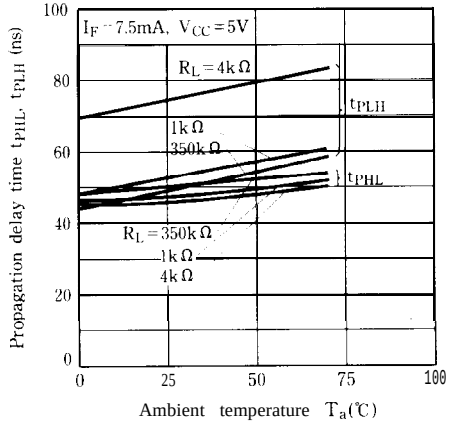
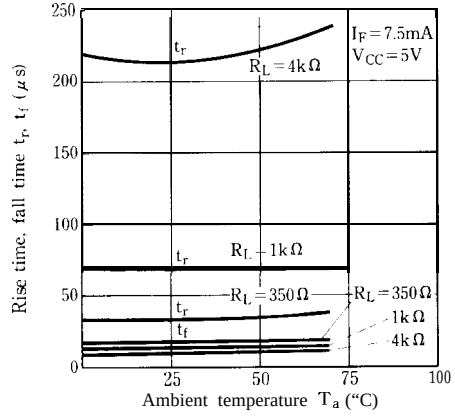


Fig. 10 Rise Time, Fall Time vs. Ambient Temperature



■ 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).