

PC904

Built-in Voltage Detection Circuit Type Photocoupler

※Lead forming type (I type) and taping reel type (P type) are also available. (**PC904I/PC904P**) (Page 656)

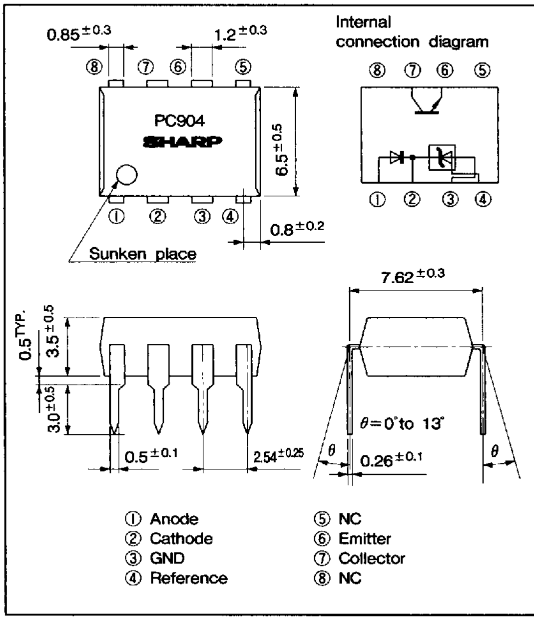
■ Features

1. Built-in voltage detection circuit
2. High isolation voltage between input and output (V_{iso} : 5 000V_{rms})
3. Standard 8-pin dual-in-line package
4. Recognizerd by UL, file No. E64380

■ Applications

1. Switching power supplies

■ Outline Dimensions (Unit : mm)



■ Absolute Maximum Ratings (Ta=25℃)

Parameter		Symbol	Rating	Unit
Input	Anode current	I_A	50	mA
	Anode voltage	V_A	30	V
	Reference input current	I_{REF}	10	mA
	Power dissipation	P	250	mW
Output	Collector-emitter voltage	V_{CEO}	35	V
	Emitter-collector voltage	V_{ECO}	6	V
	Collector current	I_C	50	mA
	Collector power dissipation	P_C	150	mW
Total power dissipation		P_{tot}	350	mW
*1Isolation voltage		V_{iso}	5 000	V_{rms}
Operating temperature		T_{opr}	−25 to +85	℃
Storage temperature		T_{stg}	−40 to +125	℃
*2Soldering temperature		T_{sol}	260	℃

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

■ Electro-optical Characteristics

(Ta=25℃)

	Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit	Fig.
Input	Reference voltage	V_{REF}	$V_K=V_{REF}$, $I_A=10mA$	2.40	2.495	2.60	V	1
	*3 Temperature change in reference voltage	$V_{REF(dev)}$	$V_K=V_{REF}$, $I_A=10mA$, Ta=-25 to +85℃	—	8	40	mV	1
	Voltage variation ratio in reference voltage	$\Delta V_{REF}/\Delta V_A$	$I_A=10mA$, $\Delta V_A=30V-V_{REF}$	—	-1.4	-5	mV/V	2
	Reference input current	I_{REF}	$I_A=10mA$, $R_3=10k\Omega$	—	2	10	μA	3
	*4 Temperature change in reference input current	$I_{REF(dev)}$	$I_A=10mA$, $R_3=10k\Omega$, Ta=-25 to +85℃	—	0.4	3	μA	3
	Minimum drive current	I_{MIN}	$V_K=V_{REF}$	—	1	2	mA	1
	OFF-state anode current	I_{OFF}	$V_A=30V$, $V_{REF}=GND$	—	0.1	2	μA	4
	Anode-cathode forward voltage	V_F	$V_K=V_{REF}$, $I_A=10mA$	—	1.2	1.4	V	1
Output	Collector dark current	I_{CEO}	$V_{CE}=35V$	—	1×10^{-9}	1×10^{-7}	A	5
Transfer characteristics	*5 Current transfer ratio	CTR	$V_K=V_{REF}$, $I_A=5mA$, $V_{CE}=5V$	50	—	600	%	6
	Collector-emitter saturation voltage	$V_{CE(sat)}$	$V_K=V_{REF}$, $I_A=10mA$, $I_C=1mA$	—	0.1	0.2	V	6
	Isolation resistance	R_{ISO}	40 to 60%RH, DC500V	5×10^{10}	1×10^{11}	—	Ω	—
	Floating capacitance	C_f	V=0, f=1kHz	—	0.6	1.0	pF	—

*3 $V_{REF(dev)}=V_{REF(MAX.)}-V_{REF(MIN.)}$
*4 $I_{REF(dev)}=I_{REF(MAX.)}-I_{REF(MIN.)}$
*5 $CTR=I_C/I_A\times100$ (%)

Classification table of current transfer ratio is shown below. (4 models)

Model No.	Rank mark	CTR (%)
PC904A	A	50 to 150
PC904B	B	100 to 300
PC904C	C	250 to 600
PC904	A, B or C	50 to 600

■ Test Circuit

Fig. 1

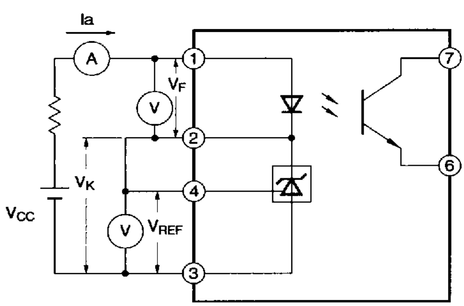


Fig. 2

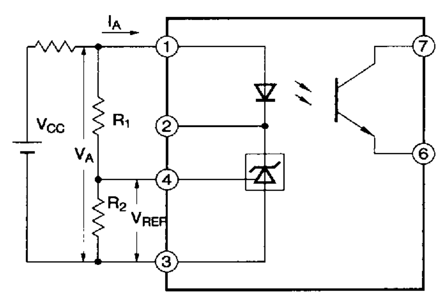


Fig. 3

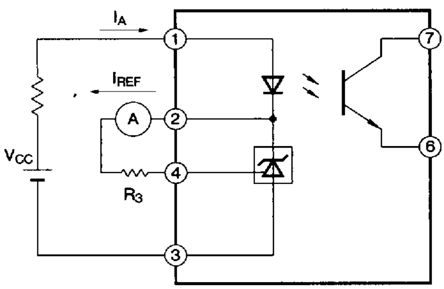


Fig. 4

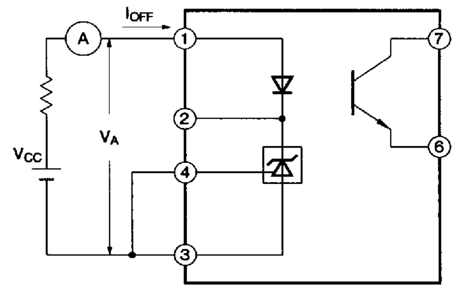


Fig. 5

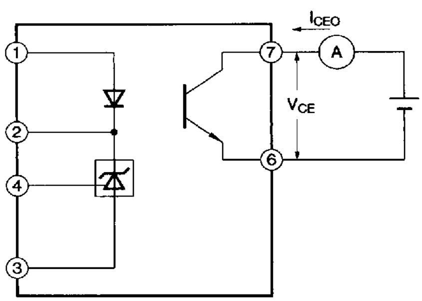


Fig. 6

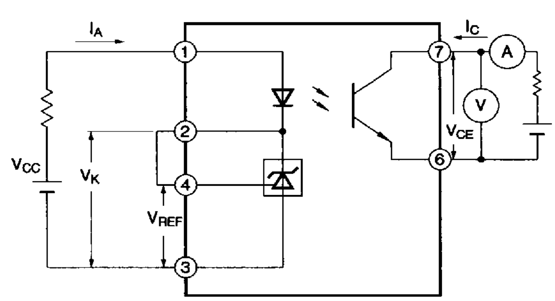


Fig. 7 Anode Current vs. Ambient Temperature

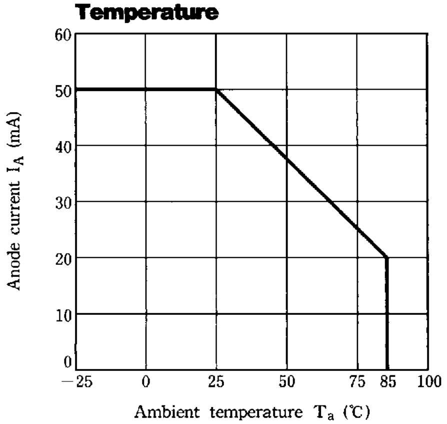


Fig. 8 Input Power Dissipation vs. Ambient Temperature

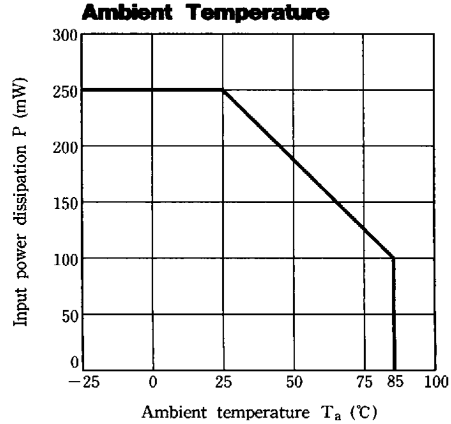


Fig. 9 Collector Power Dissipation vs. Ambient Temperature

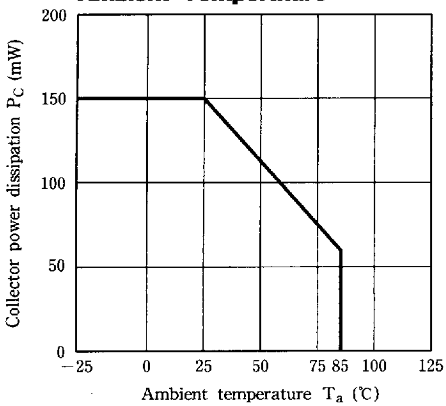


Fig.10 Power Dissipation vs. Ambient Temperature

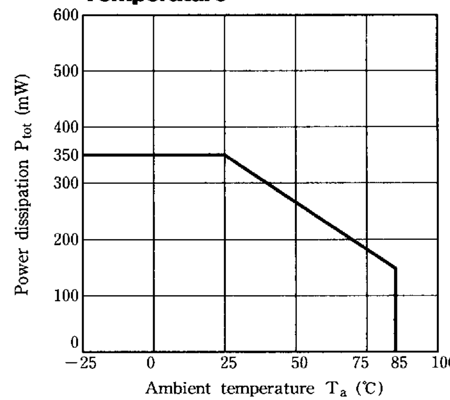


Fig.11 Relative Current Transfer Ratio vs. Ambient Temperature

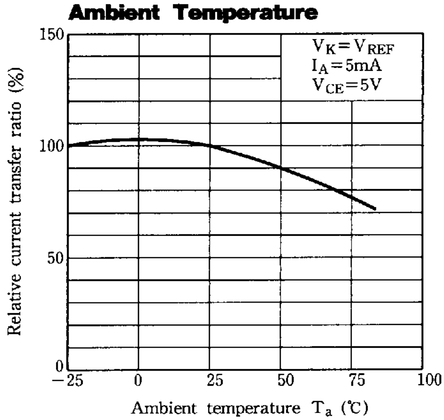


Fig.12 Collector Dark Current vs. Ambient Temperature

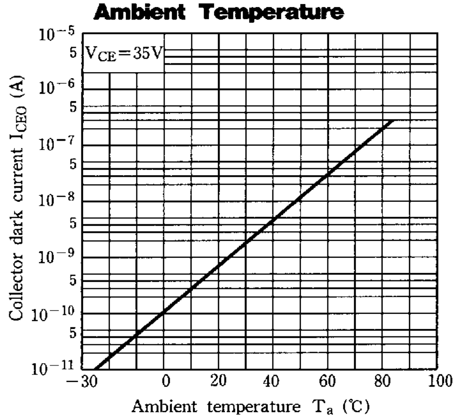


Fig.13-a Anode Current vs. Reference Voltage

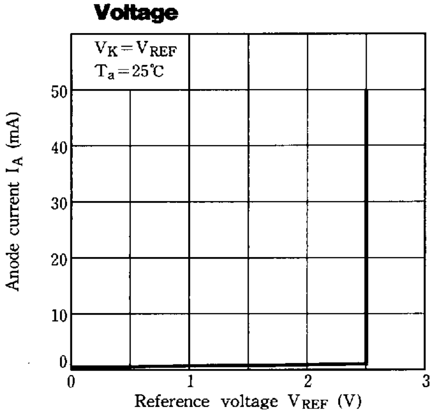


Fig.13-b Anode Current vs. Reference Voltage

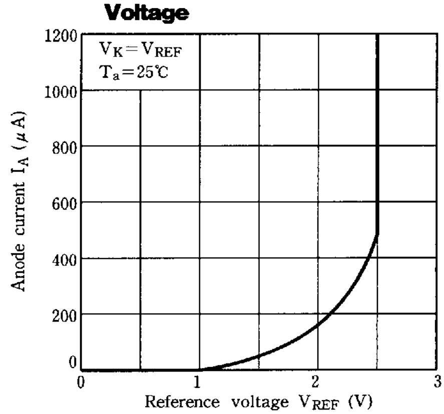


Fig.14 OFF-state Anode Current vs. Ambient Temperature

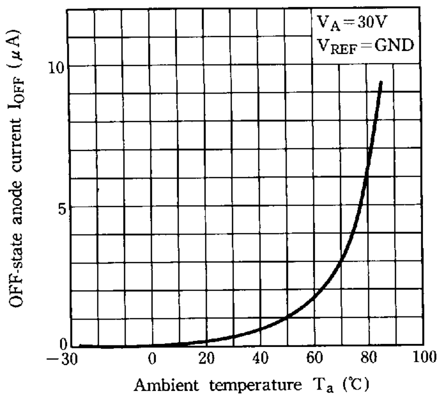


Fig.15 Reference Voltage Change vs. Ambient Temperature

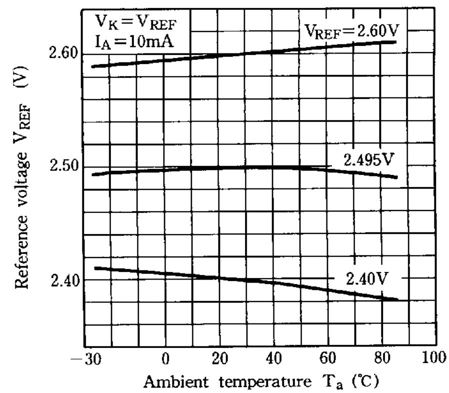


Fig.16 Reference Input Current vs. Ambient Temperature

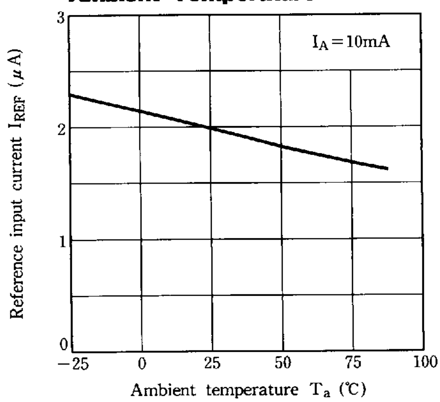


Fig.17 Reference Voltage Change vs. Anode Voltage

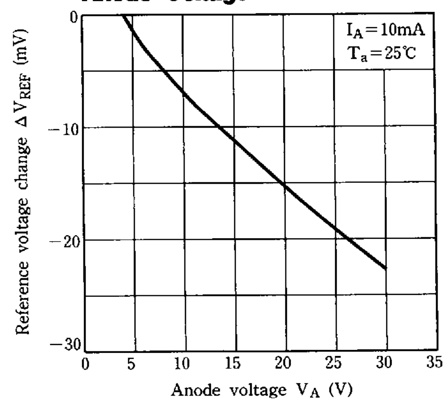
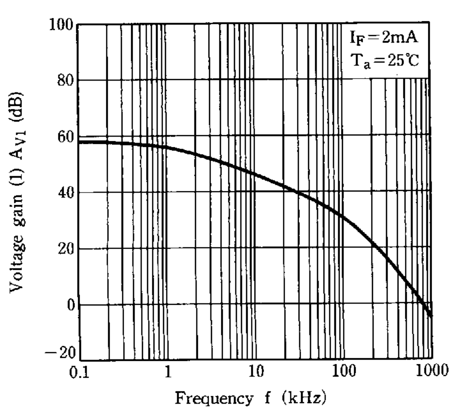
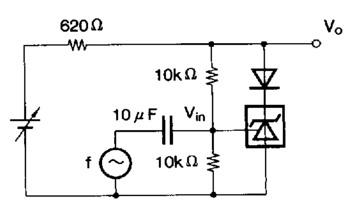


Fig.18-a Voltage Gain (1) vs. Frequency

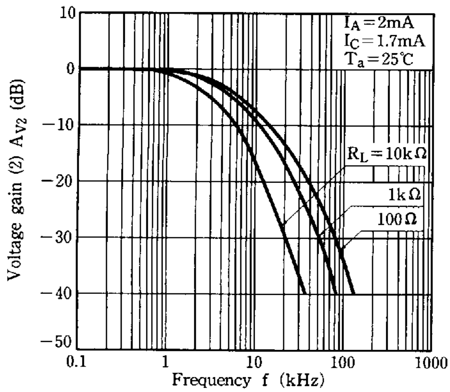


Test Circuit for Voltage Gain (1) vs. Frequency



$$A_{V1} = 20 \log \frac{V_o}{V_{in}}$$

Fig.18-b Voltage Gain (2) vs. Frequency



Test Circuit for Voltage Gain (2) vs. Frequency

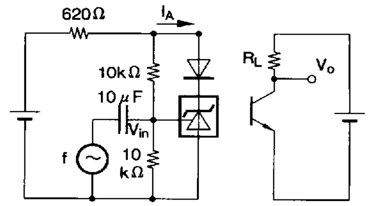
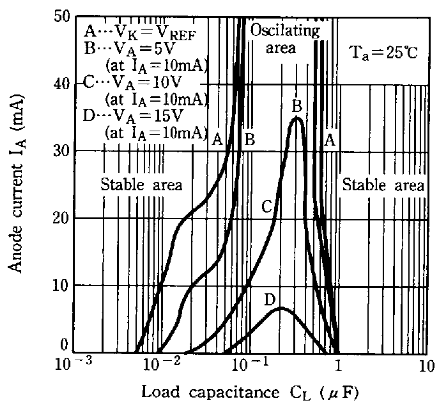


Fig.19 Anode Current vs. Load Capacitance



Test Circuit for Anode Current vs. Load Capacitance

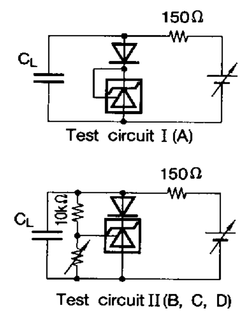


Fig.20 Collector-emitter Saturation Voltage vs. Ambient Temperature

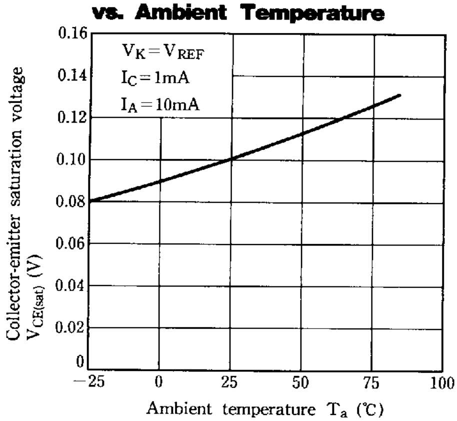
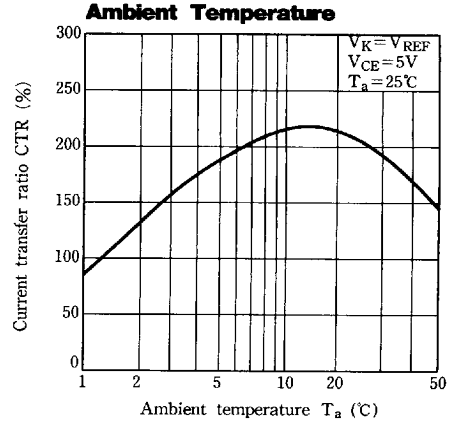


Fig.21 Current Transfer Ratio vs. Ambient Temperature



Precautions for Use

Handle this product the same as with other integrated circuits against static electricity.

- As for other general cautions, refer to the chapter "Precautions for Use" (Page 78 to 93).

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