SHARP

Under development	
New product	●

PC910L0NSZ

Photocoupler

Ultra-High Speed Response,High CMR *OPIC Photocoupler

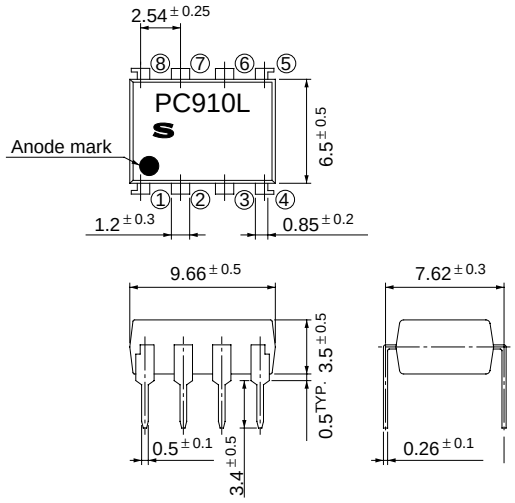
■ Features

(1) High instantaneous common mode rejection voltage (CMR: MIN.10kV/μs)
(2) High speed response(TYP.10Mbps)
(3) Isolation voltage (V_{iso}(rms):5.0kV)
(4) 8-pin DIP package
(5) Flow soldering : 280˚C for 6s or less
(6) Recognized by UL (file No. E64380)
Under preparation for VDE standard

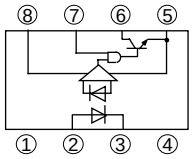
■ Applications

(1) Programmable controllers
(2) Inverters

■ Outline Dimensions



Internal connection diagram



① NC ⑤ GND
② Anode ⑥ V_O (Open Collector)
③ Cathode ⑦ V_E (Enable)
④ NC ⑧ V_{CC}

* "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

T_a=25°C

Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	20	mA
	Reverse voltage	V_R	5	V
	Power dissipation	P	40	mW
Output	Supply voltage	V_{CC}	7	V
	*1 Enable voltage	V_E	5.5	V
	High level output voltage	V_{OH}	7	V
	Low level output current	I_{OL}	50	mA
	Collector power dissipation	P_C	85	mW
*2 Isolation voltage		$V_{iso(rms)}$	5.0	kV
Operating temperature		T_{opr}	-40 to +85	°C
Storage temperature		T_{stg}	-55 to +125	°C
*3 Soldering temperature		T_{sol}	270	°C

*1 V_E < V_{CC}+500mV
*2 40 to 60% RH, AC for 1 min
*3 For 10s at the portion of 0.2mm or more from the root of lead pins

Electro-optical Characteristics

(T_a=-40 to +85°C unless specified)

Parameter			Symbol	Condition		MIN.	TYP.	MAX.	Unit
Input	Forward voltage		V_F	T_a=25°C,I_F=10mA		-	1.6	1.9	V
	Reverse current		I_R	T_a=25°C,V_R=5V		-	-	10	μA
	Terminal capacitance		C_t	T_a=25°C,V=0,f=1MHz		-	60	150	pF
Output	High level output current		I_{OH}	V_O=V_{CC}=5.5V,V_E=2.0V, I_F=250μA		-	0.02	100	μA
	Low level output voltage		V_{OL}	V_{CC}=5.5V,V_E=2.0V,I_F=5mA I_{OL}=13mA		-	0.4	0.6	V
	High level enable current		I_{EH}	V_{CC}=5.5V,V_E=2.0V		-	–0.5	–1.6	mA
	Low level enable curren		I_{EL}	V_{CC}=5.5V,V_E=0.5V		-	–0.7	–1.6	mA
	High level supply current		I_{CCH}	V_{CC}=5.5V,I_F=0mA,V_E=2.0V		-	5	10	mA
				V_{CC}=5.5V,I_F=0mA,V_E=0.5V		-	5	-	mA
	Low level supply current		I_{CCL}	V_{CC}=5.5V,I_F=10mA,V_E=2.0V		-	7	13	mA
				V_{CC}=5.5V,I_F=10mA,V_E=0.5V		-	5.5	-	mA
	"High→Low"threshold input current		I_{FHL}	V_{CC}=5V,V_E=2.0V,V_o=0.8V, R_L=350Ω		-	2.5	5	mA
Transfer charac-teristics	Isolation resistance		R_{ISO}	T_a=25°C,DC500V,40 to 60%RH		5×10^{10}	10^{11}	-	Ω
	Floating capacitance		C_f	T_a=25°C,V=0V,f=1MHz		-	0.6	5	pF
	Response time	"High→Low" propagation delay time	t_{PHL}	T_a=25°C,V_{CC}=5V,R_L=350Ω, C_L=15pF,I_F=7.5mA		25	48	75	ns
		"Low→High" propagation delay time	t_{PLH}			25	50	75	
		Fall time	t_r			-	10	-	
		Rise time	t_f			-	20	-	
		*4 Distortion of pulse width	Δt_w			-	-	35	
		"High→Low" enable propagation delay time	t_{EHL}	T_a=25°C,V_{CC}=5V,R_L=350Ω, C_L=15pF,I_F=7.5mA,V_{EH}=3V, V_{EL}=0.5V		-	15	-	
		"Low→High" enable propagation delay time	t_{ELH}			-	10	-	
	CMR	Instantaneous common mode rejection voltage (High level output)	CM_H	I_F=0mA, $V_{O(MIN.)}$=2V	T_a=25°C, V_{CC}=5V, V_{CM}=1k$V_{(P-P)}$, R_L=350Ω	10	20	-	kV/μs
		Instantaneous common mode rejection voltage (High level output)	CM_L	I_F=5mA, $V_{O(MAX.)}$=0.8V		–10	–20	-	

*4 Distortion of pulse width Δtw=| t_{PHL}-t_{PLH} |

In measuring output characteristics and transfer characteristics, connect a by-pass capacitor of 0.01μF or more between Vcc(Pin No. 8) and GND (Pin No. 5) near the device.

As of April 2001

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

  (ii) Measures such as fail-safe function and redundant design should be taken to ensure reliability and safety when SHARP devices are used for or in connection with equipment that requires higher reliability such as:
  --- Transportation control and safety equipment (i.e., aircraft, trains, automobiles, etc.)
  --- Traffic signals
  --- Gas leakage sensor breakers
  --- Alarm equipment
  --- Various safety devices, etc.

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  --- Space applications
  --- Telecommunication equipment [trunk lines]
  --- Nuclear power control equipment
  --- Medical and other life support equipment (e.g., scuba).

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