PC917X/PC918X

High Speed, High CMR OPIC Photocoupler

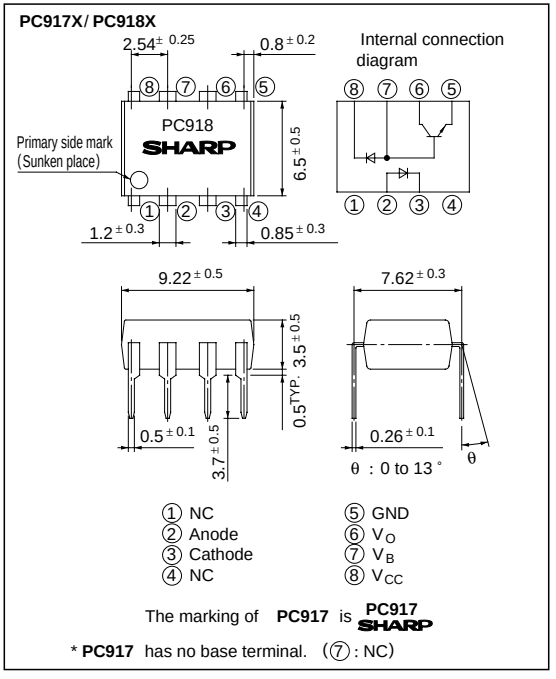
■ Features

1. High speed response
   (t_{PHL}, t_{PLH} : TYP. 0.3 μs at R_L = 1.9kΩ)
2. High instantaneous common mode rejection voltage
   (CM_H : TYP. 1kV/μs)
3. Standard dual-in-line package
4. Recognized by UL, file No. E64380

■ Applications

1. Computers, measuring instruments, controllers
2. High speed line receivers high speed logic
3. Switing regulators
4. Signal transmission between circuits of different potentials and impedances

■ 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.

■ Absoulte Maximum Ratings (Ta= 25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	25	mA
	Reverse voltage	V_R	5	V
	Power dissipation	P	45	mW
Output	Supply voltage	V_{CC}	- 0.5 to + 15	V
	Output voltage	V_O	- 0.5 to + 15	V
	*1Emitter-base voltage	V_{EBO}	5	V
	Output current	I_O	8	mA
	Power dissipation	P_O	100	mW
*2Isolation voltage		V_{iso}	2 500	V_{rms}
Operating temperature		T_{opr}	- 55 to + 100	°C
Storage temperature		T_{stg}	- 55 to + 125	°C
*3Soldering temperature		T_{sol}	260	°C

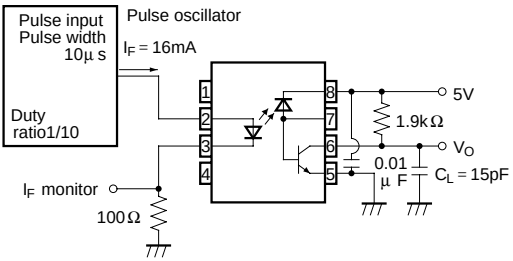
*1 Voltage between pin 5 and pin 7 (applies to **PC918X**)
*2 40 to 60% RH, AC for 1 minute
*3 For 10 seconds

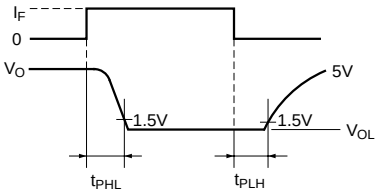
■ Electro-optical Characteristics

(Unless otherwise specified, Ta = 0 to + 70˚C)

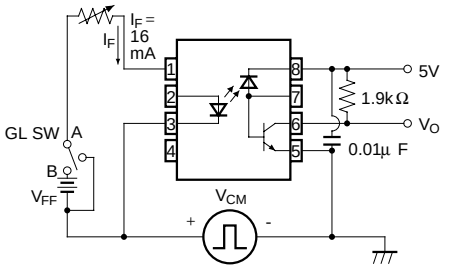
	Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage	V_F	Ta = 25˚C, I_F = 16mA	-	1.7	1.95	V
	Reverse current	I_R	Ta = 25˚C, V_R = 5V	-	-	10	μA
	Terminal capacitance	C_t	Ta = 25˚C, V_F = 0, f = 1MHz	-	60	250	pF
Output	High level output current (1)	$I_{OH(1)}$	Ta = 25˚C, I_F = 0, V_{CC} = V_O = 5.5V	-	3	500	nA
	High level output current (2)	$I_{OH(2)}$	Ta = 25˚C, I_F = 0, V_{CC} = V_O = 15V	-	-	1	μA
	High level output current (3)	$I_{OH(3)}$	I_F = 0, V_{CC} = V_O = 15V	-	-	50	μA
	Low level output voltage	V_{OL}	I_F = 16mA, I_O = 2.4mA, V_{CC} = 4.5V	-	-	0.4	V
	Low level supply current	I_{CCL}	I_F = 16mA, V_O = open, V_{CC} = 15V	-	200	-	μA
	High level supply current (1)	$I_{CCH(1)}$	Ta = 25˚C, I_F = 0, V_O = open V_{CC} = 15V	-	0.02	1	μA
	High level supply current (2)	$I_{CCH(2)}$	I_F = 0, V_O = open, V_{CC} = 15V	-	-	2	μA
Transfer characteristics	Current transfer ratio	CTR	Ta = 25˚C, I_F = 16mA, V_O = 0.4V, V_{CC} = 4.5V	19	-	-	%
	Isolation resistance	R_{ISO}	Ta = 25˚C, DC500V, 40 to 60% RH	5×10^{10}	10^{11}	-	Ω
	Floating capacitance	C_f	Ta = 25˚C, V = 0, f = 1MHz	-	0.6	1	pF
	*4 "High→Low" propagation delay time	t_{PHL}	Ta = 25˚C, R_L = 1.9kΩ I_F = 16mA, V_{CC} = 5V	-	0.3	0.8	μs
	*4 "Low→High" propagation delay time	t_{PLH}	Ta = 25˚C, R_L = 1.9kΩ I_F = 16mA, V_{CC} = 5V	-	0.3	1.2	μs
	*5 Instantaneous common mode rejection voltage "Output : High level"	CM_H	Ta = 25˚C, I_F = 0, R_L = 1.9kΩ V_{CM} = 10Vp-p, V_{CC} = 5V	-	1 000	-	V/μs
	*5 Instantaneous common mode rejection voltage "Output : Low level"	CM_L	Ta = 25˚C, I_F = 16mA, R_L = 1.9kΩ V_{CM} = 10Vp-p, V_{CC} = 5V	-	- 1 000	-	V/μs

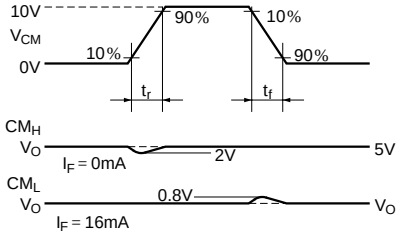
*4 Test Circuit for Propagation Delay Time (PC918X)





*5 Test Circuit for Instantaneous Common Mode Rejection Voltage (PC918X)





When the switch for infrared light emitting diode sets to A.

When the switch for infrared light emitting diode sets to B.

Fig. 1 Forward Current vs. Ambient Temperature

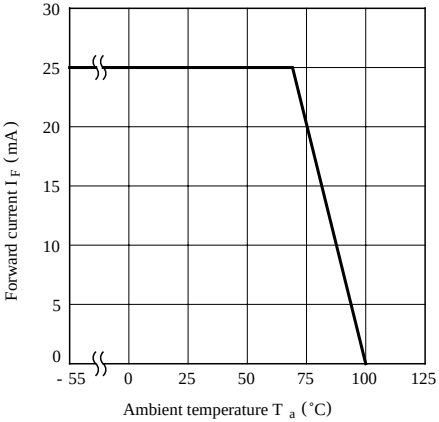


Fig. 2 Power Dissipation vs. Ambient Temperature

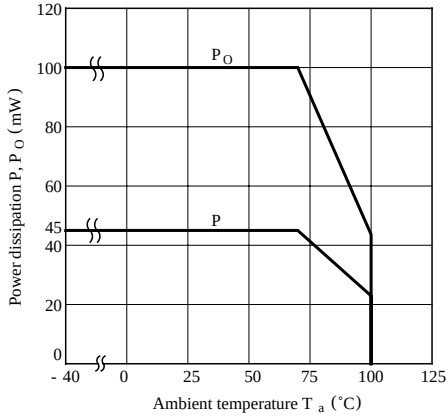


Fig. 3 Forward Current vs. Forward Voltage

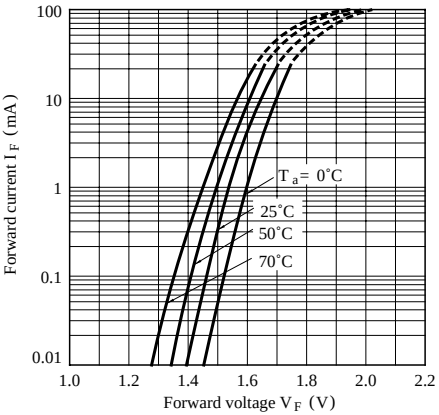


Fig. 4 Output Current vs. Output Voltage

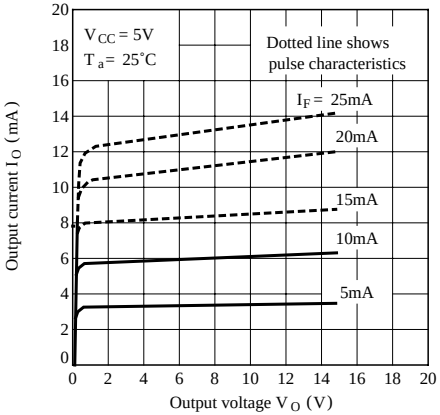


Fig. 5 Relative Current Transfer Ratio vs. Forward Current

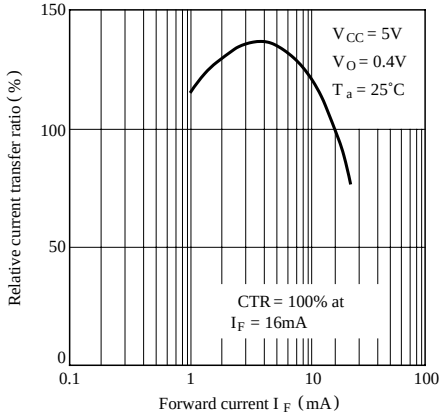


Fig. 6 Relative Current Transfer Ratio vs. Ambient Temperature

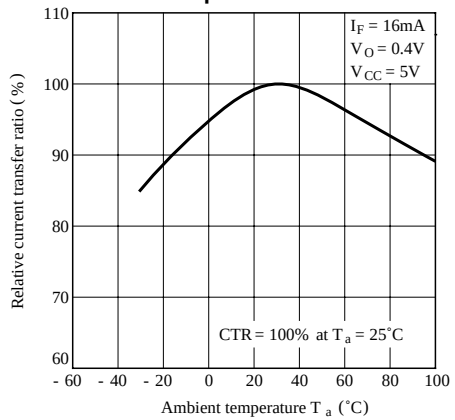


Fig. 7 Propagation Delay Time vs. Ambient Temperature

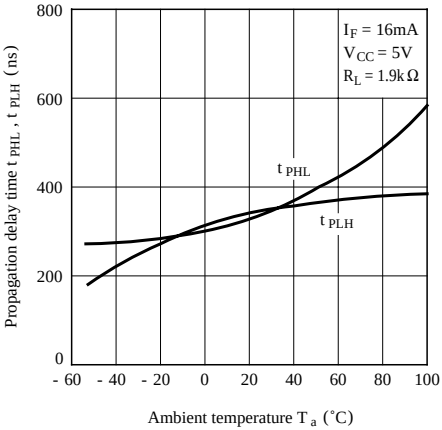


Fig. 8 High Level Output Current vs. Ambient Temperature

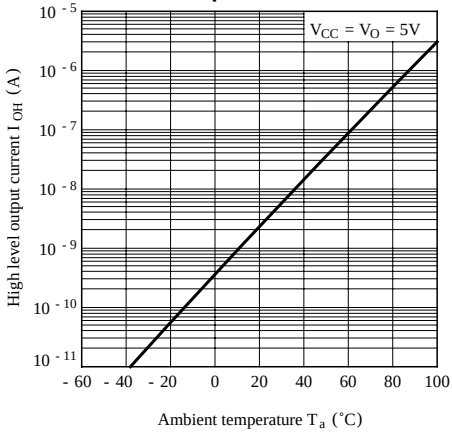
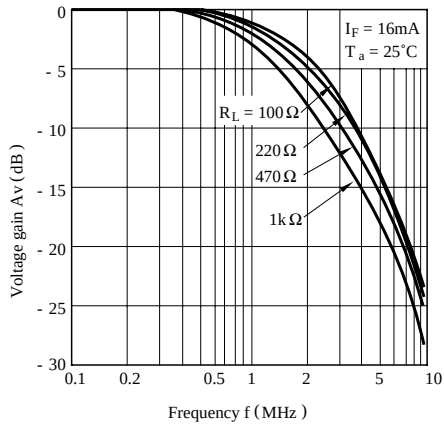
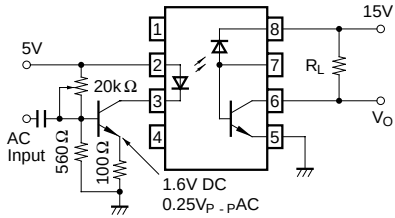


Fig. 9 Frequency Response



Test Circuit for Frequency Response (PC918X)



■ Precautions for Use

(1) It is recommended that a by-pass capacitor of more than 0.01μF is added between V_{CC} and GND near the device in order to stabilize power supply line.

(2) Transistor of detector side in bipolar configuration is apt to be affected by static electricity for its minute design. When handling them, general counterplan against static electricity should be taken to avoid breakdown of devices or degradation of characteristics.

(3) As for other general cautions, refer to the chapter "Precautions for Use".

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— Telecommunication equipment [terminal]
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— 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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