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

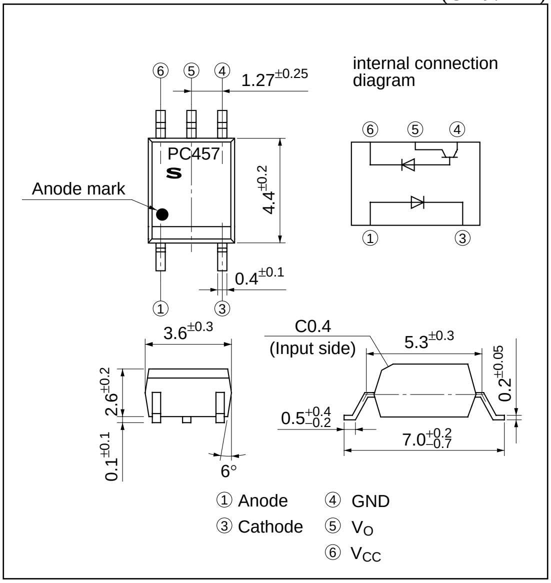
(Ta=25°C)

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

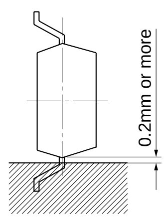
*1 When ambient temperature goes above 70°C, the power dissipation goes down at 0.45mA/°C.
*2 When ambient temperature goes above 70°C, the power dissipation goes down at 0.8mA/°C.
*3 When ambient temperature goes above 70°C, the power dissipation goes down at 1.8mA/°C.
*4 40 to 60%RH, AC for 1 min
*5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



Soldening area

■ Electro-optical Characteristics

(Unless otherwise specified Ta=0 to +70˚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=0mA, V_{CC}=5.5V, V_O=5.5V	–	3	500	nA
	High level output current (2)	$I_{OH\ (2)}$	I_F=0mA, V_{CC}=15V, V_O=15V	–	–	1.0	μA
	*6 High level output current (3)	$I_{OH\ (3)}$	I_F=0mA, V_{CC}=15V, V_O=15V	–	–	50	μA
	High level supply current (1)	$I_{CCH\ (1)}$	I_F=0mA, V_{CC}=15V, V_O=open	–	0.02	1.0	μA
	*6 High level supply current (2)	$I_{CCH\ (2)}$	I_F=0mA, V_{CC}=15V, V_O=open	–	–	2.0	μA
	Low level supply current	I_{CCL}	I_F=16mA, V_{CC}=15V, V_O=open	–	200	–	μA
	Low level output voltage	V_{OL}	I_F=16mA, V_{CC}=4.5V, I_O=2.4mA	–	–	0.4	V
Transfer charac-teristics	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=0mA, R_L=1.9kΩ V_{CC}=5V, $V_{CM\ (p-p)}$=1.0kV	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, $V_{CM\ (p-p)}$=1.0kV	–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=0V, f=1MHz	–	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

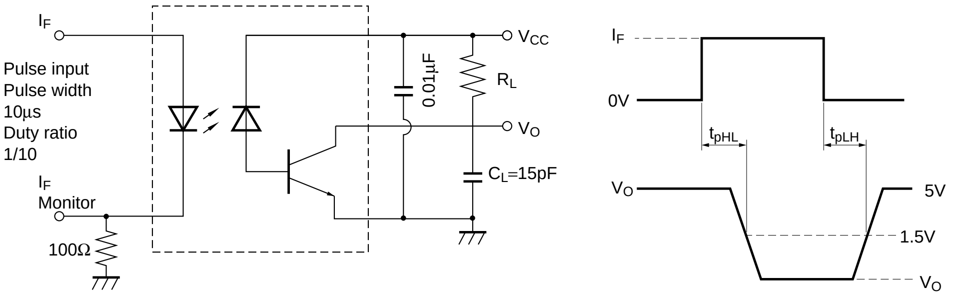


Fig.2 Test Circuit for Instantaneous Common Mode Rejection Voltage

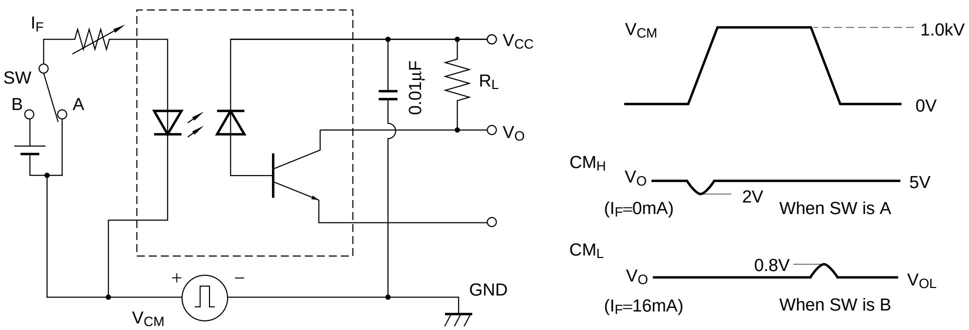


Fig.3 Forward Current vs. Ambient Temperature

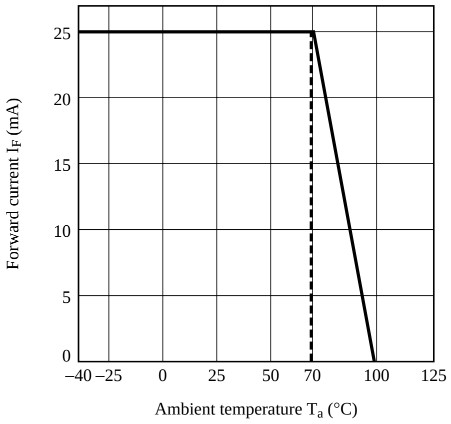
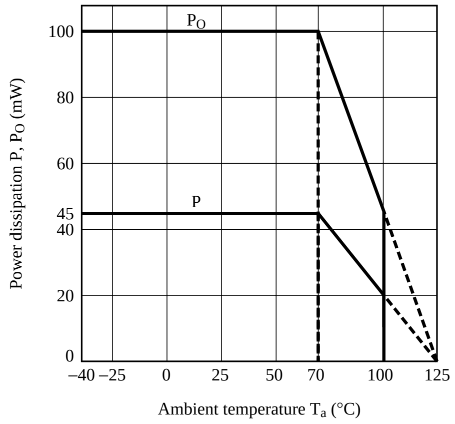


Fig.4 Power Dissipation vs. Ambient Temperature



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  - Consumer electronics

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  - Alarm equipment
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