PC81 O

High Speed Under High Load Resistance Photocoupler

※ Lead forming type (I type) and taping reel type (P type) are also available. (PC810I/PC810P) (page 656)

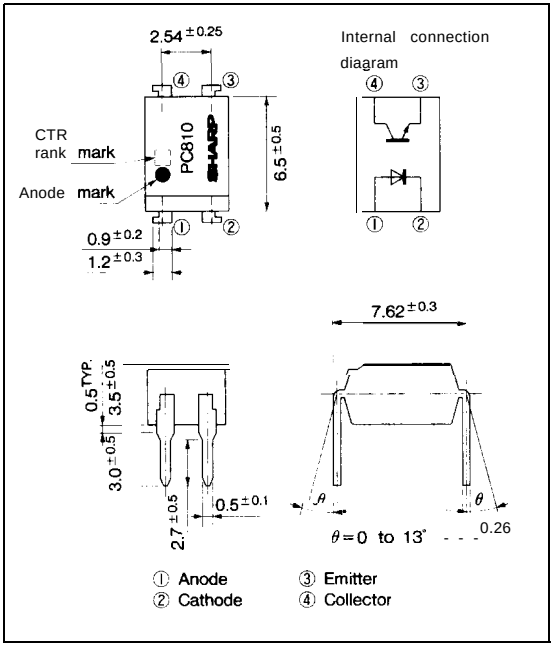
■ Features

1. High speed response under high resistance load
   (t_{off} : MAX. 1ms at I_F = 1mA, V_{CC} = 5V, R_L = 110kΩ)
2. High current transfer ratio under low input current
   (CTR : MIN. 60% at I_F = 1mA, V_{CE} = 0.4V)
3. High isolation voltage between input and output
   (V,.(, :5 000V_{rms})
4. Compact dual-in-line package
5. Recognized by UL, file No. E64380

■ Applications

1. Solid state relays
2. Motor-control equipment
3. Signal transmission between circuits of different potentials and impedances

■ Outline Dimensions (Unit : mm)



■ Absolute Maximum Ratings (T_a = 25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	50	mA
	*1Peak forward current	I_{FM}	1	A
	Reverse voltage	V_R	6	v
	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
*2Isolation voltage		V_{iso}	5 000	V_{rms}
Operating temperature		T_{opr}	–30 to +100	℃
Storage temperature		T_{stg}	–55 to +125	℃
‘Soldering temperature		T_{sol}	260	‘c

*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}=0.5A	−	−	3.0	v
	Reverse current		I_R	V_R=4V			10	μA
	Terminal capacitance		C_t	V=0, f=1kHz	−	30	250	pF
output	Collector dark current		I_{CEO}	V_{CE}=20V, I_F=0	−	−	10^{-7}	A
Transfer characteristics	*5 Current transfer ratio		CTR	I_F=1mA, V_{CE}=0.4V	60		200	%
	Collector -emitter saturation voltage		$V_{CE(sat)}$	I_F=20mA, Ic= 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 frequent}		f_c	V_{CE}=5V, I_C=2mA, R_L=1kΩ, −3dB	6	60	−	kHz
	*5 Response time	Rise time	t_r	V_{CE}=2V, I_C=2mA, R_L=1kΩ	-	10	50	μs
		Fall time	tf			10	50	μs
	*5 Turn-off time		toff	V_{CC}=5V, I_F=1mA, R_L=110kΩ	−	0.5	1.0	ms

*5 Classification table of current transfer ratio and response time is shown below

Model No.	Rank mark	CTR (%)	t_r (μs)		t_f (μs)		t_{off} (μs)	
			TYP.	MAX.	TYP.	MAX.	TYP.	MAX.
PC810A	A	60 to 120	4	15	3	15	350	500
PC810B	B	100 to 200	10	50	10	50	500	1000
PC810	A or B, or no marking	60 to 200	-	50	-	50	-	1000
Measurement conditions		I_F=1mA, V_{CE}=0.4V, T_a=25℃	V_{CE}=2V, I_C=2mA, R_L=1kΩ, T_a=25℃				I_F=1mA, V_{CC}=5V, R_L=110kΩ, T_a=25℃	

Fig. 1 Forward Current vs. Ambient Temperature

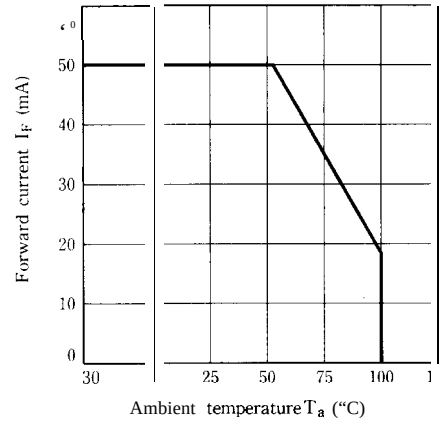


Fig. 2 Collector Power Dissipation vs. Ambient Temperature

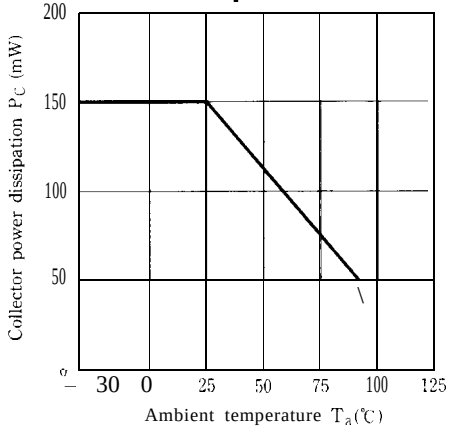


Fig. 3 Paek Foward Current vs. Duty Ratio

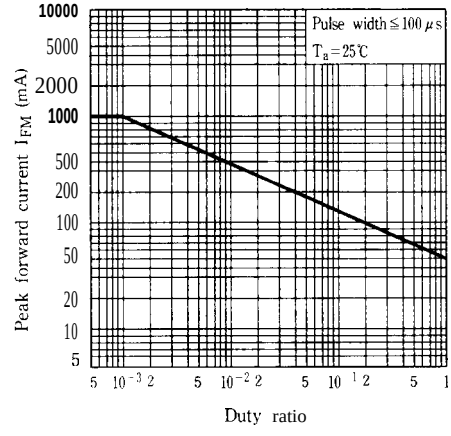


Fig. 4 Forward Current vs. Forward Voltage

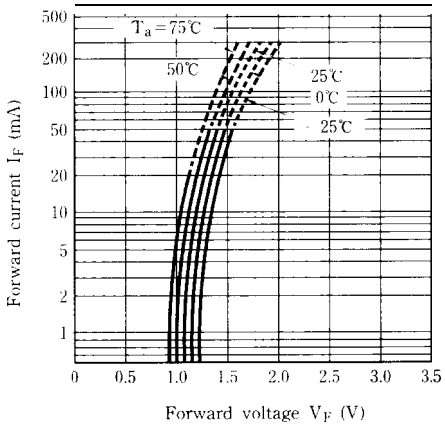


Fig. 5 Current Transfer Ratio vs. Forward Current

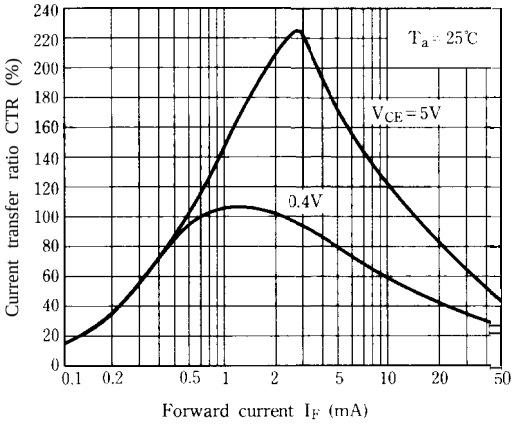


Fig. 6 Collector Current vs. Collector-emitter Voltage

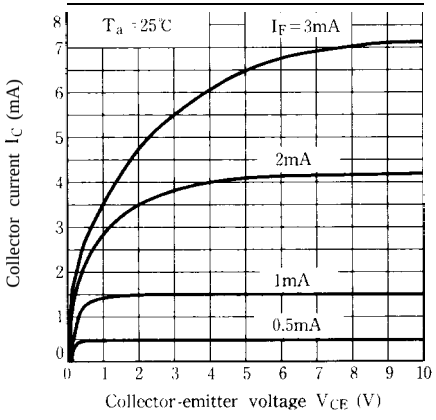


Fig. 7 Relative Current Transfer Ratio vs. Ambient Temperature

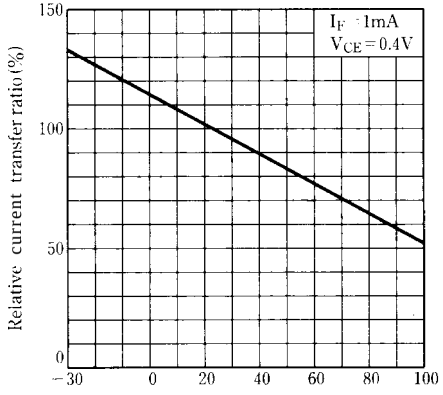


Fig. 8 Collector-emitter Saturation Voltage vs. Ambient Temperature

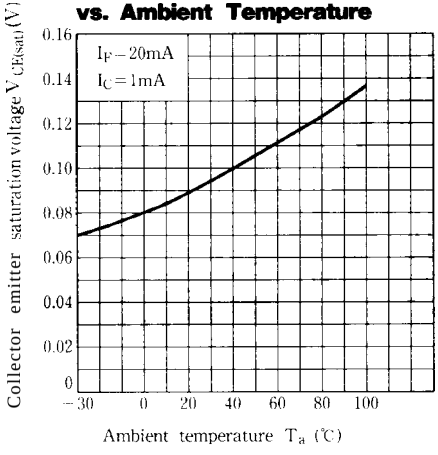


Fig. 9 Collector Dark Current vs. Ambient Temperature

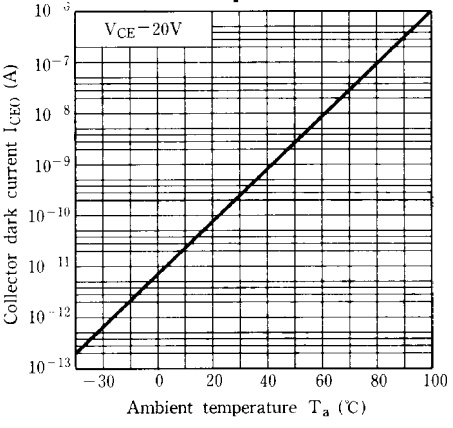


Fig.10 Response Time vs. Load Resistance

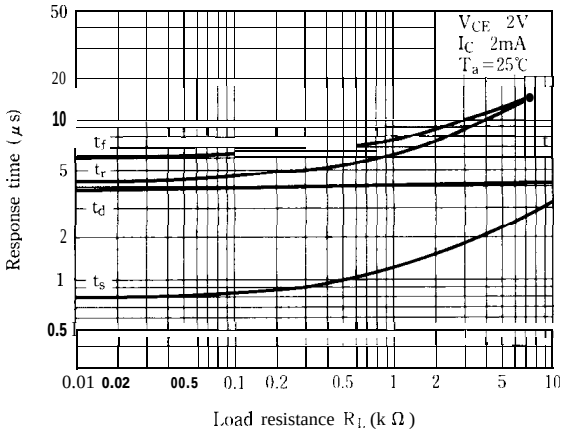


Fig. 11 Turn-off Time vs. Load Resistance

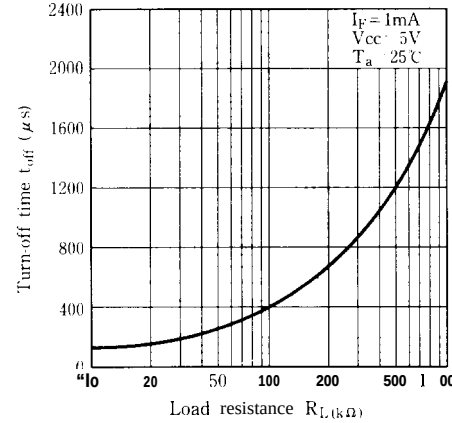


Fig.12 Turn-off Time vs. Ambient Temperature

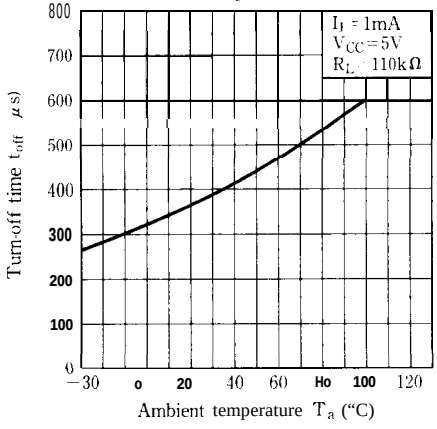
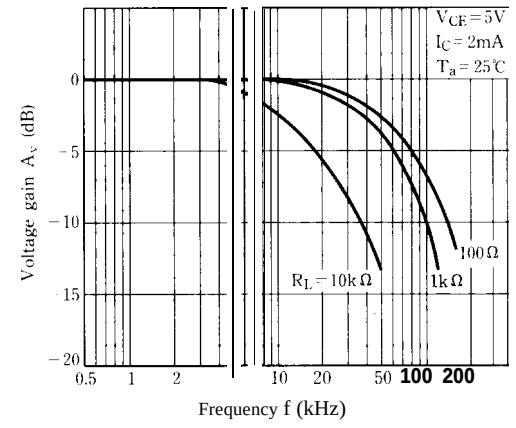
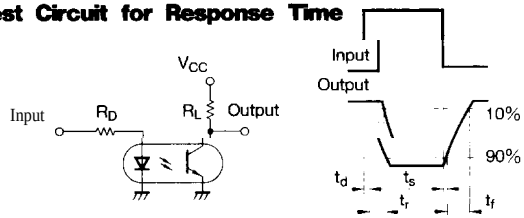


Fig.13 Frequency Response



Test Circuit for Response Time



Test Circuit for Frepuency Response

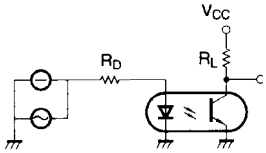
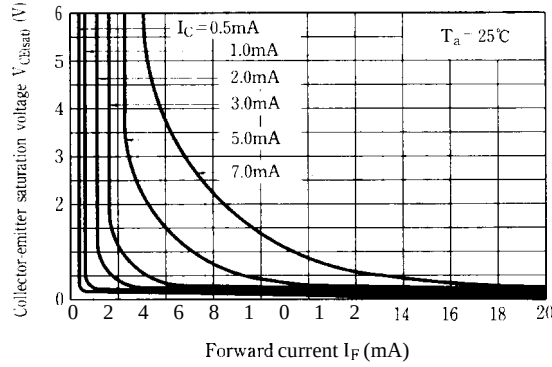


Fig.14 Collector-emitter Saturation Voltage vs. Forward Current



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