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PC810

High Speed Under High Load Resistance Photocoupler

❋ Lead forming type (I type) and taping reel type (P type) are also available. (**PC810I/PC810P**)

■ Features

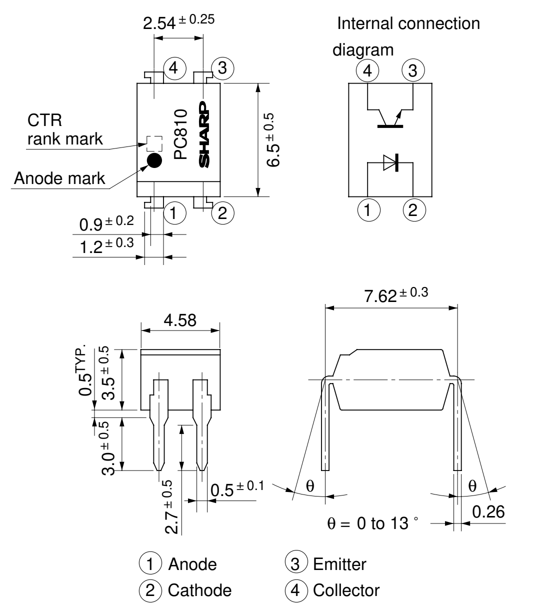
1. High speed response under high resistance load
   (t_{off} : MAX. 1ms at I_F = 1mA, V_{CC} = 5V, R_L = 110kΩ)
2. High current transfer ratio under low input current
   (CTR : MIN. 60% at I_F = 1mA, V_{CE} = 0.4V)
3. High isolation voltage between input and output
   (V_{iso} : 5 000V $_{rms}$)
4. 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
	*1 Peak 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
*2 Isolation voltage		V_{iso}	5 000	V_{rms}
Operating temperature		T_{opr}	- 30 to + 100	˚C
Storage temperature		T_{stg}	- 55 to + 125	˚C
*3 Soldering temperature		T_{sol}	260	˚C

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

■ Electro-optical Characteristics

(Ta= 25˚C)

	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, 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 = 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	t_f		-	10	50	μs
	*5 Turn-off time		t_{off}	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	1 000
PC810	A or B, or no marking	60 to 200	-	50	-	50	-	1 000
Measurement conditions		I_F = 1mA V_{CE} = 0.4V T_a = 25˚C	V_{CE} = 2V I_C = 2mA R_L = 1kΩ T_a = 25˚C				I_F = 1mA V_{CC} = 5V R_L = 110kΩ T_a = 25˚C	

Fig. 1 Forward Current vs. Ambient Temperature

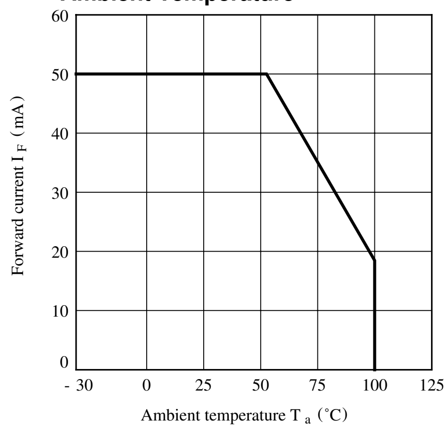


Fig. 2 Collector Power Dissipation vs. Ambient Temperature

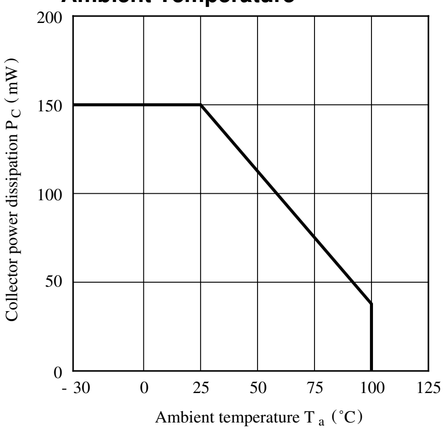


Fig. 3 Paek Foward Current vs. Duty Ratio

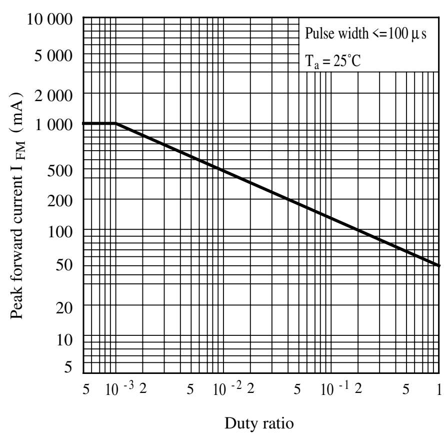


Fig. 4 Forward Current vs. Forward Voltage

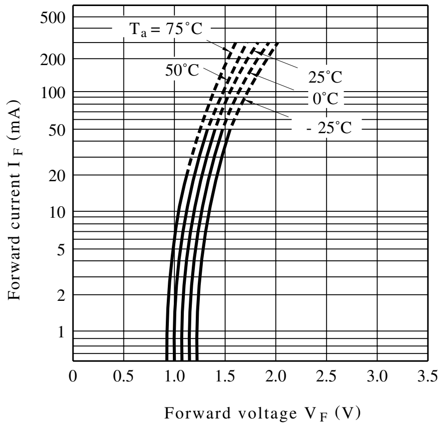


Fig. 5 Current Transfer Ratio vs. Forward Current

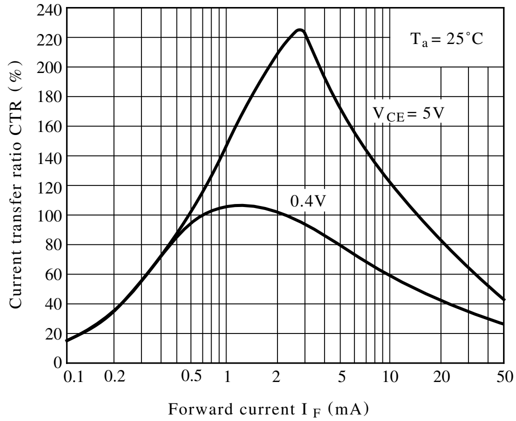


Fig. 6 Collector Current vs. Collector-emitter Voltage

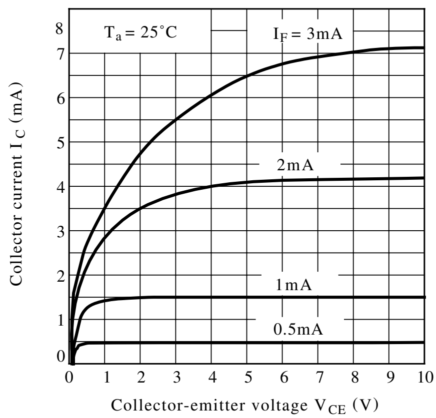


Fig. 7 Relative Current Transfer Ratio vs. Ambient Temperature

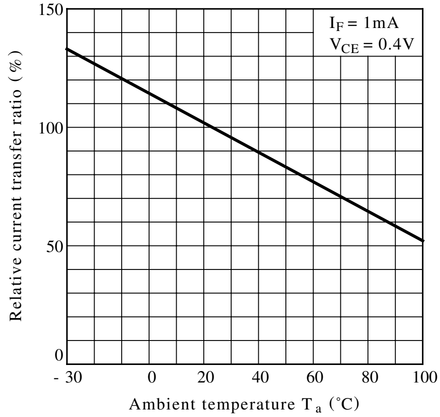


Fig. 8 Collector-emitter Saturation Voltage vs. Ambient Temperature

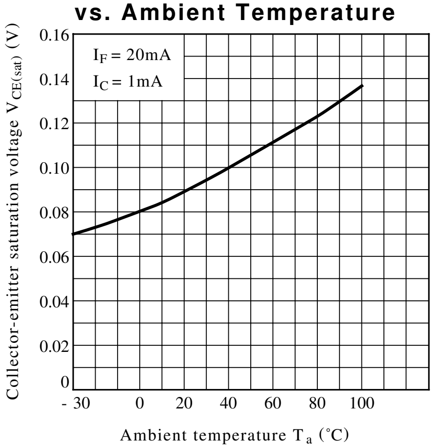


Fig. 9 Collector Dark Current vs. Ambient Temperature

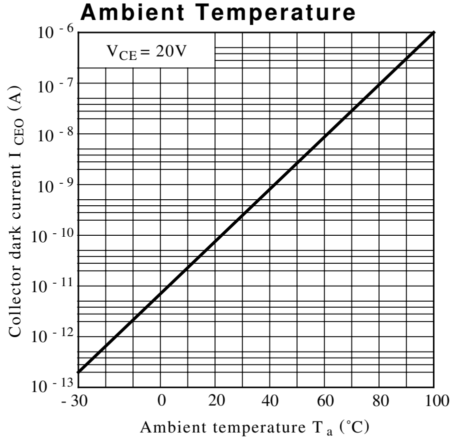


Fig.10 Response Time vs. Load Resistance

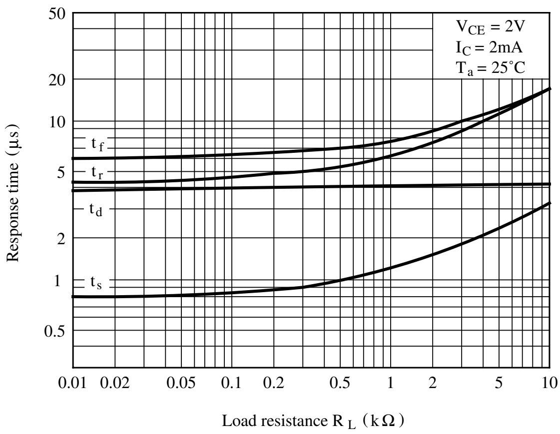


Fig.11 Turn-off Time vs. Load Resistance

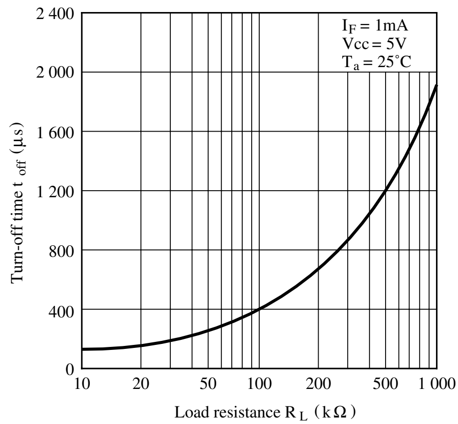


Fig.12 Turn-off Time vs. Ambient Temperature

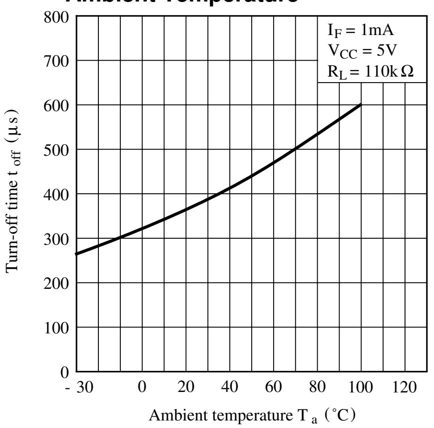
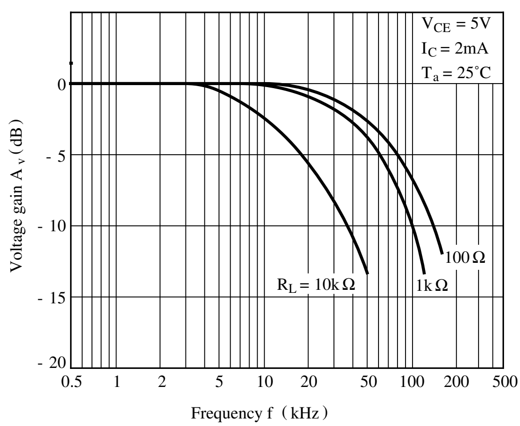
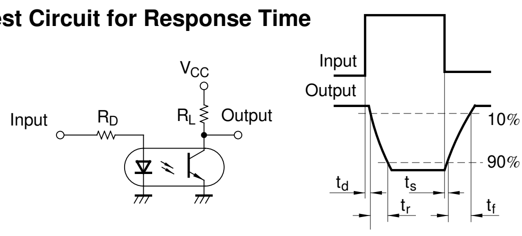


Fig.13 Frequency Response



Test Circuit for Response Time



Test Circuit for Frepuency Response

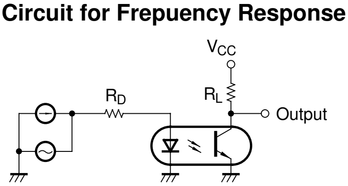
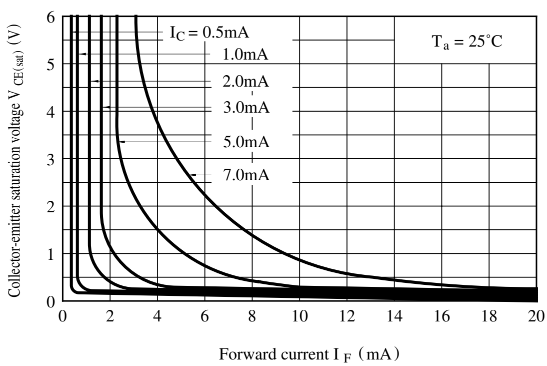


Fig.14 Collector-emitter Saturation Voltage vs. Forward Current



● Please refer to the chapter "Precautions for Use"

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— Consumer electronics

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