PC957

High Speed and High CMR OPIC Photocoupler

■ Features

1. High resistance to noise (CMR:MIN. 15kV/μs)
2. High speed response
   (t_{PHL}:MAX. 0.8μs, t_{PLH}:MAX. 0.8μs)
3. Standard DIP type
4. Isolation voltage (Viso (rms)=2.5kV)
5. Recognized by UL, file No. E64380

■ Applications

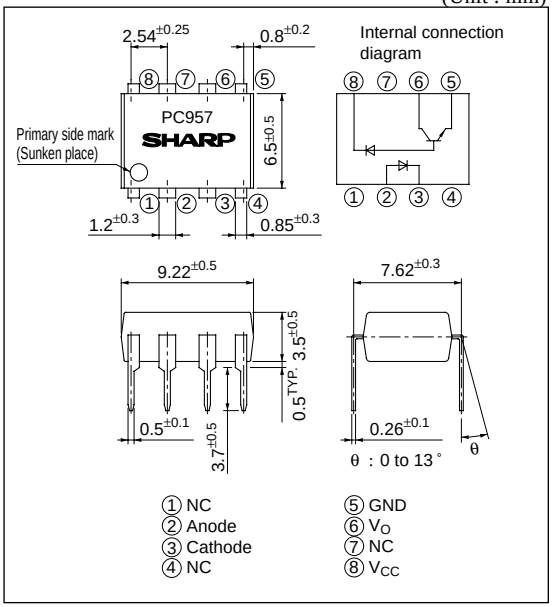
1. Programmable controller
2. Inverter

■ Absolute Maximum Ratings (Ta=25°C)

Parameter		Symbol	Rating	Unit
Input	*1 Forward current	I_F	25	mA
	Reverse voltage	V_R	5	V
	*2 Power dissipation	P	45	mW
Output	Output current	I_O	8	mA
	Supply voltage	V_{CC}	−0.5 to +30	V
	Output voltage	V_O	−0.5 to +20	V
	*3 Power dissipation	P_O	100	mW
*4 Isolation voltage		$V_{iso\ (rms)}$	2.5	kV
Operating temperature		T_{opr}	−55 to +100	°C
Storage temperature		T_{stg}	−55 to +125	°C
*5 Soldering temperature		T_{sol}	260	°C

*1 When ambient temperature goes above 70°C, the power dissipation goes down at 0.45mA/°C.
*2 When ambient temperature goes above 70°C, the power dissipation goes down at 0.8mA/°C.
*3 When ambient temperature goes above 70°C, the power dissipation goes down at 1.8mA/°C.
*4 40 to 60%RH, AC for 1 min
*5 For 10 s

■ 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.

■ Electro-optical Characteristics *6

(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=16mA	–	1.7	1.95	V
	Reverse current	I_R	Ta=25˚C, V_R=5V	–	–	10	μA
	Terminal capacitance	C_t	Ta=25˚C, V_F=0V, f=1MHz	–	60	250	pF
Output	High level output current (1)	$I_{OH\ (1)}$	Ta=25˚C, I_F=0, V_{CC}=V_O=5.5V	–	3	500	nA
	High level output current (2)	$I_{OH\ (2)}$	Ta=25˚C, I_F=0, V_{CC}=V_O=15V	–	0.01	1	μA
	High level output current (3)	$I_{OH\ (3)}$	I_F=0, V_{CC}=V_O=15V	–	–	50	μA
	Low level output voltage	V_{OL}	I_F=16mA, V_{CC}=4.5V, I_O=2.4mA	–	0.1	0.4	V
	Low level supply current	I_{CCL}	I_F=16mA, V_{CC}=15V, V_O=open	–	120	–	μA
	High level supply current (1)	$I_{CCH\ (1)}$	Ta=25˚C, I_F=0, V_{CC}=15V, V_O=open	–	0.02	1	μA
	High level supply current (2)	$I_{CCH\ (2)}$	I_F=0, V_{CC}=15V, V_O=open	–	–	2	μA
Transfer characteristics	Current transfer ratio (1)	CTR (1)	Ta=25˚C, I_F=16mA, V_{CC}=4.5V, V_O=0.4V	19	30	–	%
	Current transfer ratio (2)	CTR (2)	I_F=16mA, V_{CC}=4.5V, V_O=0.4V	15	–	–	%
	Isolation resistance	R_{ISO}	Ta=25˚C, DC=500V, 40 to 60%RH	5×10^{10}	1×10^{11}	–	Ω
	Floating capacitance	C_f	Ta=25˚C, V=0V, f=1MHz	–	0.6	1	pF
	*7 "High→Low" propagation delay time	t_{pHL}	Ta=25˚C, V_{CC}=5V, I_F=16mA, R_L=1.9Ω	–	0.2	0.8	μs
	*7 "Low→High" propagation delay time	t_{pLH}		–	0.6	0.8	μs
	*8 Instantaneous common mode rejection voltage "Output : High level"	CM_H	Ta=25˚C, I_F=0, $V_{CM\ (p-p)}$=1.0kV, R_L=1.9kΩ	15	30	–	kV/μs
	*8 Instantaneous common mode rejection voltage "Output : Low level"	CM_L	Ta=25˚C, I_F=16mA, $V_{CM\ (p-p)}$=1.0kV, R_L=1.9kΩ	−15	−30	–	kV/μs

*6 When measuring output and transfer characteristics, connect a by-pass capacitor (0.01μF or more) between V_{CC} ⑧ and GND ⑤ near the **PC957**.
*7 Refer to Fig.1
*8 Refer to Fig.2

Fig.1 Test Circuit for Propagation Delay Time

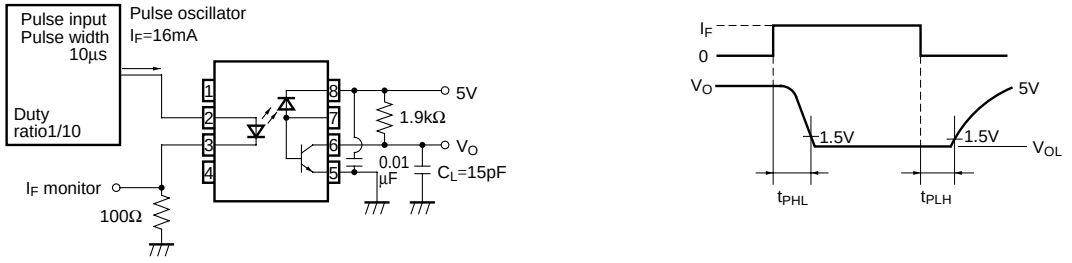
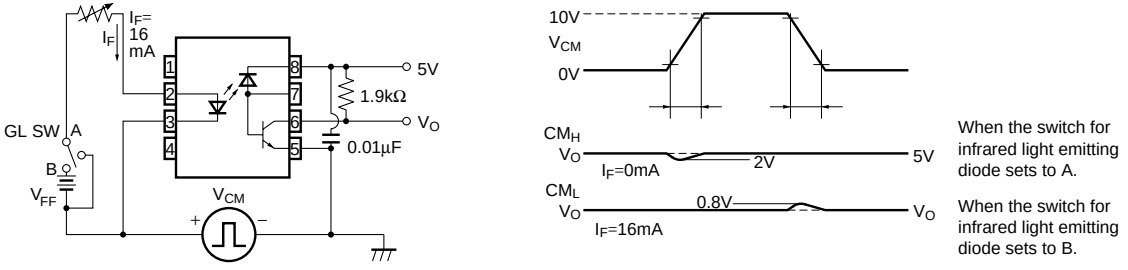


Fig.2 Test Circuit for Instantaneous Common Mode Rejection Voltage



When the switch for infrared light emitting diode sets to A.

When the switch for infrared light emitting diode sets to B.

Fig.3 Forward Current vs. Ambient Temperature

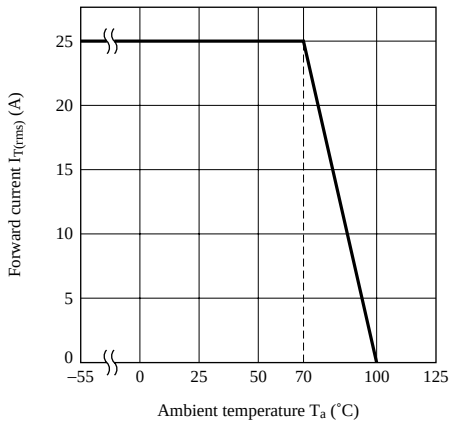
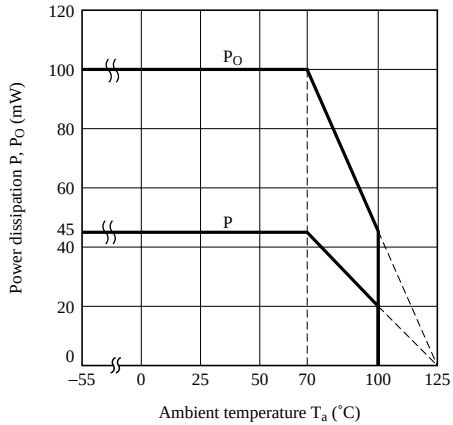


Fig.4 Power Dissipation vs. Ambient Temperature



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