

PC457

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. Mini-flat package
4. Isolation voltage (Viso (rms)):2.5kV
5. Recognized by UL, file No. E64380

■ Applications

1. Programmable controller
2. Inverter

■ Package Specifications

Model No.	Package specification	Diameter of reel	Tape width
PC457	Taping package (3 000pcs.)	φ370mm	13.5mm
PC457T	Taping package (750pcs.)	φ180mm	13.5mm

■ 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	Supply voltage	V_{CC}	-0.5 to +30	V
	Output voltage	V_O	-0.5 to +20	V
	Output current	I_O	8	mA
	*3 Power dissipation	P_O	100	mW
	*3 Total power dissipation	P_{tot}	100	mW
	*4 Isolation voltage	$V_{iso (rms)}$	2.5	kV
	Operating temperature	T_{opr}	-40 to +100	°C
	Storage temperature	T_{stg}	-40 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.

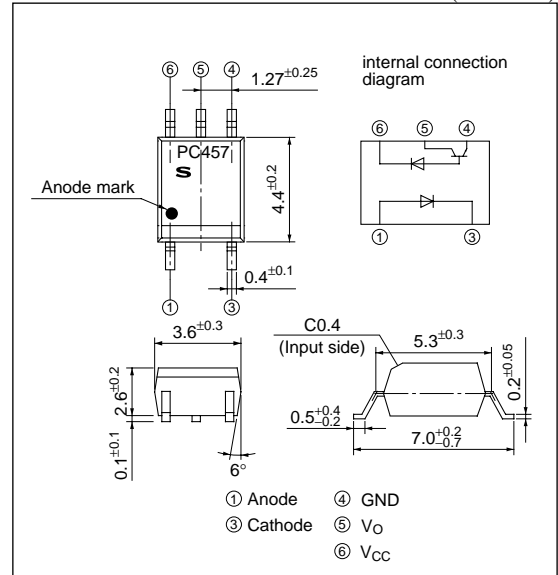
*3 When ambient temperature goes above 70°C, the power dissipation goes down at 1.8mA/°C.

*4 40 to 60%RH, AC for 1 min

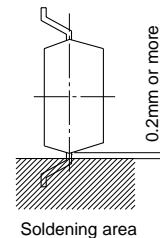
*5 For 10 s

■ 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

(Unless otherwise specified Ta=0 to +70°C)

Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage	$I_F=16\text{mA}$	—	1.7	1.95	V
	Reverse current	$V_R=5\text{V}$	—	—	10	μA
	Terminal capacitance	$V_F=0\text{V}, f=1\text{MHz}$	—	60	250	pF
Output	High level output current (1)	$I_F=0\text{mA}, V_{CC}=5.5\text{V}, V_O=5.5\text{V}$	—	3	500	nA
	High level output current (2)	$I_F=0\text{mA}, V_{CC}=15\text{V}, V_O=15\text{V}$	—	—	1.0	μA
	*6 High level output current (3)	$I_F=0\text{mA}, V_{CC}=15\text{V}, V_O=15\text{V}$	—	—	50	μA
	High level supply current (1)	$I_F=0\text{mA}, V_{CC}=15\text{V}, V_O=\text{open}$	—	0.02	1.0	μA
	*6 High level supply current (2)	$I_F=0\text{mA}, V_{CC}=15\text{V}, V_O=\text{open}$	—	—	2.0	μA
	Low level supply current	$I_F=16\text{mA}, V_{CC}=15\text{V}, V_O=\text{open}$	—	200	—	μA
	Low level output voltage	$I_F=16\text{mA}, V_{CC}=4.5\text{V}, I_O=2.4\text{mA}$	—	—	0.4	V
	Current transfer ratio (1)	$I_F=16\text{mA}, V_{CC}=4.5\text{V}, V_O=0.4\text{V}$	19	—	50	%
Transfer characteristics	*6 Current transfer ratio (2)	$I_F=16\text{mA}, V_{CC}=4.5\text{V}, V_O=0.4\text{V}$	15	—	—	%
	*7 "High→Low" propagation delay time	$I_F=16\text{mA}, V_{CC}=5\text{V}$ $R_L=1.9\text{k}\Omega$	—	0.2	0.8	μs
	*7 "Low→High" propagation delay time		—	0.6	0.8	μs
	*8 Instantaneous common mode rejection voltage "Output : High level"	$I_F=0\text{mA}, R_L=1.9\text{k}\Omega$ $V_{CC}=5\text{V}, V_{CM(p-p)}=1.0\text{kV}$	15	30	—	$\text{kV}/\mu\text{s}$
	*8 Instantaneous common mode rejection voltage "Output : Low level"	$I_F=16\text{mA}, R_L=1.9\text{k}\Omega$ $V_{CC}=5\text{V}, V_{CM(p-p)}=1.0\text{kV}$	-15	-30	—	$\text{kV}/\mu\text{s}$
	Isolation resistance	DC=500V, 40 to 60%RH	5×10^{10}	1×10^{11}	—	Ω
	Floating capacitance	$V=0\text{V}, f=1\text{MHz}$	—	0.6	1.0	pF

*6 Ta=0 to 70°C

*7 Refer to Fig.1

*8 Refer to Fig.2

*9 Each characteristic shall be measured under shielded from the light

Fig.1 Test Circuit for Propagation Delay Time

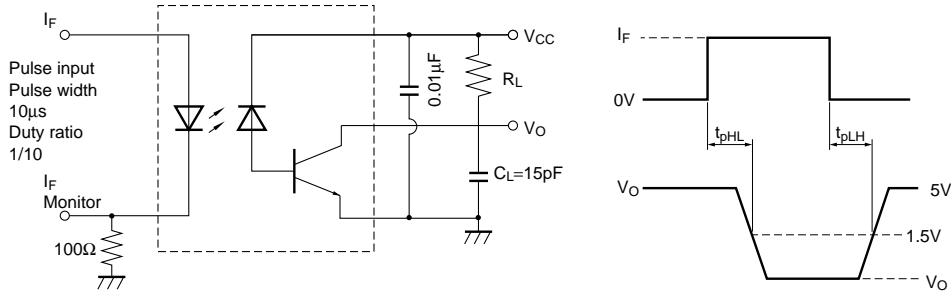


Fig.2 Test Circuit for Instantaneous Common Mode Rejection Voltage

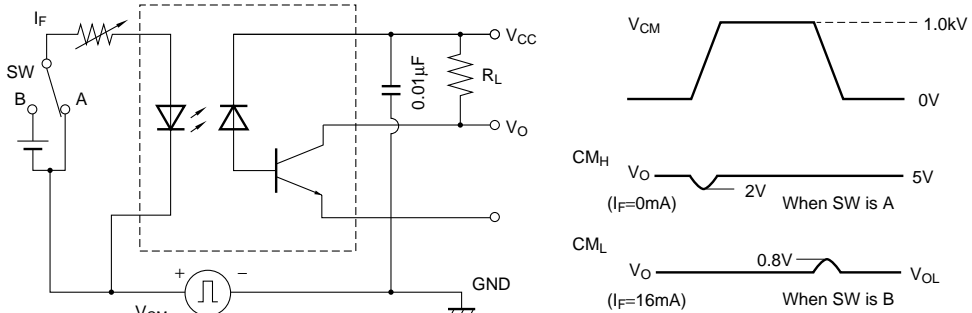


Fig.3 Forward Current vs. Ambient Temperature

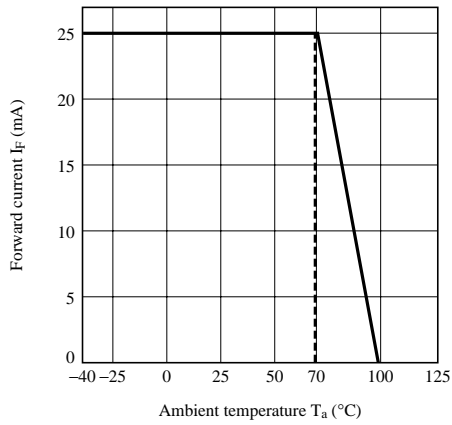
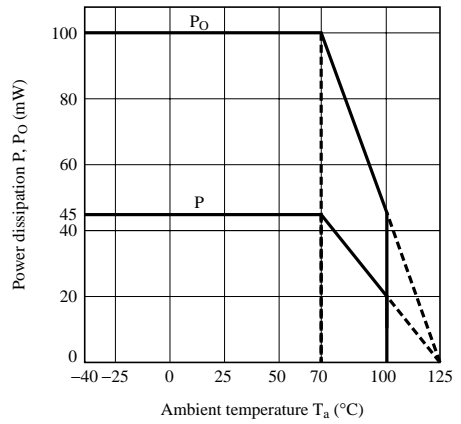


Fig.4 Power Dissipation P , P_o vs. Ambient Temperature



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