

PC920 Power OPIC Photocoupler

T-41-83

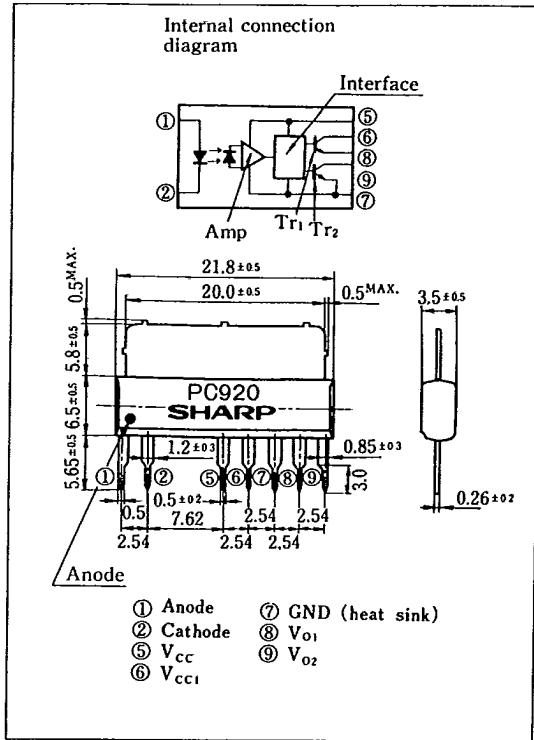
Features

- High power
(I_{O1} : MAX. -0.8A (DC))
(I_{O2} : MAX. 1.6A (Pulse))
- Low input current drive
(I_{FLH} : MAX. 2mA at $T_a = T_{opr}$)
- Operating supply voltage V_{CC} : 5.4~15V
- Compact single-in-line package (With heat sink)
- UL recognized, file No. E64380

Applications

- Inverter controlled air conditioners

Outline Dimensions (Unit : mm)



※ OPIC is a registered trademark of Sharp and stands for Optical IC. It has a light detecting element and signal processing circuitry integrated onto a single chip.

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Absolute Maximum Ratings

($T_a = 25^\circ\text{C}$)

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
	V_{O1} output current	I_{O1}	-0.8	A
	*1 V_{O2} output current	I_{O2P}	1.6	A
	Total power dissipation	P_{tot}	1,200	mW
	*2 Isolation voltage	V_{iso}	1,500	V _{rms}
Operating temperature		T_{opr}	-20 ~ +80	°C
Storage temperature		T_{stg}	-55 ~ +125	°C
*3 Soldering temperature		T_{sol}	260	°C

*1 Pulse width $\leq 10\mu\text{s}$, Duty ratio = 0.02

*2 RH = 40~60%, AC for 1 minute

*3 For 10 seconds

SHARP

■ Electro-optical Characteristics

(Ta = 25°C unless specified)

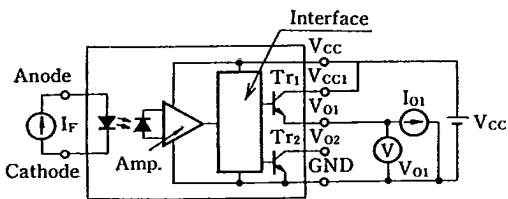
Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit	
Input	Forward voltage	V _F	I _F = 2mA	—	1.1	1.4	V	
			I _F = 0.1mA	0.6	0.95	—		
	Reverse current	I _R	V _R = 3V	—	—	10	μA	
Terminal capacitance		C _t	V = 0, f = 1kHz	—	30	80	pF	
Operating supply voltage		V _{CC}		5.4	6.0	15	V	
Output	V _{O1} output voltage	V _{O1}	V _{CC} = V _{CC1} = 6V, I _{O1} = -0.3A, I _F = 2mA	4.5	5.2	—	V	
	V _{O2} output voltage	V _{O2}	V _{CC} = V _{CC1} = 6V, I _{O2P} = 1A, I _F = 0	—	0.3	2.0	V	
	V _{O1} leak current	I _{O1L}	V _{CC} = V _{CC1} = 6V, V _{O1} = GND, I _F = 0	—	—	200	μA	
	V _{O2} leak current	I _{O2L}	V _{CC} = V _{CC1} = V _{O2} = 6V, I _F = 2mA	—	—	200	μA	
	High level supply current	I _{CCH}	V _{CC} = V _{CC1} = 6V, I _F = 2mA	—	5	10	mA	
	Low level supply current	I _{CCL}	V _{CC} = V _{CC1} = 6V, I _F = 0	—	12	20	mA	
	**"Low→High" threshold input current	I _{FLH}	V _{CC} = V _{CC1} = 6V, R _{L1} = 15Ω Ta = T _{OPR} , V _{CC} = V _{CC1} = 6V, R _{L1} = 15Ω	—	0.5	1.0	mA	
Transfer characteristics	Isolation resistance	R _{ISO}	DC = 500V, RH = 40~60%	5 × 10 ¹⁰	10 ¹¹	—	Ω	
	Response time	"Low→High" propagation time	t _{PLH}	V _{CC} = V _{CC1} = 6V	—	3	10	μs
		"High→Low" propagation time	t _{PHL}	I _F = 2mA	—	3	10	
		Rise time	t _r	R _{L1} = 15Ω	—	0.2	2	
		Fall time	t _f	R _{L2} = 18Ω	—	0.2	2	

*4 I_{FLH} represents forward current when output goes from "low" to "high".

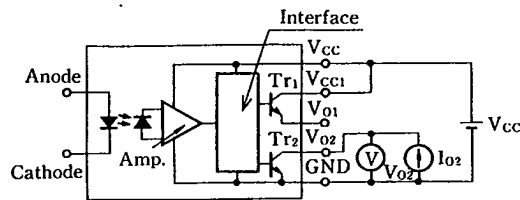
■ Truth Table

Input	Output	Tr ₁	Tr ₂
ON	High level	ON	OFF
OFF	Low level	OFF	ON

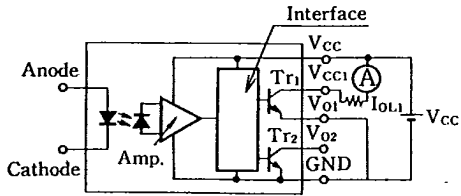
Test Circuit for V_{O1}



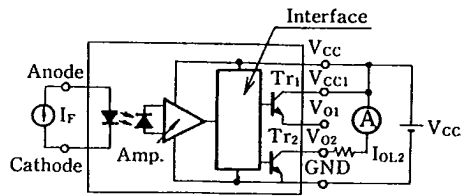
Test Circuit for V_{O2}



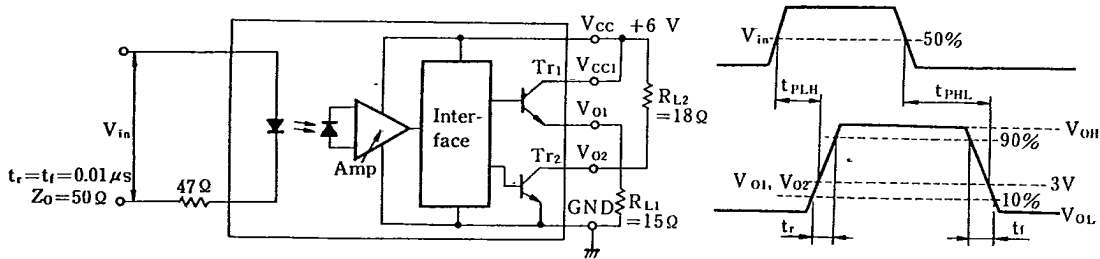
Test Circuit for I_{OL1}



Test Circuit for I_{OL2}



Test Circuit for Response Time



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Fig. 1 Forward Current vs. Ambient Temperature

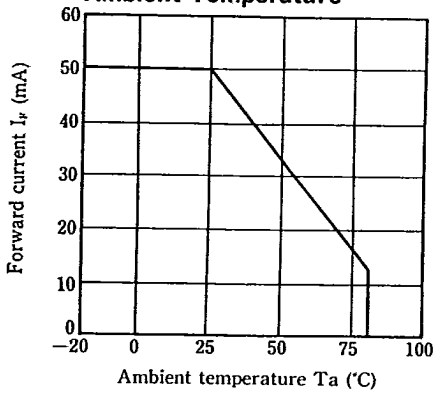


Fig. 2 Total Power Dissipation vs. Ambient Temperature

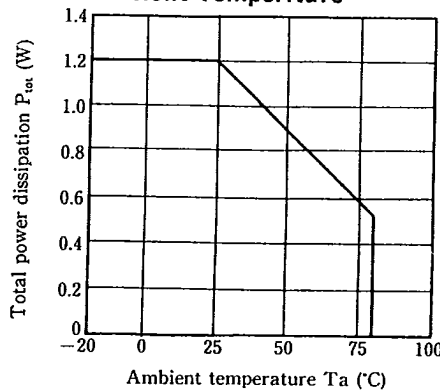


Fig. 3 Forward Current vs. Forward Voltage

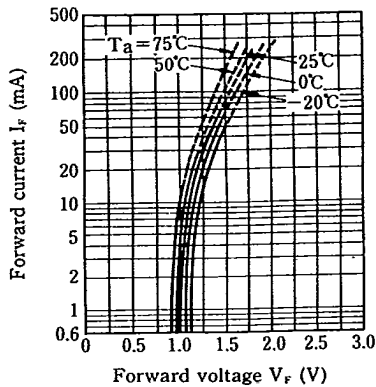


Fig. 4 Relative Threshold Input Current vs. Supply Voltage

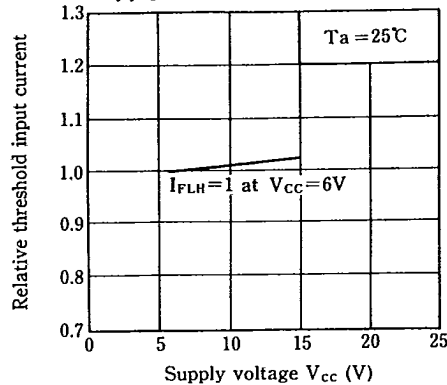


Fig. 5 Relative Threshold Input Current vs. Ambient Temperature

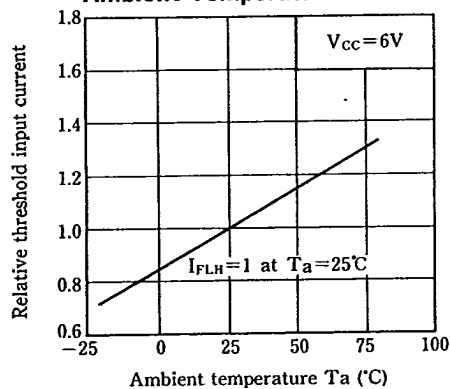


Fig. 6 Output Voltage vs. Output Current (Tr_1)

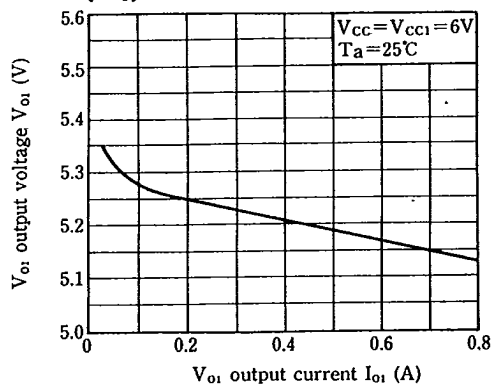


Fig. 7 Output Voltage vs. Output Current (Tr_2)

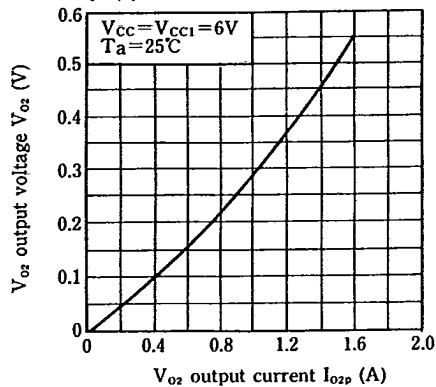


Fig. 8 Output Voltage vs. Ambient Temperature (Tr_1)

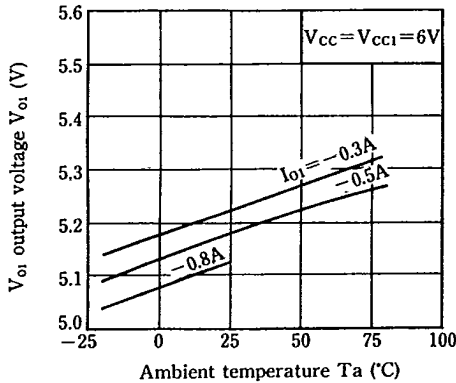


Fig. 9 Output Voltage vs. Ambient Temperature (T_r)

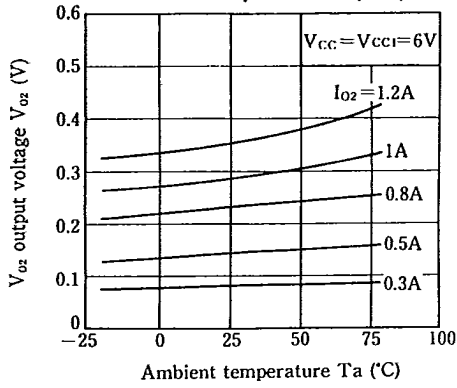


Fig. 10 Supply Current vs. Supply Voltage

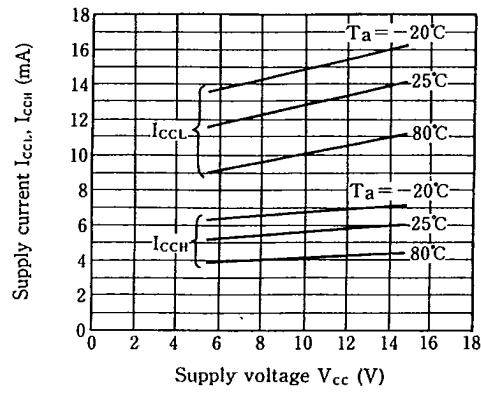


Fig. 11 Propagation Time vs. Forward Current

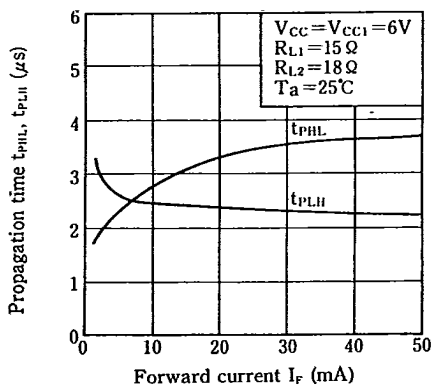
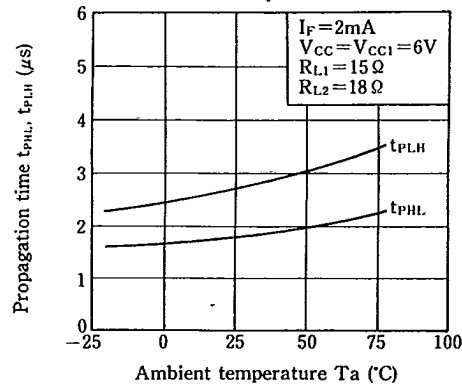


Fig. 12 Propagation Time vs. Ambient Temperature



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Application Circuit Example

