

PC457L0NIP

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 ($V_{iso(rms)}$):3.75kV)
5. Recognized by UL, file No. E64380 (Model No. **PC457L**)

■ Applications

1. Programmable controller
2. Inverter

■ Absolute Maximum Ratings

(T_a=25°C)

Parameter	Symbol	Rating	Unit	
Input	*1 Forward current	I _F	25	mA
	Reverse voltage	V _R	5	V
Output	*2 Power dissipation	P	45	mW
	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)}	3.75	kV
	Operating temperature	T _{opr}	-55 to +100	°C
	Storage temperature	T _{stg}	-55 to +125	°C
	*5 Soldering temperature	T _{sol}	270	°C

*1 When ambient temperature goes above 70°C, the power dissipation goes down at 0.8mA/°C

*2 When ambient temperature goes above 70°C, the power dissipation goes down at 0.8mW/°C

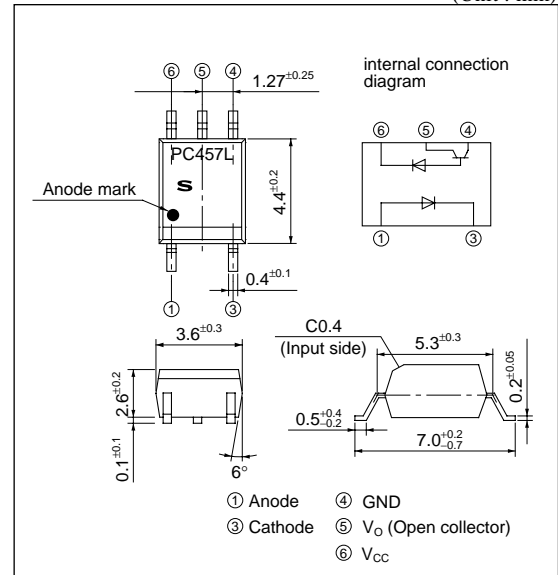
*3 When ambient temperature goes above 70°C, the power dissipation goes down at 1.8mW/°C

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

*5 For 10s

■ 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

(T_a=25°C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage	V _F	I _F =16mA	—	1.7	1.95	V
	Reverse current	I _R	V _R =5V	—	—	10	μA
	Terminal capacitance	C _t	V _F =0V, f=1MHz	—	60	250	pF
Output	High level output current (1)	I _{OH(1)}	I _F =0, V _{CC} =5.5V, V _O =5.5V	—	3	500	nA
	High level output current (2)	I _{OH(2)}	I _F =0, V _{CC} =15V, V _O =15V	—	—	1.0	μA
	*6 High level output current (3)	I _{OH(3)}	I _F =0, V _{CC} =15V, V _O =15V	—	—	50	μA
	High level supply current (1)	I _{CCH(1)}	I _F =0, V _{CC} =15V, V _O =open	—	0.02	1.0	μA
	*6 High level supply current (2)	I _{CCH(2)}	I _F =0, V _{CC} =15V, V _O =open	—	—	2.0	μA
	Low level supply current	I _{CCL}	I _F =16mA, V _{CC} =15V, V _O =open	—	120	—	μA
	Low level output voltage	V _{OL}	I _F =16mA, V _{CC} =4.5V, I _O =2.4mA	—	—	0.4	V
Transfer characteristics	Current transfer ratio (1)	CTR (1)	I _F =16mA, V _{CC} =4.5V, V _O =0.4V	19	—	50	%
	*6 Current transfer ratio (2)	CTR (2)	I _F =16mA, V _{CC} =4.5V, V _O =0.4V	15	—	—	%
	*7 "High→Low" propagation delay time	t _{PHL}	I _F =16mA, V _{CC} =5V R _L =1.9kΩ	—	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	I _F =0, R _L =1.9kΩ V _{CC} =5V, V _{CM} =1.0kV _(p-p)	15	30	—	kV/μs
	*8 Instantaneous common mode rejection voltage "Output : Low level"	CM _L	I _F =16mA, R _L =1.9kΩ V _{CC} =5V, V _{CM} =1.0kV _(p-p)	-15	-30	—	kV/μs
	Isolation resistance	R _{ISO}	DC=500V, 40 to 60% RH	5×10 ¹⁰	1×10 ¹¹	—	Ω
Floating capacitance	C _f	V=0, f=1MHz	—	0.6	1.0	pF	

*6 T_a=0 to 70°C

*7 Refer to Fig.1

*8 Refer to Fig.2

Fig.1 Test Circuit for Propagation Delay Time

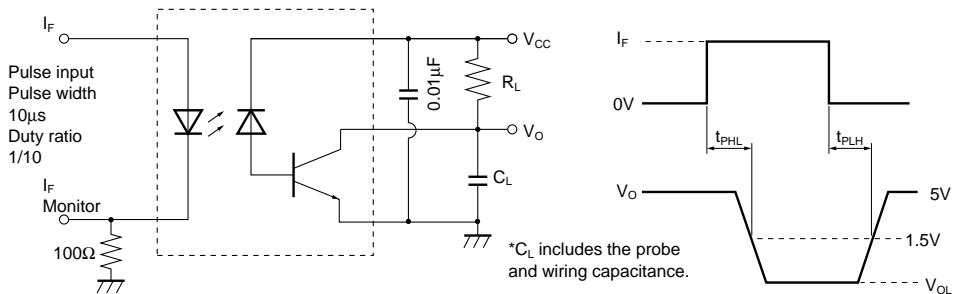


Fig.2 Test Circuit for Instantaneous Common Mode Rejection Voltage

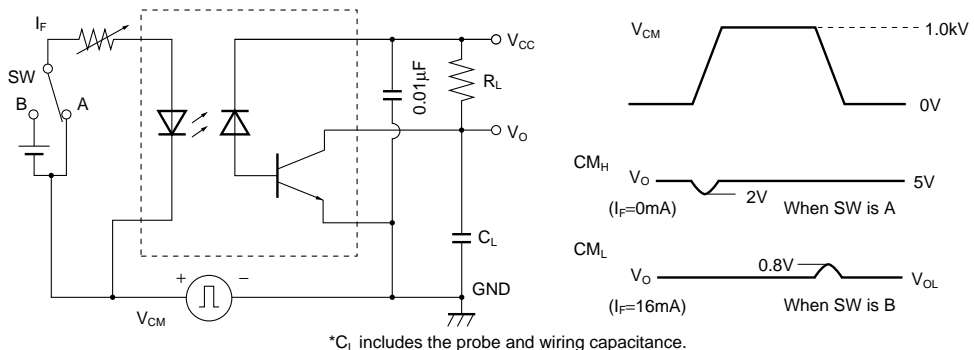


Fig.3 Forward Current vs. Ambient Temperature

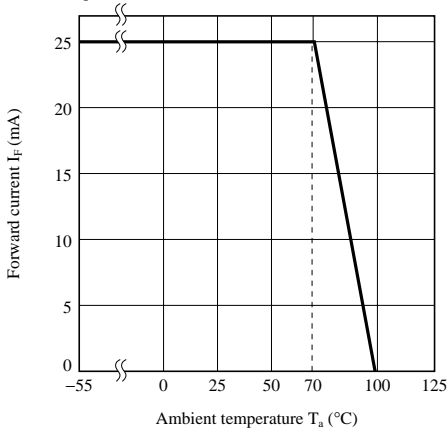


Fig.4 Power Dissipation vs. Ambient Temperature

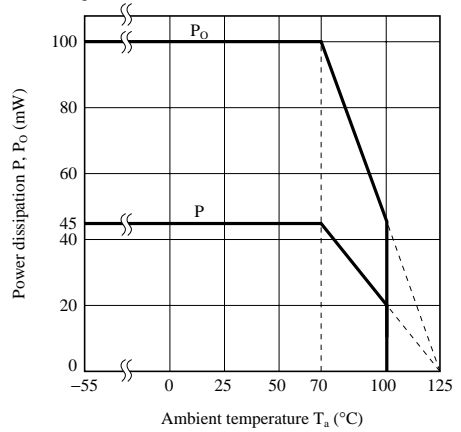


Fig.5 Forward Current vs. Forward Voltage

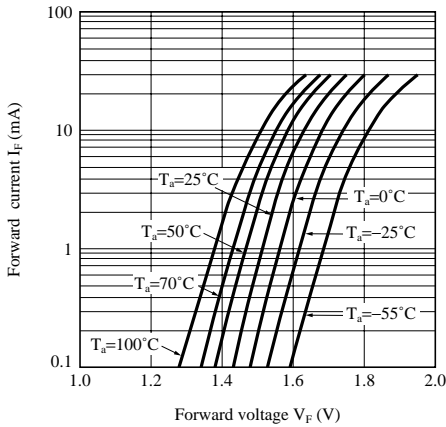


Fig.6 Relative Current Transfer Ratio vs. Forward Current

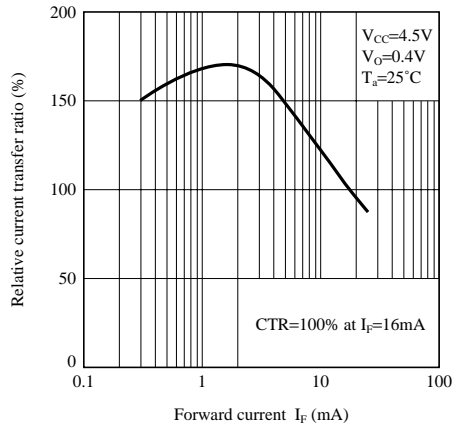


Fig.7 Output Current vs. Output Voltage

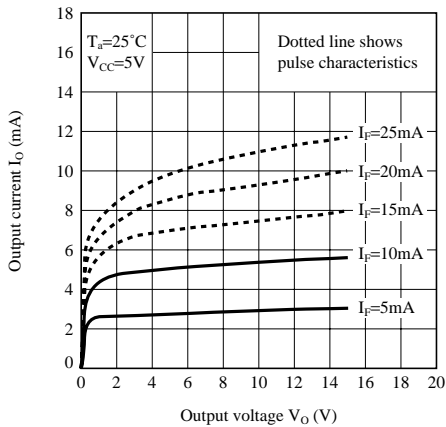


Fig.8 Relative Current Transfer Ratio vs. Ambient Temperature

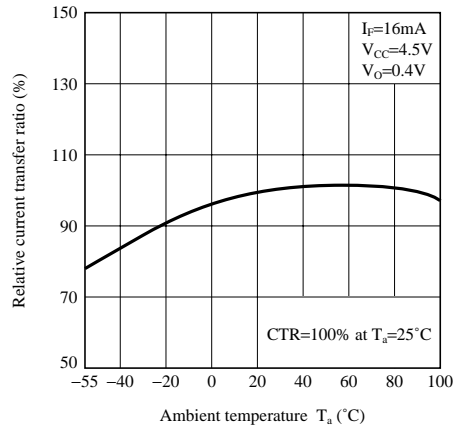


Fig.9 High Level Output Current vs. Ambient Temperature

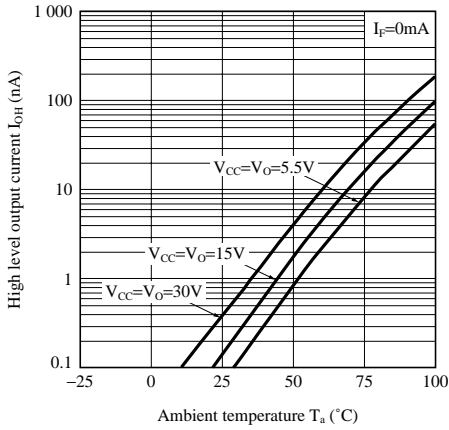
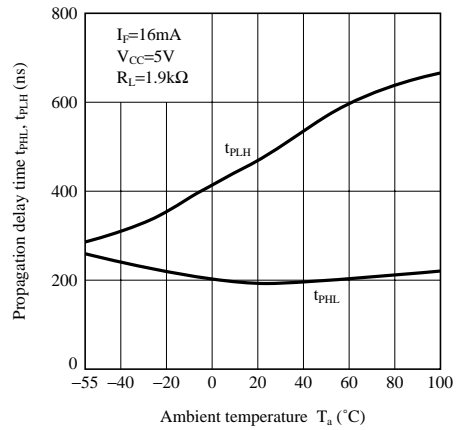


Fig.10 Propagation Delay Time vs. Ambient Temperature



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