

PC924

OPIC Photocoupler for IGBT Drive of Inverter

※ Lead forming type (I type) and taping reel type (P type) are also available. (PC924I/PC924P)

※※ TÜV (VDE 0884) approved type is also available as an option.

■ Features

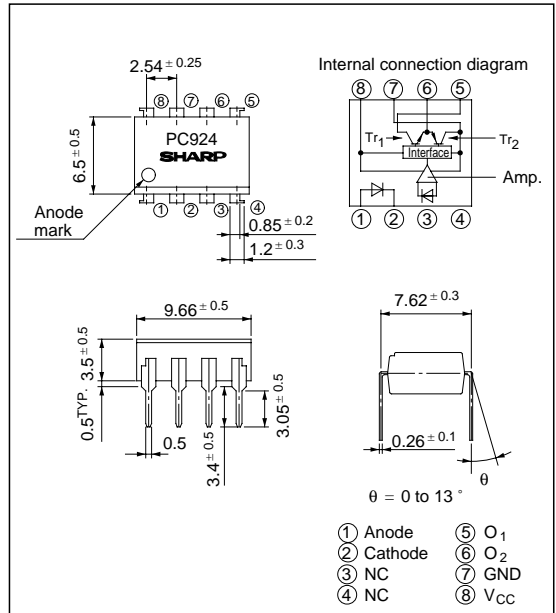
1. Built-in direct drive circuit for IGBT drive
(I_{O1P} , I_{O2P} : 0.4A)
2. High speed response (t_{PLH} , t_{PHL} : MAX. 2.0 μ s)
3. Wide operating supply voltage range
(V_{CC} : 15 to 30V at $T_a = -10$ to 60°C)
4. High noise resistance type
 CM_H : MIN. - 1 500V/ μ s
 CM_L : MIN. 1 500V/ μ s
5. High isolation voltage (V_{iso} : 5 000V_{rms})

■ Applications

1. IGBT drive for inverter control

■ 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.

■ Absolute Maximum Ratings

(Unless specified, $T_a = T_{opr}$)

	Parameter	Symbol	Rating	Unit
Input	Forward current	I_F	25	mA
	Reverse voltage	V_R	6	V
	Supply voltage	V_{CC}	35	V
Output	O_1 output current	I_{O1}	0.1	A
	*1 O_1 peak output current	I_{O1P}	0.4	A
	O_2 output current	I_{O2}	0.1	A
	*1 O_2 peak output current	I_{O2P}	0.4	A
	O_1 output voltage	V_{O1}	35	V
	Power dissipation	P_O	500	mW
	Total power dissipation	P_{tot}	550	mW
	*2 Isolation voltage	V_{iso}	5 000	V _{rms}
Operating temperature	T_{opr}	- 25 to + 80	°C	
Storage temperature	T_{stg}	- 55 to + 125	°C	
*3 Soldering temperature	T_{sol}	260	°C	

*1 Pulse width \leq 0.15 μ s,

Duty ratio : 0.01

*2 40 to 60% RH, AC for 1 minute, $T_a = 25^\circ$ C

*3 For 10 seconds

■ Electro-optical Characteristics

(Ta = T_{opr} unless otherwise specified)

Parameter		Symbol	*4 Conditions	MIN.	TYP.	MAX.	Unit	Fig.			
Input	Forward voltage	V _{F1}	Ta = 25°C, I _F = 20mA	-	1.2	1.4	V	-			
		V _{F2}	Ta = 25°C, I _F = 0.2mA	0.6	0.9	-	V	-			
	Reverse current	I _R	Ta = 25°C, V _R = 4V	-	-	10	μA	-			
	Terminal capacitance	C _t	Ta = 25°C, V = 0, f = 1kHz	-	30	250	pF	-			
Output	Operating supply voltage	V _{CC}	Ta = -10 to 60°C	15	-	30	V	-			
				15	-	24	V				
	O ₁ low level output voltage	V _{O1L}	V _{CC1} = 12V, V _{CC2} = -12V I _{O1} = 0.1A, I _F = 10mA	-	0.2	0.4	V	1			
	O ₂ high level output voltage	V _{O2H}	V _{CC} = V _{O1} = 24V, I _{O2} = 0.1A, I _F = 10mA	18	21	-	V	2			
	O ₂ low level output voltage	V _{O2L}	V _{CC} = 24V, I _{O2} = 0.1A, I _F = 0	-	1.2	2.0	V	3			
	O ₁ leak current	I _{O1L}	Ta = 25°C, V _{CC} = V _{O1} = 35V, I _F = 0	-	-	500	μA	4			
	O ₂ leak current	I _{O2L}	Ta = 25°C, V _{CC} = V _{O2} = 35V, I _F = 10mA	-	-	500	μA	5			
	High level supply current	I _{CCH}	Ta = 25°C, V _{CC} = 24V, I _F = 10mA	-	6	10	mA	6			
			V _{CC} = 24V, I _F = 10mA	-	-	14	mA				
	Low level supply current	I _{CCL}	Ta = 25°C, V _{CC} = 24V, I _F = 0	-	8	13	mA	6			
V _{CC} = 24V, I _F = 0			-	-	17	mA					
Transfer characteristics	*5 “Low→High” threshold input current	I _{FLH}	Ta = 25°C, V _{CC} = 24V	1.0	4.0	7.0	mA	7			
			V _{CC} = 24V	0.6	-	10.0	mA				
	Isolation resistance	R _{ISO}	Ta = 25°C, DC = 500V, 40 to 60% RH	5 x 10 ¹⁰	10 ¹¹	-	Ω	-			
	Response time			Ta = 25°C, V _{CC} = 24V, I _F = 10mA R _C = 47Ω, C _G = 3,000pF	“Low→High” propagation delay time	t _{PLH}	-	1.0	2.0	μs	8
					“High→Low” propagation delay time	t _{PHL}	-	1.0	2.0	μs	
					Rise time	t _r	-	0.2	0.5	μs	
					Fall time	t _f	-	0.2	0.5	μs	
	Instantaneous common mode rejection voltage “Output : High level”	CM _H	Ta = 25°C, V _{CM} = 600V(peak) I _F = 10mA, V _{CC} = 24V, ΔV _{O2H} = 2.0V	-	-30	-	kV/μs	9			
Instantaneous common mode rejection voltage “Output : Low level”				CM _L	Ta = 25°C, V _{CM} = 600V(peak) I _F = 0, V _{CC} = 24V, ΔV _{O2L} = 2.0V	-	30		-	kV/μs	

*4 When measuring output and transfer characteristics, connect a by-pass capacitor (0.01 μF or more) between V_{CC} and GND near the device.

*5 I_{FLH} represents forward current when output goes from “ Low ” to “ High ” .

■ Truth Table

Input	O ₂ Output	Tr. 1	Tr. 2
ON	High level	ON	OFF
OFF	Low level	OFF	ON