PC912L0NSZ

High Speed Response , High CMR*OPIC Photocoupler

■ Features

1. High speed response. (Data transfer rate:25Mbps)
2. High resistance to noise due to high common rejection voltage. (CMR:MIN. 20kV/µs)
3. Isolation voltage between input and output. ($V_{iso\ (rms)}$:5.0kV)
4. 8-pin DIP package.

■ Applications

1. FA equipment.

■ Absolute Maximum Ratings

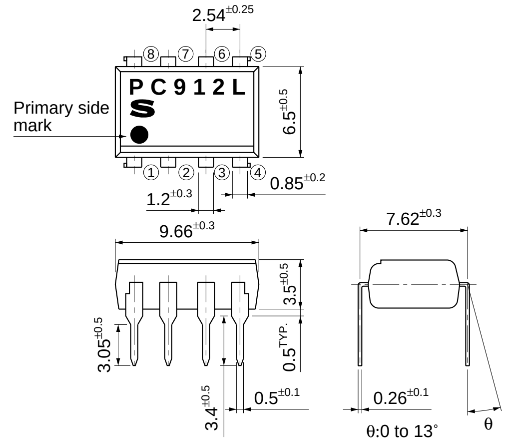
(T_a=25°C)

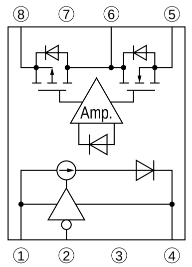
Parameter		Symbol	Rating	Unit
Input	Supply voltage	V_{CC1}	0 to 5.5	V
	Input voltage	V_{IN}	–0.5 to V_{CC1}+0.5	V
Output	Supply voltage	V_{CC2}	0 to 5.5	V
	High level output voltage	V_O	–0.5 to V_{CC2}+0.5	V
	Low level output current	I_O	10	mA
*1 Isolation voltage		$V_{iso\ (rms)}$	5.0	kV
Operating temperature		T_{opr}	–40 to +85	°C
Storage temperature		T_{stg}	–55 to +125	°C
*2 Soldering temperature		T_{sol}	270	°C

*1 40 to 60%RH, AC for 1minute
*2 For 10s

■ Outline Dimensions

(Unit : mm)





① V_{CC1} ⑤ GND2
② V_{IN} ⑥ V_O
*3 ③ N.C. ⑦ N.C.
④ GND1 ⑧ V_{CC2}

*3 Pin ③ isnot allowed external connection

* "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 $T_a=T_{opr}$)

Parameter			Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Low level supply current		I_{CC1L}	V_{IN}=0V	−	6.0	10.0	mA
	High level supply current		I_{CC1H}	$V_{IN}=V_{CC1}$	−	1.5	3.0	mA
	Input current		I_{IN}	−	−10	−	10	μA
Output	High level supply current		I_{CC2H}	−	−	7.0	9.0	mA
	Low level supply current		I_{CC2L}	−	−	5.5	9.0	mA
	High level output voltage		V_{OH}	I_O=−20μA, $V_{IN}=V_{IH}$	4.4	5.0	−	V
				I_O=−4mA, $V_{IN}=V_{IH}$	4.0	4.8	−	V
	Low level output voltage		V_{OL}	I_O=20μA, $V_{IN}=V_{IL}$	−	0	0.1	V
				I_O=400μA, $V_{IN}=V_{IL}$	−	−	0.1	V
				I_O=4mA, $V_{IN}=V_{IL}$	−	0.5	1.0	V
Transfer charac-teristics	Isolation resistance		R_{ISO}	DC=500V, 40 to 60%RH	5×10^{10}	10^{11}	−	Ω
	Response time	"High→Low" propagation delay time	t_{PHL}	$V_{CC1}=V_{CC2}$=5V C_L=15pF, CMOS Logic level V_{IN}=0→5V $t_r=t_f$<1ns Pulse width 40ns Duty 50%	−	20	40	ns
		"Low→High" propagation delay time	t_{PLH}		−	23	40	ns
		Pulse width distortion $\lvert t_{pHL}-t_{pLH}\rvert$	Δtw		−	−	6	ns
		Propagation delay time	T_{PSK}		−	−	20	ns
		Data transfer rate	T		−	−	25	Mb/s
		Rise time	t_r		−	9	−	ns
		Fall time	t_f		−	8	−	ns
	Instantaneous common mode rejection voltage "Output : High level"		CM_H	$V_{IN}=V_{CC1}$, $V_O>0.8\times V_{CC2}$ V_{CM}=1kV	20	−	−	kV/μs
	Instantaneous common mode rejection voltage "Output : Low level"		CM_L	V_{IN}=0, V_O>0.8 V_{CM}=1kV	−20	−	−	kV/μs

When measuring output and transfer characteristics, connect a by-pass capacitor (0.1μF or more) between V_{CC1} ① and GND_1 ④, between V_{CC2} ⑧ and GND_2 ⑤ near the device
Pulse width distortion $\Delta t_W=\lvert t_{PHL}-t_{PLH}\rvert$
All typical values:at T_a=25˚C, $V_{CC1}=V_{CC2}$=5V

■ Recommended Operating Conditions

(T_a=25°C)

Parameter	Symbol	MIN.	MAX.	Unit
Supply voltage	V_{CC1}	4.5	5.5	V
Supply voltage	V_{CC2}	4.5	5.5	V
High level input voltage	V_{IH}	2.0	V_{CC1}	V
Low level input voltage	V_{IL}	0.0	0.8	V
Operating temperature	T_{opr}	−40	+85	°C

■ Truth Table

Input	LED	Output
H	OFF	H
L	ON	L

L:Logic (0)
H:Logic (1)

Fig.1 Test Circuit for t_{PHL}, t_{PLH}, t_r and t_f

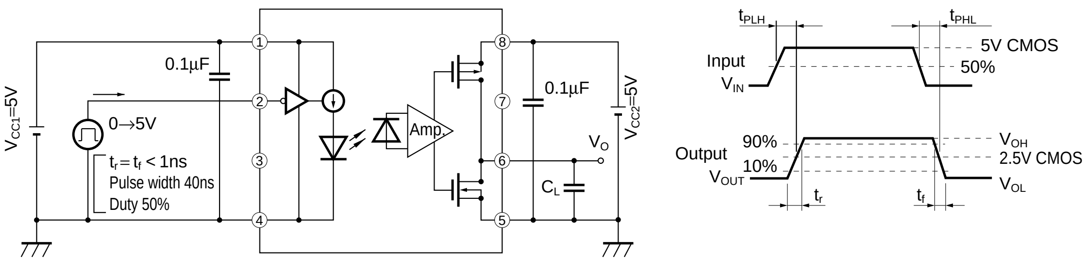


Fig.2 Test Circuit for CM_H and CM_L

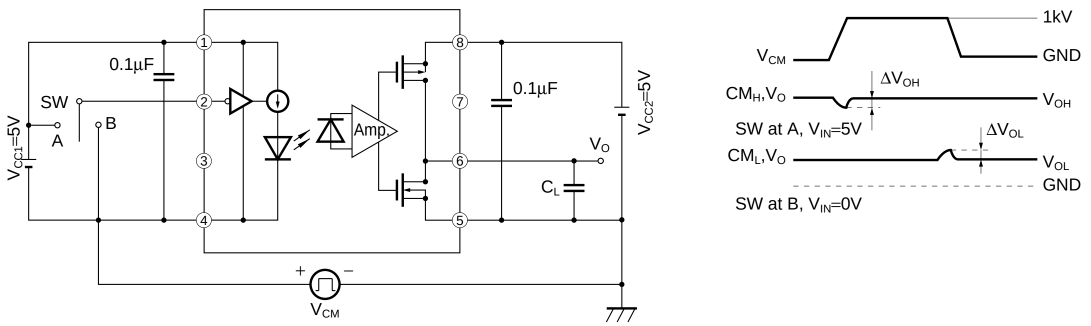


Fig.3 Propagation Delay Time vs. Ambient Temperature

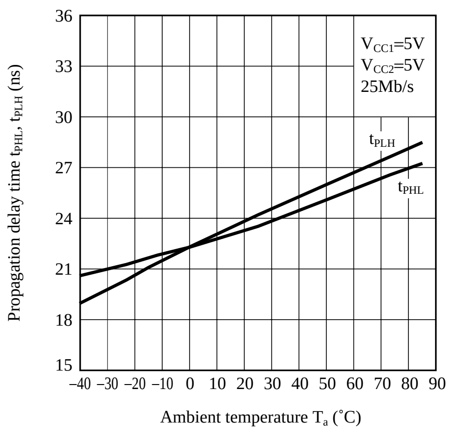


Fig.4 Pulse Width Distortion vs. Ambient Temperature

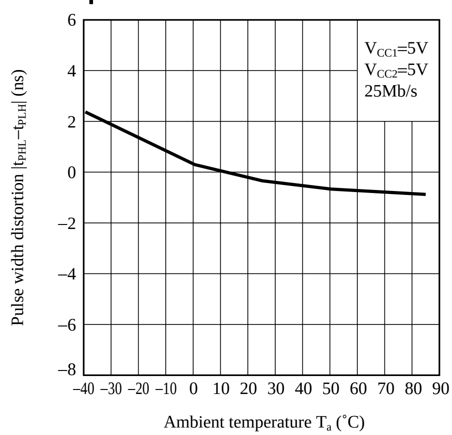
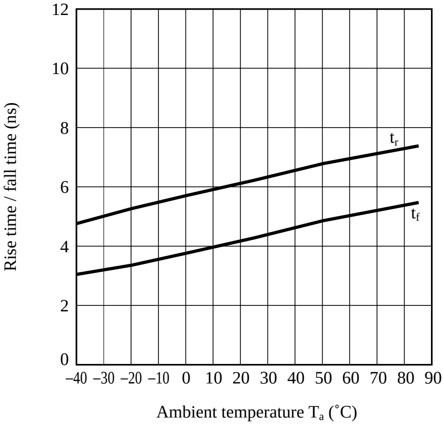


Fig.5 Rise time / fall time vs. Ambient Temperature



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  --- Office automation equipment
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  --- Consumer electronics

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  --- Alarm equipment
  --- Various safety devices, etc.

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