PC900V/PC900VQ

Digital Output Type OPIC Photocoupler

※ Lead forming type (I type) and taping reel type (P type) are also available. (**PC900VI/PC900VP**) (Page 656)
※※ TÜV (DIN-VDE0884) approved type is also available as an option.

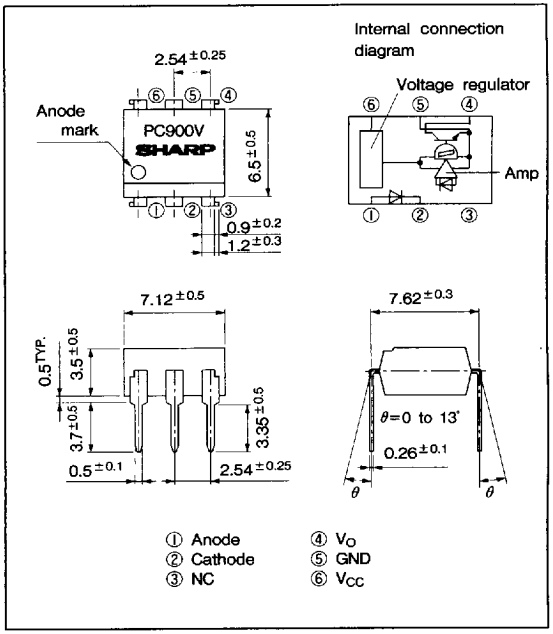
■ Features

1. High reliability type (**PC900VQ**)
   ① Temperature cycling
   Ta = −40℃ (30 min.) → +125℃
   (30 min.), 10 cycles
   ② High temperature storage
   Ta = +125℃ (20 hours)
2. Normal OFF operation, open collector output
3. TTL and LSTTL compatible output
4. Operating supply voltage V_{CC} : 3 to 15V
5. High isolation voltage between input and output (V_{iso} : 5 000V_{rms})
6. Recognized by UL, file No. E64380

■ Applications

1. Isolation between logic circuits
2. Logic level shifters
3. Line receivers
4. Replacements for relays and pulse transformers
5. Noise reduction

■ 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.

■ Absolute Maximum Ratings (Ta = 25℃)

Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	50	mA
	*1Peak forward current	I_{FM}	1	A
	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	150	mW
Total power dissipation		P_{tot}	170	mW
*2Isolation voltage		V_{iso}	5 000	V_{rms}
Operating temperature		T_{opr}	−25 to +85	℃
Storage temperature		T_{stg}	−40 to +125	℃
*3Soldering temperature		T_{sol}	260	℃

*1 Pulse width ≦ 100 μs, Duty ratio = 0.001
*2 40 to 60% RH, AC for 1 minute
*3 For 10 seconds

■ Electro-optical Characteristics

(Ta = 0 to +70℃ unless specified)

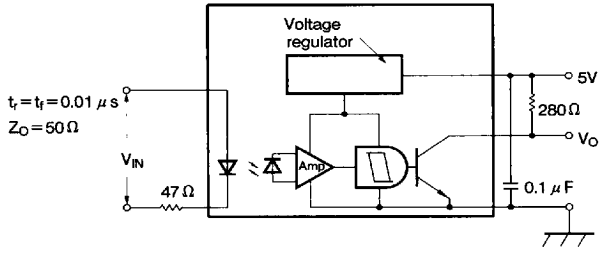
Parameter			Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage		V_F	I_F=4mA	–	1.1	1.4	V
				I_F=0.3mA	0.7	1.0	–	
	Reverse current		I_R	Ta=25℃, V_R=3V	–	–	10	μA
	Terminal capacitance		C_t	Ta=25℃, V=0, f=1kHz	–	30	250	pF
Output	Operating supply voltage		V_{CC}		3	–	15	V
	Low level output voltage		V_{OL}	I_{OL}=16mA, V_{CC}=5V, I_F=4mA	–	0.2	0.4	V
	High level output current		I_{OH}	V_O=V_{CC}=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	*4 "High→Low" threshold input current		I_{FHL}	Ta=25℃, V_{CC}=5V, R_L=280Ω	–	1.1	2.0	mA
				V_{CC}=5V, R_L=280Ω	–	–	4.0	
	*5 "Low→High" threshold input current		I_{FLH}	Ta=25℃, V_{CC}=5V, R_L=280Ω	0.4	0.8	–	mA
				V_{CC}=5V, R_L=280Ω	0.3	–	–	
	*6Hysteresis		I_{FLH}/I_{FHL}	V_{CC}=5V, R_L=280Ω	0.5	0.7	0.9	–
	Isolation resistance		R_{ISO}	Ta=25℃, DC500V, 40 to 60% RH	5×10^{10}	10^{11}	–	Ω
	*7Response time	"High→Low" propagation delay time	t_{PHL}	Ta=25℃ V_{CC}=5V, I_F=4mA R_L=280Ω	–	1	3	μs
		"Low→High" propagation delay time	t_{PLH}		–	2	6	
		Fall time	t_f		–	0.05	0.5	
		Rise time	t_r		–	0.1	0.5	

*4 I_{FHL} represents forward current when output goes from high to low.
*5 I_{FLH} represents forward current when output goes from low to high.
*6 Hysteresis stands tor I_{FLH}/I_{FHL}.
*7 Test circuit for response time is shown below.

〈Precautions for Use〉

Connect a capacitior of more than 0.1 μF between V_{CC} and GND.

Test Circuit for Response Time



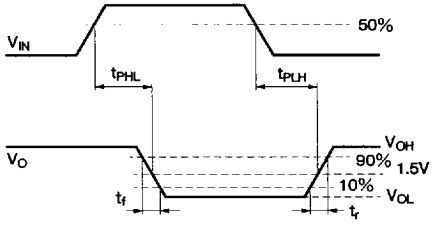


Fig. 1 Forward Current vs. Ambient Temperature

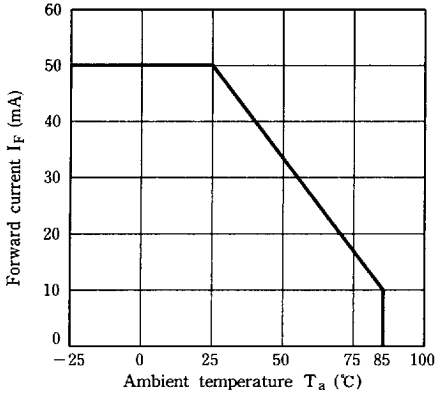


Fig. 2 Power Dissipation vs. Ambient Temperature

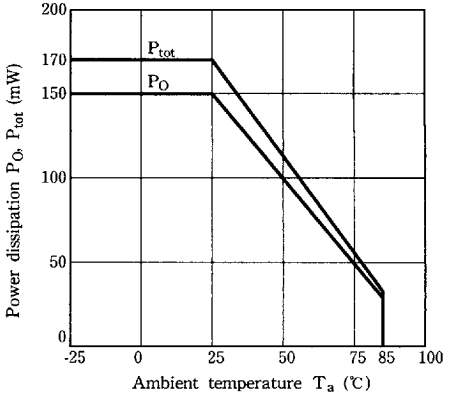


Fig. 3 Forward Current vs. Forward Voltage

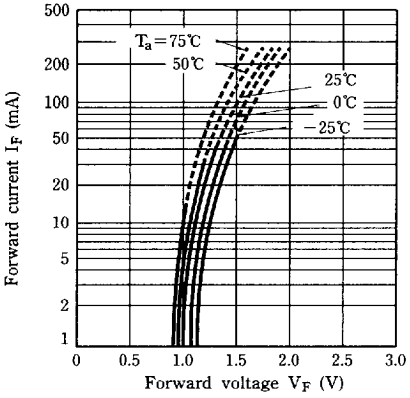


Fig. 4 Relative Threshold Input Current vs. Supply Voltage

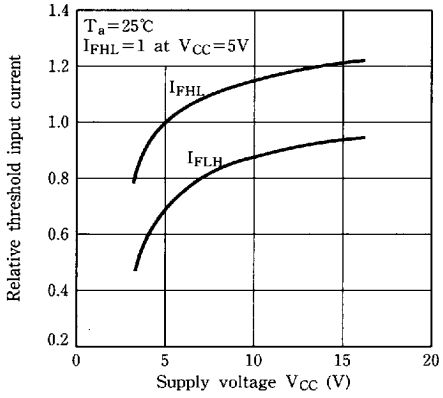


Fig. 5 Relative Threshold Input Current vs. Ambient Temperature

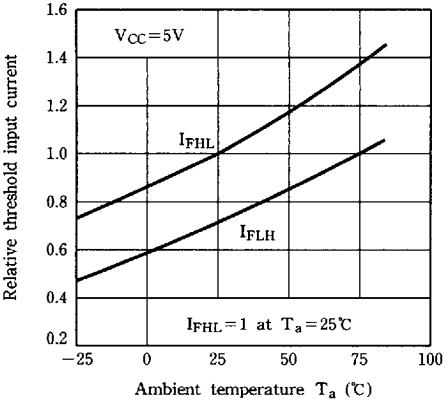


Fig. 6 Low Level Output Voltage vs. Low Level Output Current

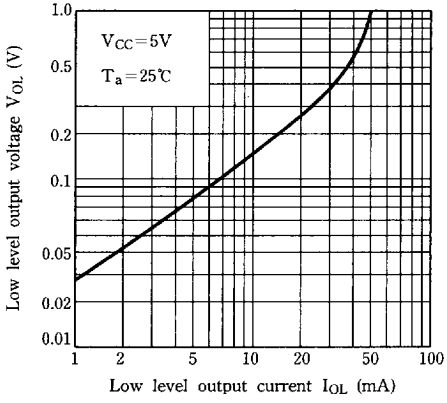


Fig. 7 Low Level Output Voltage vs. Ambient Temperature

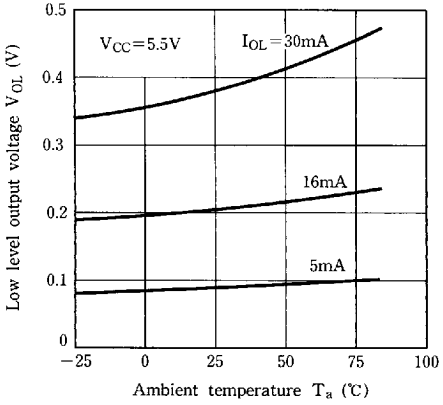


Fig. 8 Supply Current vs. Supply Voltage

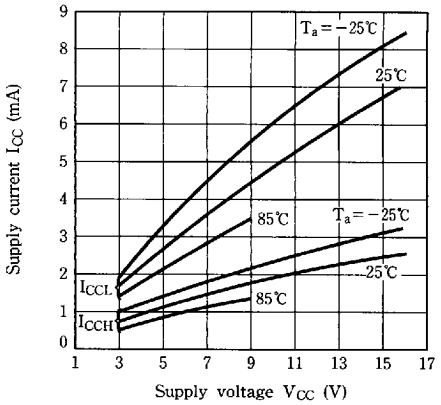


Fig. 9 Propagation Delay Time vs. Forward Current

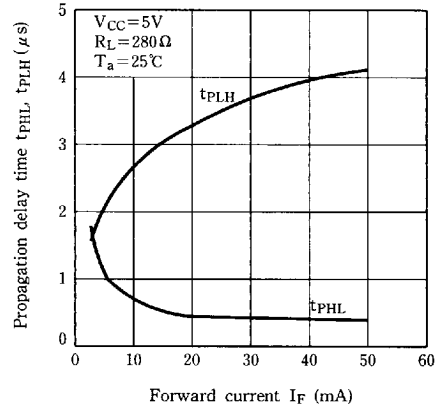
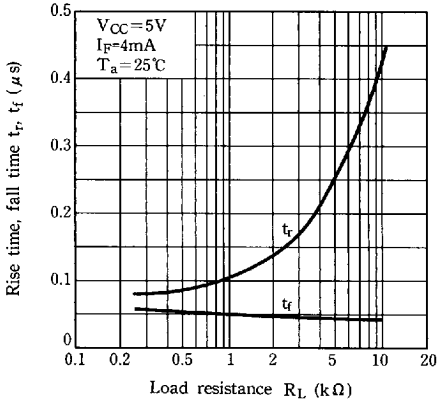


Fig.10 Rise Time, Fall Time vs. Load Resistance



■ Precautions for Use

(1) It is recommended that a by-pass capacitor of more than 0.01 μF 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.

・Please refrain from soldering under preheating and refrain from soldering by reflow.

● Please refer to the chapter "Precautions for Use." (Page 78 to 93).