PC9D10

Ultra-high Speed Response, 2-channel OPIC Photocoupler

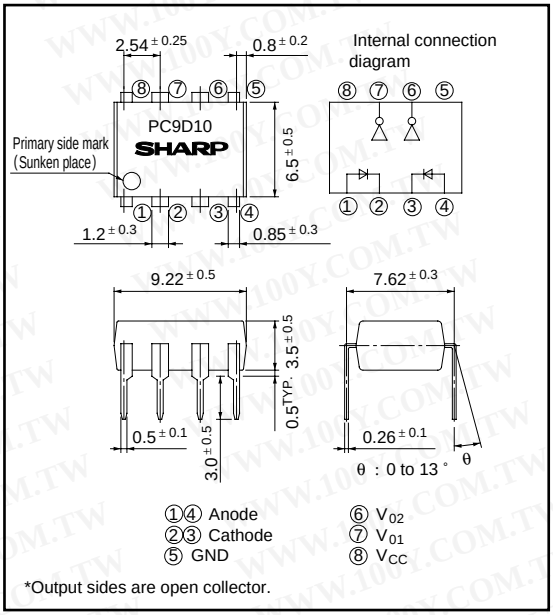
■ Features

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

■ Applications

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

■ Absoulte Maximum Ratings (Ta= 25°C)

Parameter		Symbol	Rating	Unit
Input	*1 *2Forward current	I_F	15	mA
	*2Reverse voltage	V_R	5	V
	*1 *2Power dissipation	P	40	mW
Output	*3Supply 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}	2 500	V_{rms}
Operating temperature		T_{opr}	0 to + 70	°C
Storage temperature		T_{stg}	- 55 to + 125	°C
*5Soldering temperature		T_{sol}	260	°C

*1 Ta= 0 to 70°C
*2 Each channel
*3 For 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 = 0 to + 70˚C)

		Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input		Forward voltage	V_F	Ta = 25˚C, I_F = 10mA	-	1.6	1.75	V
		Reverse current	I_R	Ta = 25˚C, V_R = 5V	-	-	10	μA
		Terminal capacitance	C_t	Ta = 25˚C, V = 0, 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}	V_{CC} = 5V, V_O = 0.8V, R_L = 350Ω	-	2.5	5	mA
		Isolation resistance	R_{ISO}	Ta = 25˚C, DC500V, 40 to 60% RH	5×10^{10}	10^{11}	-	Ω
		Floating capacitance	C_f	Ta = 25˚C, V = 0, f = 1MHz	-	0.6	-	pF
	Response time	"High→Low" propagation delay time	t_{PHL}	Ta = 25˚C, V_{CC} = 5V Fig. 1	-	50	75	ns
		"Low→High" propagation delay time	t_{PLH}	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˚C, V_{CC} = 5V, $V_{O(MIN)}$ = 2V Fig. 2 V_{CM} = 10V, R_L = 350Ω, I_F = 0	100	500	-	V/μs
		Instantaneous common mode rejection voltage "Low level output"	CM_L	Ta = 25˚C, V_{CC} = 5V, $V_{O(MAX)}$ = 0.8V Fig. 2 V_{CM} = 10V, R_L = 350Ω, I_F = 5mA	- 100	- 500	-	V/μs

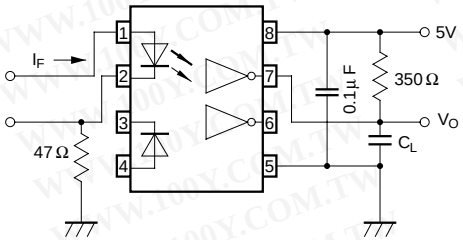
All typical values : at Ta = 25˚C, V_{CC} = 5V

■ 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	V_{CC}	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 0.1μF) 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.

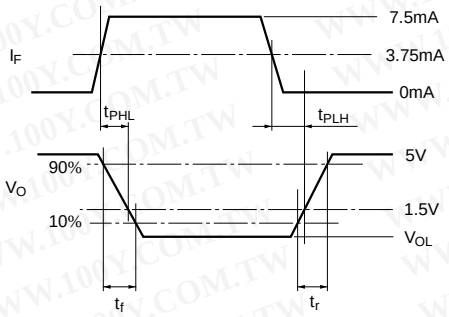
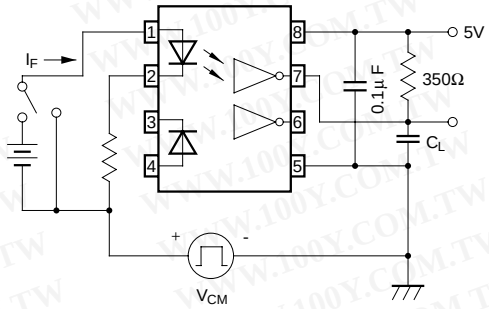


Fig. 2 Test Circuit for CM_H and CM_L



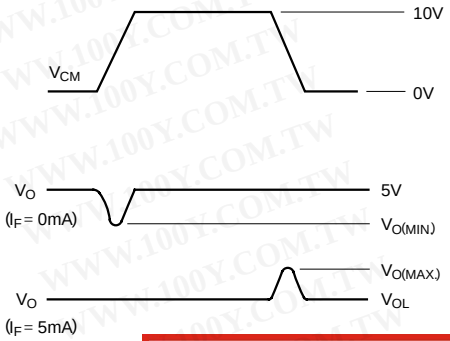


Fig. 3 Collector Power Dissipation vs. Ambient Temperature

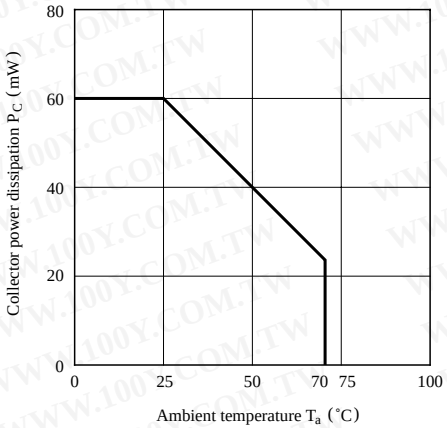


Fig. 4 Forward Current vs. Forward Voltage

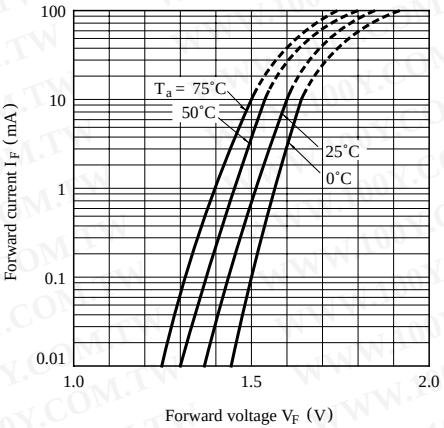


Fig. 5 High Level Output Current vs. Ambient Temperature

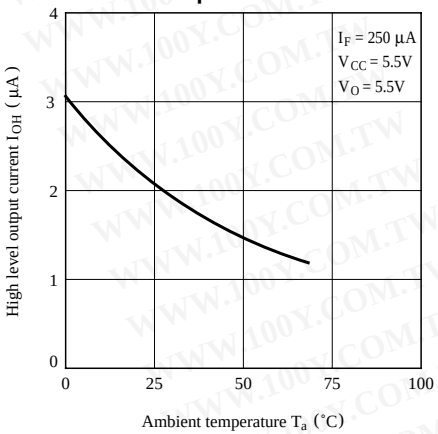


Fig. 6 Low Level Output Voltage vs. Ambient Temperature

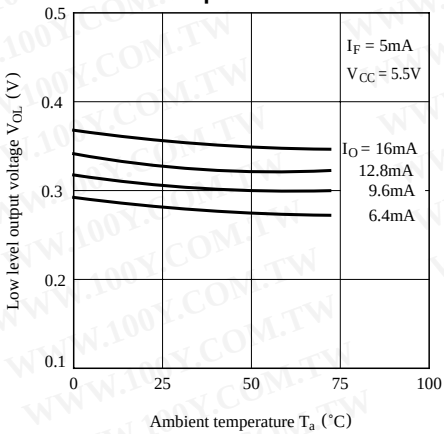


Fig. 7-a Output Voltage vs. Forward Current

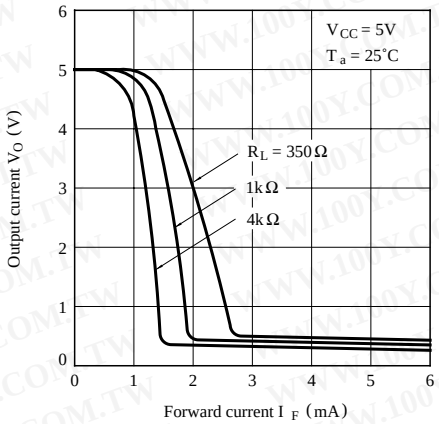


Fig. 7-b Output Voltage vs. Forward Current (Ambient Temp. Characteristics)

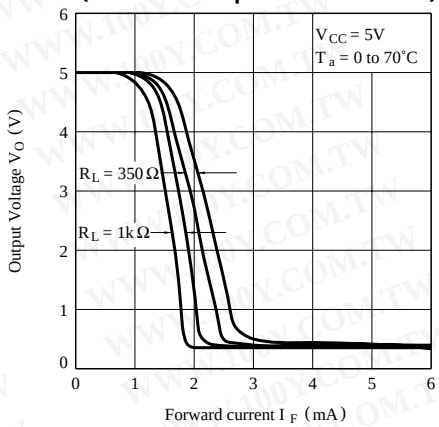


Fig. 8 Propagation Delay Time vs. Forward Current

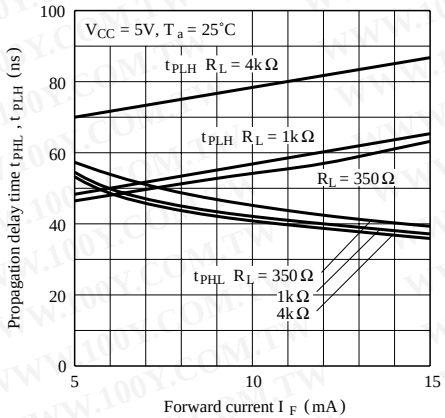


Fig. 9 Propagation Delay Time vs. Ambient Temperature

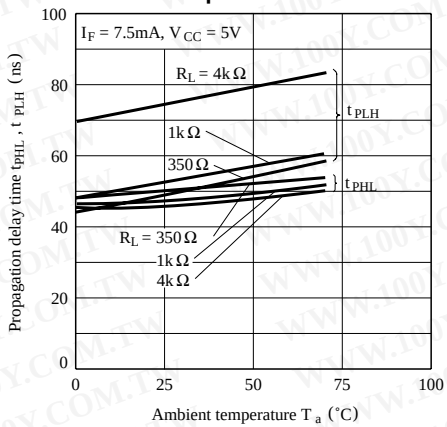
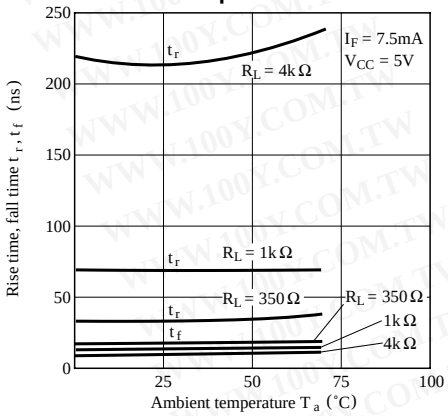


Fig. 10 Rise Time, Fall Time vs. Ambient Temperature



■ 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"

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