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
	*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		$V_{iso\ (rms)}$	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
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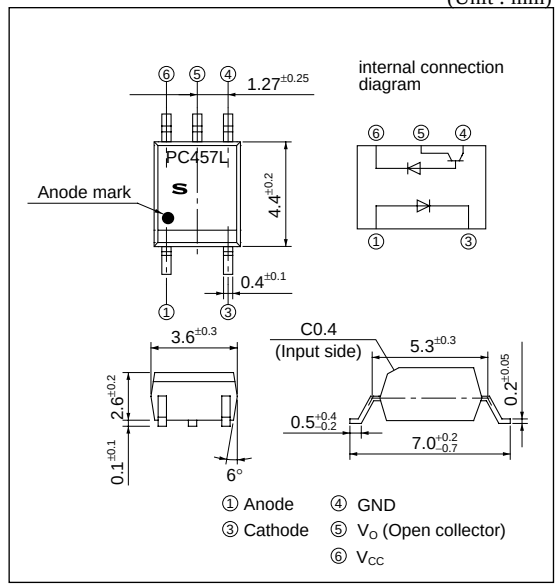
*4 40 to 60%RH, AC for 1minute
*5 For 10s

■ 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=1.9Ω	–	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	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

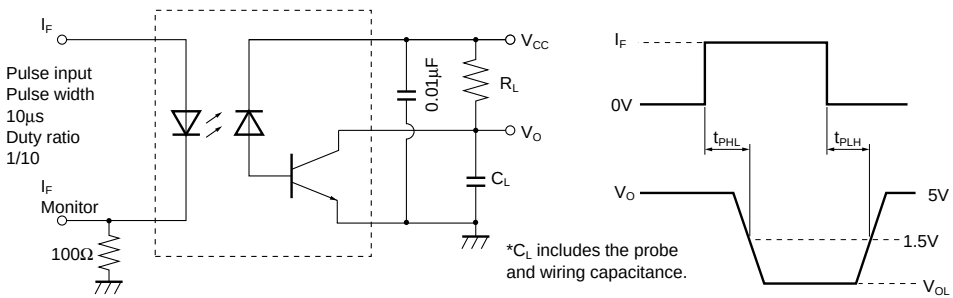


Fig.2 Test Circuit for Instantaneous Common Mode Rejection Voltage

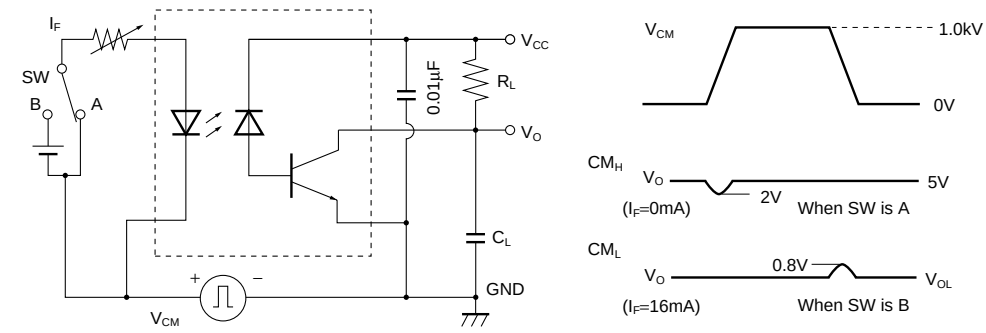


Fig.3 Forward Current vs. Ambient Temperature

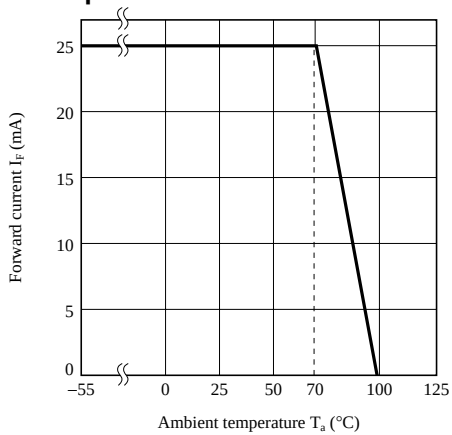


Fig.4 Power Dissipation vs. Ambient Temperature

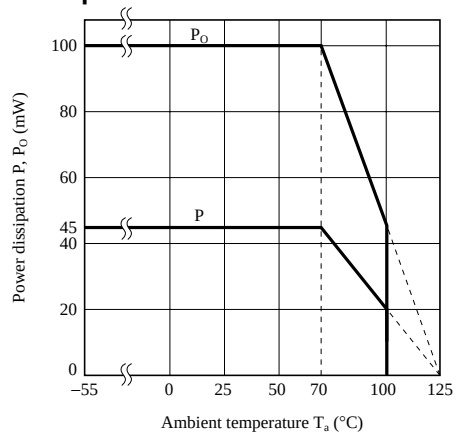


Fig.5 Forward Current vs. Forward Voltage

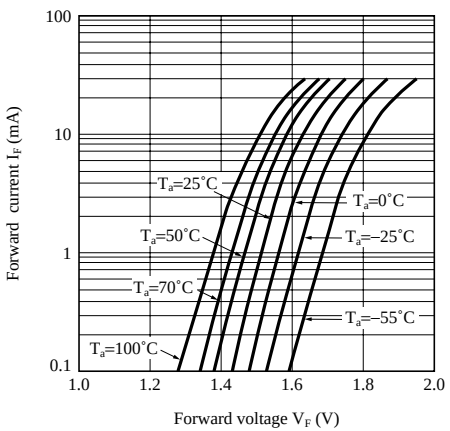


Fig.6 Relative Current Transfer Ratio vs. Forward Current

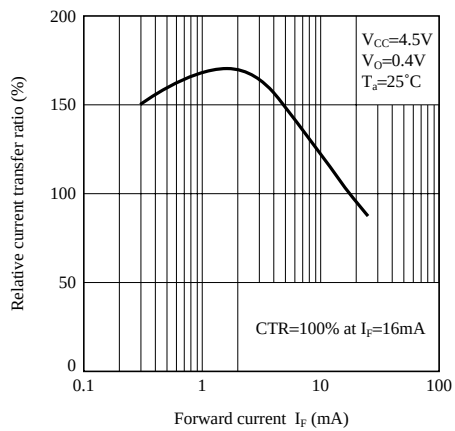


Fig.7 Output Current vs. Output Voltage

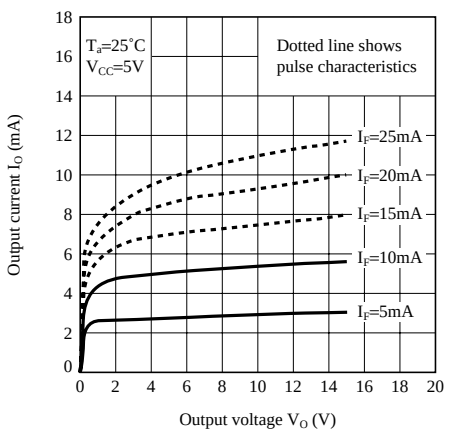


Fig.8 Relative Current Transfer Ratio vs. Ambient Temperature

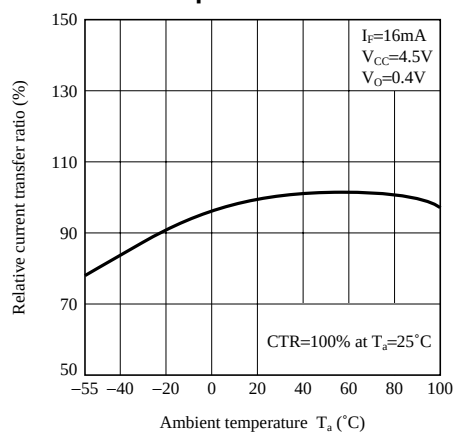


Fig.9 High Level Output Current vs. Ambient Temperature

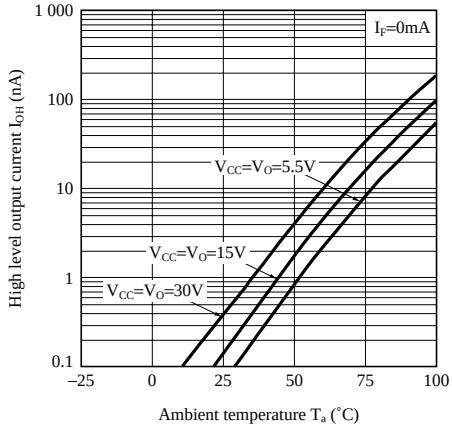
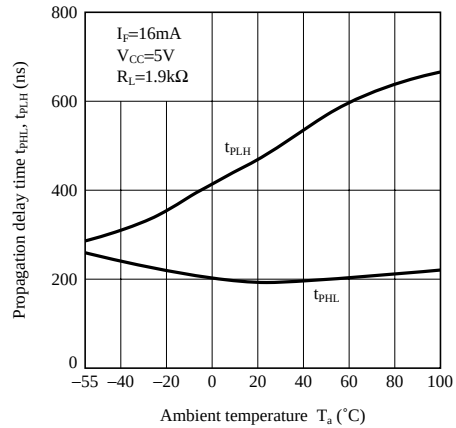


Fig.10 Propagation Delay Time vs. Ambient Temperature



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  --- Office automation equipment
  --- Telecommunication equipment [terminal]
  --- Test and measurement equipment
  --- Industrial control
  --- Audio visual equipment
  --- Consumer electronics

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  --- Traffic signals
  --- Gas leakage sensor breakers
  --- Alarm equipment
  --- Various safety devices, etc.

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  --- Telecommunication equipment [trunk lines]
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