PC814 Series

AC Input **Photocoupler**

※ Lead forming type (I type) and taping reel type (P type) are also available (PC8141/PC814P) (Page 656)

■ Features

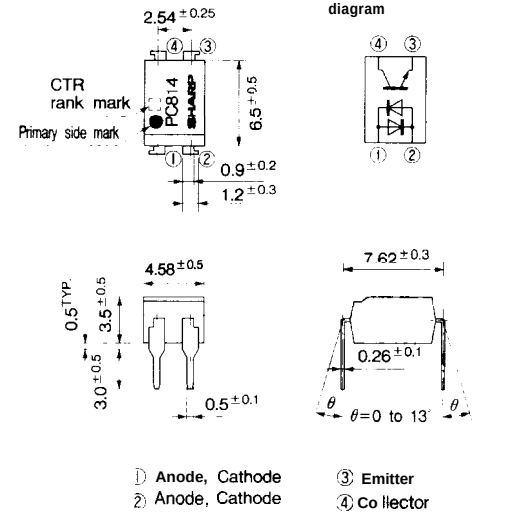
1. AC input
2. High isolation voltage between input and output (V :5 000V_{rms})
3. Compact dual-in-line package
   PC814 (1-channel type)
   PC824 (2-channel type)
   PC844 (4-channel type)
4. Current transfer ratio
   CTR : MIN. 20% at $I_F = \pm 1mA, V_{CE} = 5V$
5. Recognized by UL, file No. E64380

■ Applications

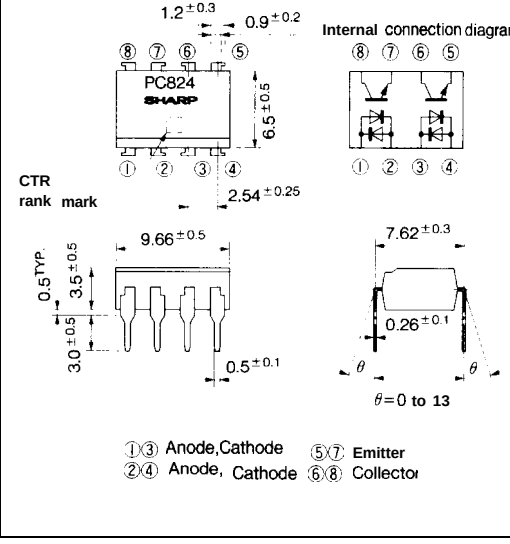
1. Programmable controllers
2. Telephone sets, telephone exchangers
3. System appliances
4. Signal transmission between circuits of different potentials and impedances

■ Outline Dimensions (Unit : mm)

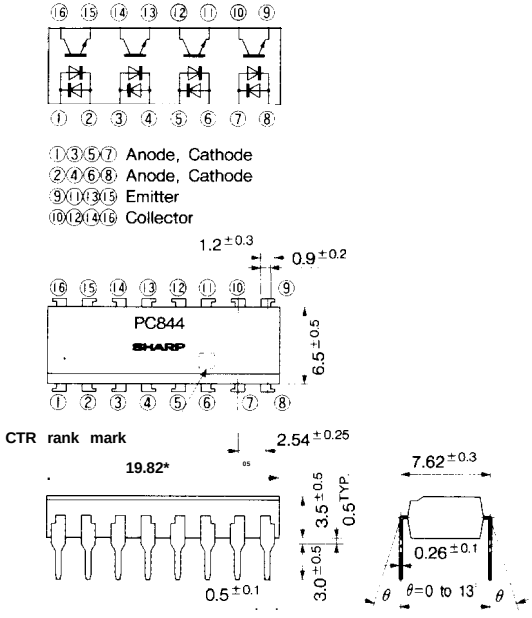
PC814



PC824



PC844 Internal connection diagram



■ Absolute Maximum Ratings (Ta= 25℃)

Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	±50	mA
	*1 Peak forward current	I_{FM}	±1	A
	Power dissipation	P	70	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}	200	mW
*2 Isolation voltage		V_{iso}	5000	V_{rms}
Operating temperature		T_{opr}	−30 to +100	℃
Storage temperature		T_{stg}	−55 to +125	℃
*3 Soldering temperature		T_{sol}	260	℃

*1 Pulse width ≦100 μs, Duty ratio = 0.001
*2 40 to 60% RH, AC for 1 minute
*3 For 10 seconds

■ Electro-optical Characteristics (Ta=25℃)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage	V_F	I_F = ±20mA		1,2	1.4	V
	Peak forward voltage	V_{FM}	I_{FM} = ±0.5V	−	−	3.0	V
	Terminal capacitance	C_t	V=0, f=1kHz	−	50	250	pF
Output	Collector dark current	I_{CEO}	V_{CE} = 20V, I_F = 0	−	−	10^{-7}	A
Transfer characteristics	*4 Current transfer ratio	CTR	I_F = ±1mA, V_{CE} = 5V	20	−	300	%
	Collector-emitter saturation voltage	$V_{CE(sat)}$	I_F = ±20mA, I_C = 1mA	−	0.1	0.2	V
	Isolation resistance	R_{ISO}	DC500V, 40 to 60%RH	5×10^{10}	10^{11}	−	Ω
	Floating capacitance	C_f	V = 0, f = 1MHz	−	0.6	1.0	pF
	Cut-off frequency	f_c	V_{CE} = 5V, I_C = 2mA, R_L = 100Ω, −3dB	15	80		kHz
	Response time	Rise time t_r / Fall time t_f	V_{CE} = 2V, I_C = 2mA, R_L = 100Ω	−	4 / 3	18 / 18	μs

*4 Classification table of current transfer ratio

Model No.	Rank mark	CTR (%)
PC814A	A	**50** to **150**
PC824A		
PC844A		
PC814	A or no mark	**20** to **300**
PC824		
PC844		

Fig. 1 Forward **Current vs.** Ambient Temperature

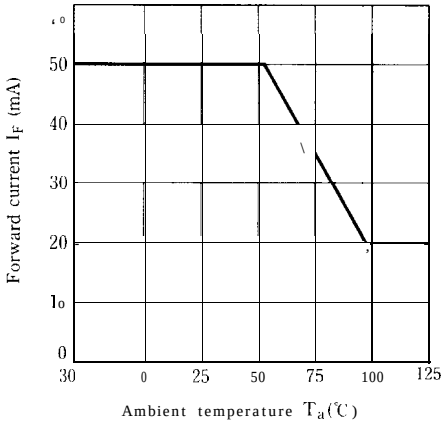


Fig. 2 Collector Power Dissipation VS. Ambient Temperature

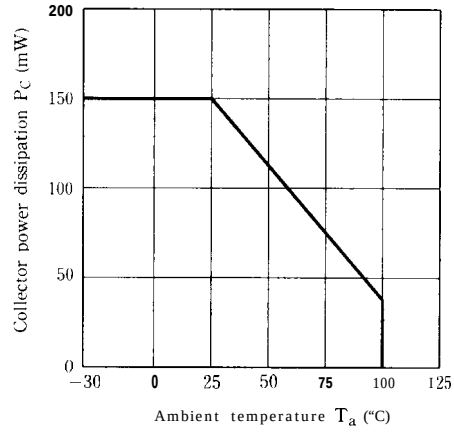


Fig. 3 Peak **Forward Current vs.** Duty Ratio

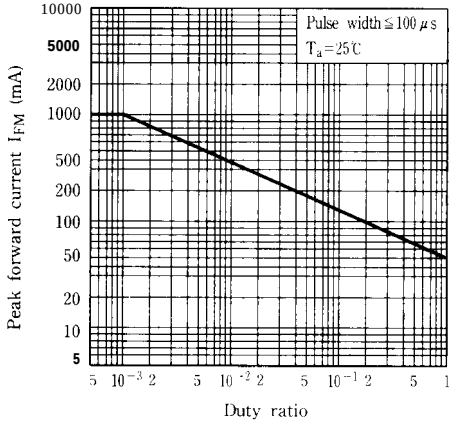


Fig. 4 Forward Current **vs. Forward Voltage**

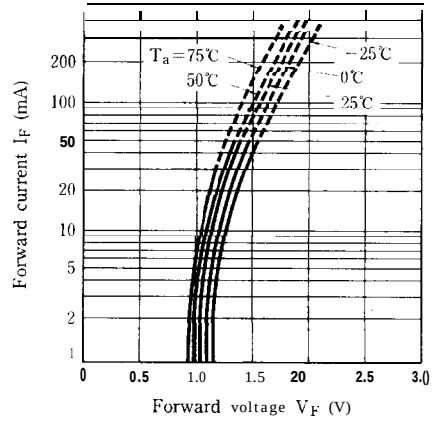


Fig. 5 Current Transfer Ratio vs. Forward Current

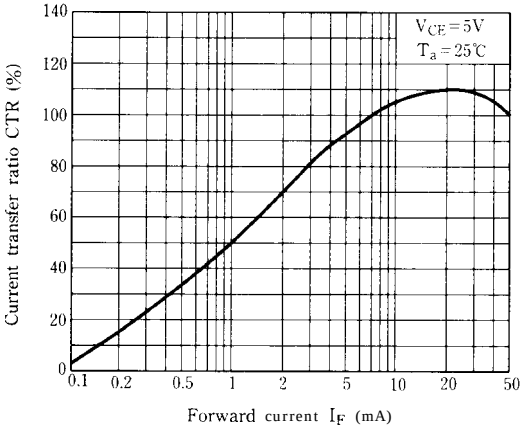


Fig. 6 Collector Current vs. Collector-emitter Voltage

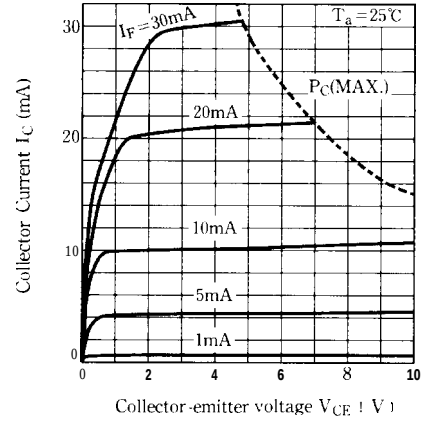


Fig. 7 Relative Current Transfer Ratio vs. Ambient Temperature

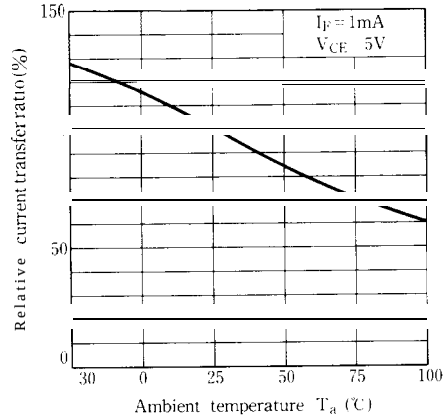


Fig. 8 Collector-emitter Saturation Voltage vs. Ambient Temperature

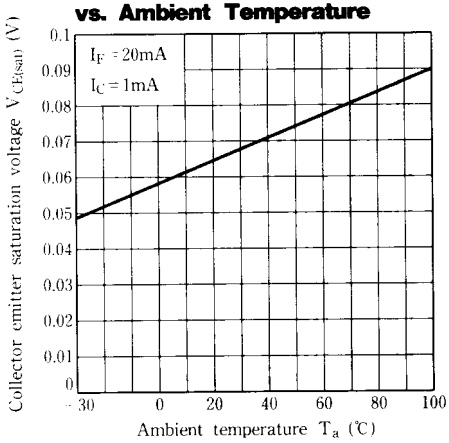


Fig. 9 Collector Dark Current vs. Ambient Temperature

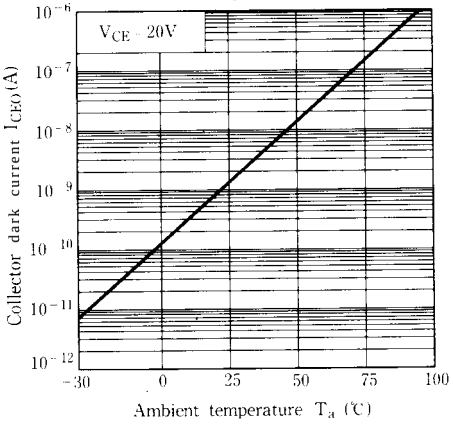


Fig.10 Response Time vs. Load Resistance

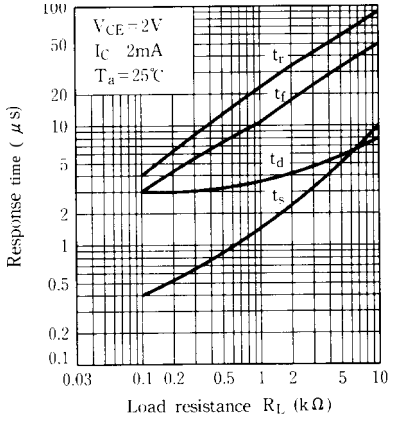
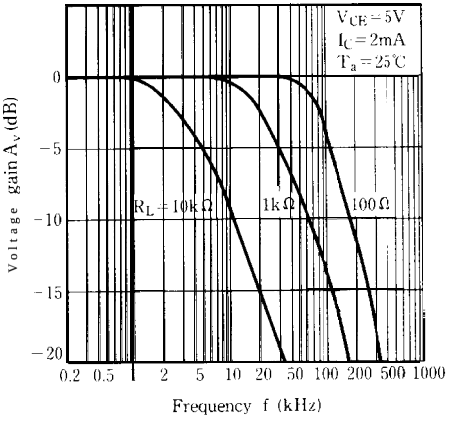
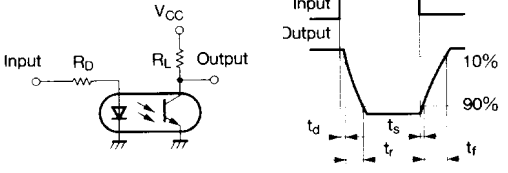


Fig.11 Frequency Response

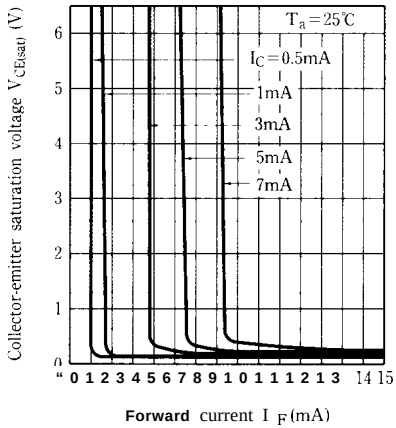


Test Circuit for Response Time

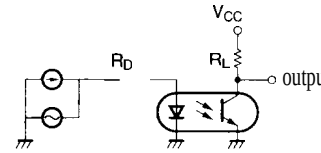


6 Photocouplers

Fig.12 Collector-emitter Saturation Voltage vs. Forward Current



Test Circuit for Frepuency Response



● Please refer to the chapter “Precautions for Use” (Page 78 to 93)