PC812

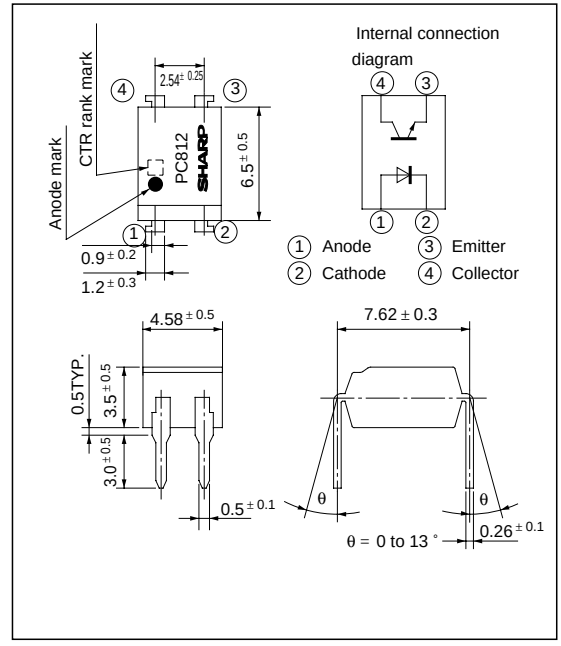
High Noise Resistance Type Photocoupler

■ Features

1. High noise reduction
   (Common mode rejection voltage
   V_{CM} : TYP. 1.5kV at dv/dt = 2kV/μs,
   R_L = 470Ω, V_{np} = 100mV)
2. High current transfer ratio
   (CTR : MIN. 90% at I_F = 5mA, V_{CE} = 5V)
3. High isolation voltage between input and output (V_{iso} : 5 000V $_{rms}$)
4. Compact dual-in-line package

■ Outline Dimensions

(Unit : mm)



■ Applications

1. Motor-control circuits
2. Computer terminals
3. System appliances, measuring instruments
4. Signal transmission between circuits of different potentials and impedances

■ 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	°C
Storage temperature		T_{stg}	- 55 to + 125	°C
*3Soldering 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

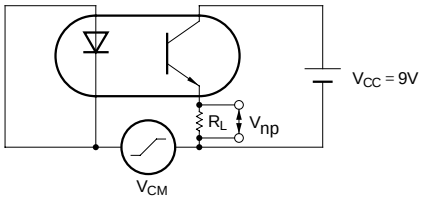
(Ta= 25˚C)

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	200	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 = 5mA, V_{CE} = 5V	90	-	480	%
	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
	*4 Response time	Rise time	t_r	V_{CE} = 2V, I_C = 2mA, R_L = 100Ω	-	4	18	μs
		Fall time	t_f		-	5	20	μs
	*5 Common mode rejection voltage		V_{CM}	dV/dt = 2kV/μs, R_L = 470Ω, V_{np} = 100mV, I_F = 0	-	1.5	-	kV

*4 Classification table of current transfer ratio is shown below.

Model No.	Rank mark	CTR (%)	t_r(μs)		t_f(μs)	
			TYP.	MAX.	TYP.	MAX.
PC812A	A	90 to 180	3	14	4	16
PC812B	B	150 to 180	4	16	5	18
PC812C	C	240 to 480	5	18	7	20
PC812	A, B or C	90 to 480	4	18	5	20
Measurement conditions		I = 5mA V_{CE} = 5V T_a = 25˚C	V_{CE} = 2V I_C = 2mA R_L = 100Ω T_a = 25˚C			

*5 Test Circuit for V_{CM}



V_{CM} : Common mode rejection voltage (higher value of pulse wave)

dv/dt : Rising factor of voltage

Test condition
V_{np} = 100mV, R_L = 470Ω
dv/dt = 2kV/μs, I_F = 0

Fig. 1 Forward Current vs. Ambient Temperature

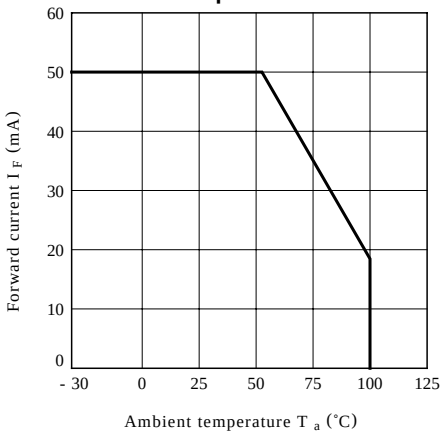


Fig. 2 Collector Power Dissipation vs. Ambient Temperature

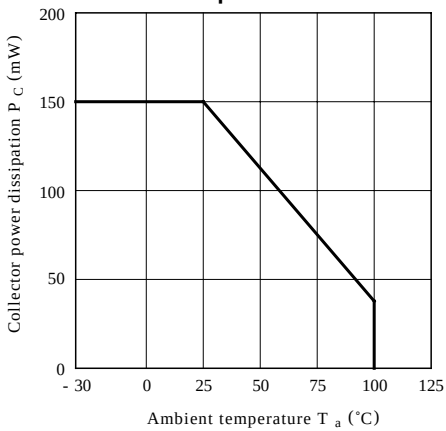


Fig. 3 Peak Forward Current vs. Duty Ratio

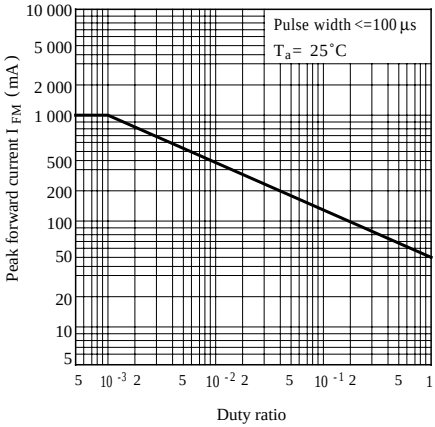


Fig. 4 Forward Current vs. Forward Voltage

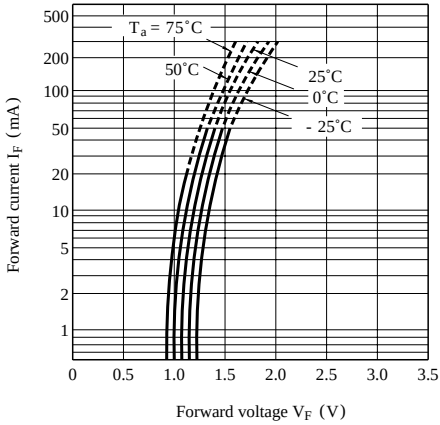


Fig. 5 Current Transfer Ratio vs. Forward Current

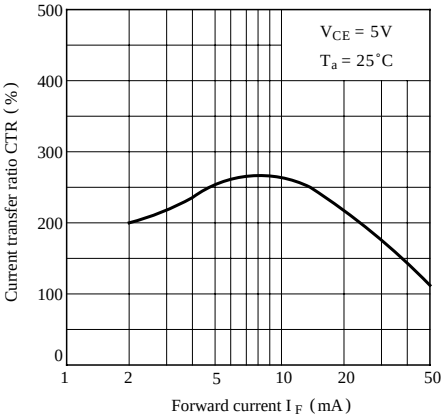


Fig. 6 Collector Current vs. Collector-emitter Voltage

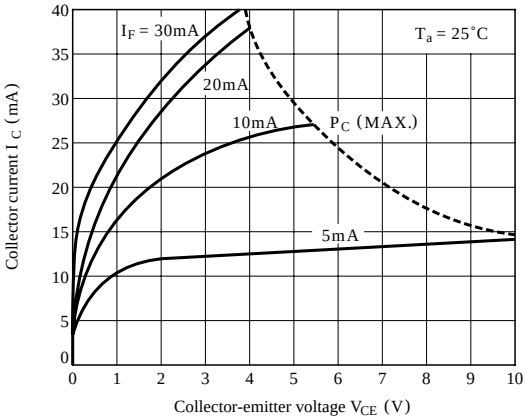


Fig. 7 Relative Current Transfer Ratio vs. Ambient Temperature

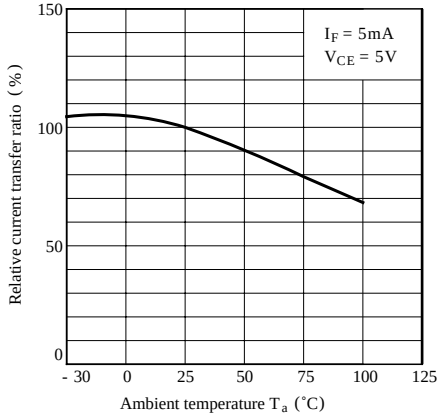


Fig. 8 Collector-emitter Saturation Voltage vs. Ambient Temperature

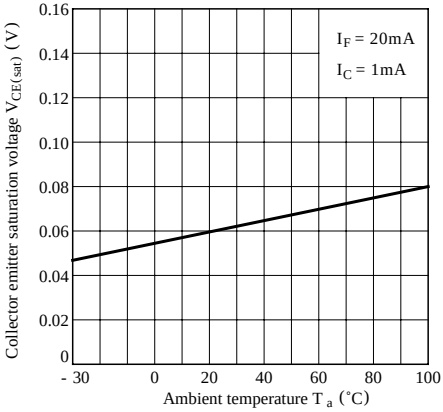


Fig. 9 Collector Dark Current vs. Ambient Temperature

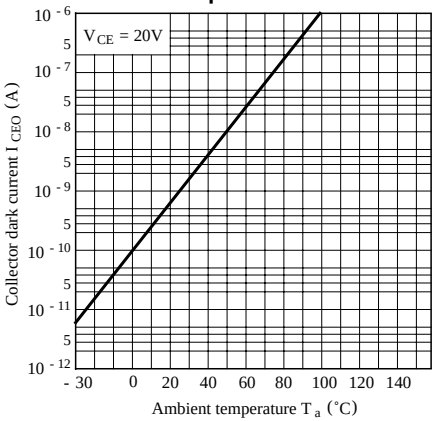


Fig.10 Response Time vs. Load Resistance

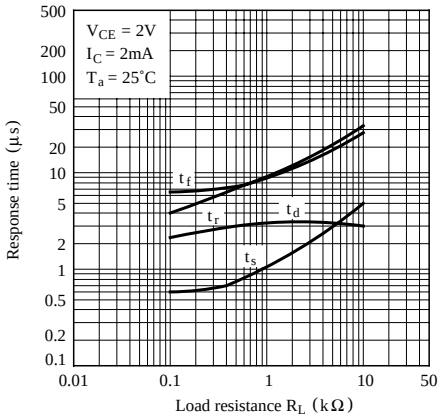
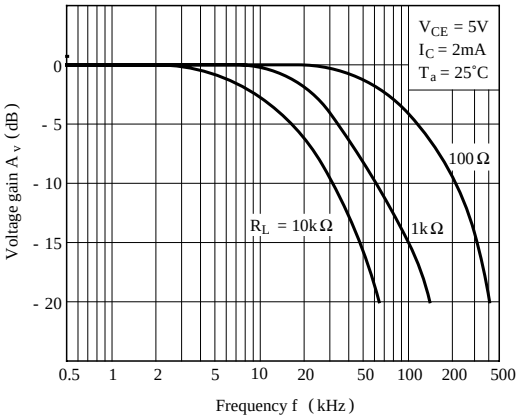


Fig.11 Frequency Response



Test Circuit for Response Time

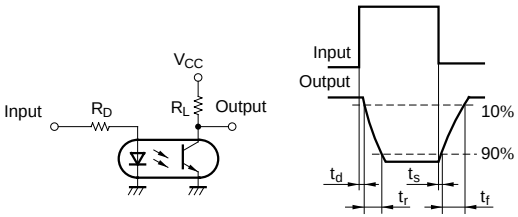
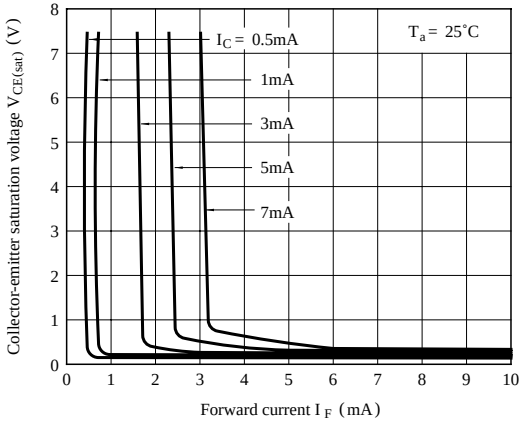
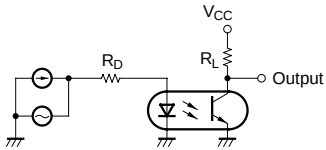


Fig.12 Collector-emitter Saturation Voltage vs. Forward Current



Test Circuit for Frepuency Response



● Please refer to the chapter "Precautions for Use"

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