

# PC814X

## AC Input Photocoupler

\* Lead forming type (I type) and taping reel type (P type) are also available. (PC814XI/PC814XP)

### ■ Features

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

### ■ Applications

1. Programmable controllers
2. Telephones
3. Facsimiles

### ■ Absolute Maximum Ratings ( $T_a=25^\circ\text{C}$ )

	Parameter	Symbol	Rating	Unit
Input	Forward current	$I_F$	$\pm 50$	mA
	*1 Peak forward current	$I_{FM}$	$\pm 1$	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	$V_{iso(rms)}$	5	kV
	Operating temperature	$T_{opr}$	-30 to +100	$^\circ\text{C}$
	Storage temperature	$T_{stg}$	-55 to +125	$^\circ\text{C}$
	*3 Soldering temperature	$T_{sol}$	260	$^\circ\text{C}$

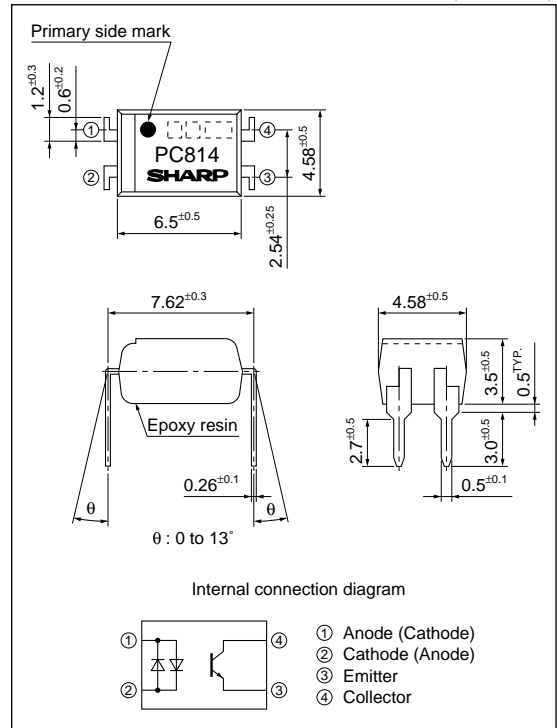
\*1 Pulse widths $\leq 100\mu\text{s}$ , Duty ratio:0.001

\*2 40 to 60%RH, AC for 1 minute

\*3 For 10s

### ■ Outline Dimensions

(Unit : mm)



## ■ Electro-optical Characteristics

(T<sub>a</sub>=25°C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit	
Input	Forward voltage	V <sub>F</sub>	I <sub>F</sub> =±20mA	–	1.2	1.4	V	
	Peak forward voltage	V <sub>FM</sub>	I <sub>FM</sub> =±0.5V	–	–	3.0	V	
	Terminal capacitance	C <sub>t</sub>	V=0, f=1kHz	–	50	250	pF	
Output	Collector dark current	I <sub>CEO</sub>	V <sub>CE</sub> =20V, I <sub>F</sub> =0	–	–	100	nA	
Transfer characteristics	Collector current	I <sub>C</sub>	I <sub>F</sub> =±1mA, V <sub>CE</sub> =5V	0.2	–	3.0	mA	
	Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	I <sub>F</sub> =±20mA, I <sub>C</sub> =1mA	–	0.1	0.2	V	
	Isolation resistance	R <sub>ISO</sub>	DC500V, 40 to 60% RH	5×10 <sup>10</sup>	10 <sup>11</sup>	–	Ω	
	Floating capacitance	C <sub>f</sub>	V=0, f=1MHz	–	0.6	1.0	pF	
	Cut-off frequency	f <sub>c</sub>	V <sub>CE</sub> =5V, I <sub>C</sub> =2mA, R <sub>L</sub> =100Ω, -3dB	15	80	–	kHz	
	Response time	Rise time Fall time	t <sub>r</sub> t <sub>f</sub>	V <sub>CE</sub> =2V, I <sub>C</sub> =2mA, R <sub>L</sub> =100Ω		– –	4 3	18 18

## ■ Rank Table

(I<sub>F</sub>=±1mA, V<sub>CE</sub>=5V, T<sub>a</sub>=25°C)

Model No.	Rank mark	I <sub>C</sub> (mA)
<b>PC814X</b>	A or no mark	0.2 to 3.0
<b>PC814X1</b>	A	0.5 to 1.5

Fig.1 Forward Current vs. Ambient Temperature

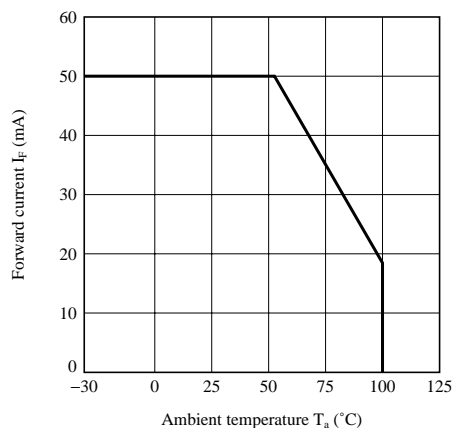
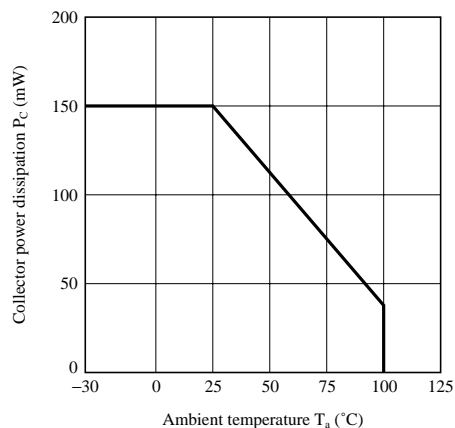
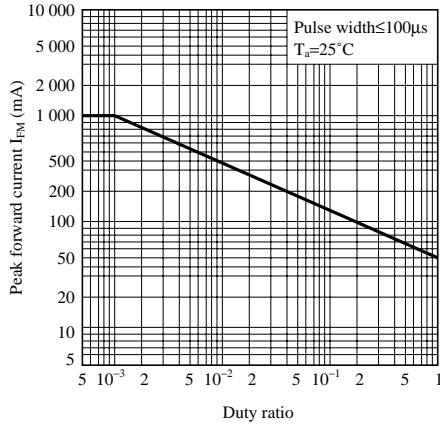


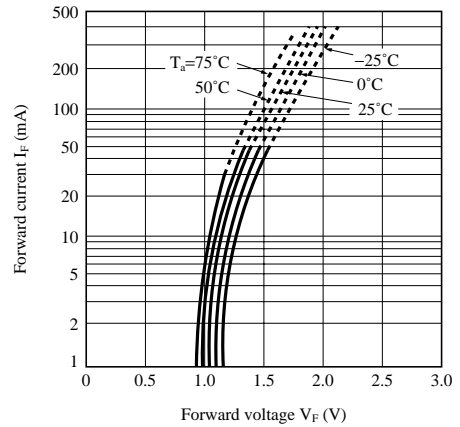
Fig.2 Collector Power Dissipation vs. Ambient Temperature



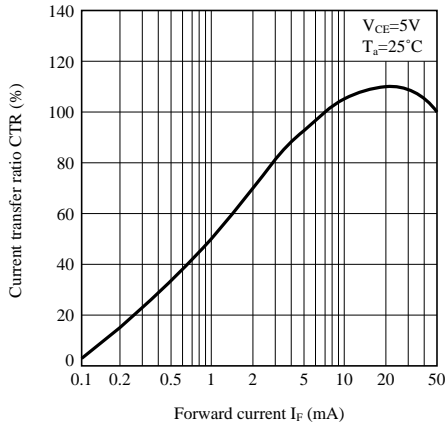
**Fig.3 Peak Forward Current vs. Duty Ratio**



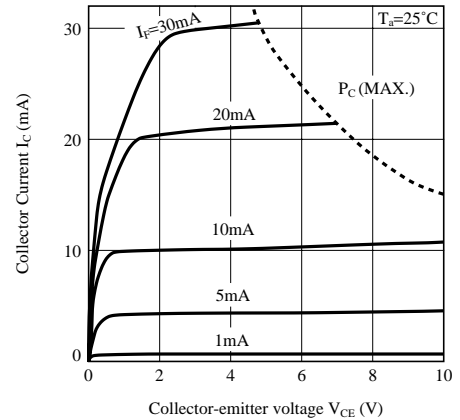
**Fig.4 Forward Current vs. Forward Voltage**



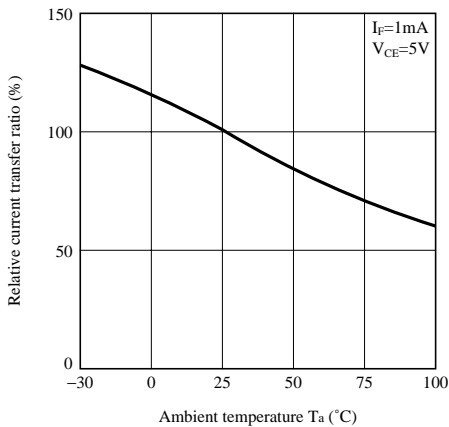
**Fig.5 Current Transfer Ratio vs. Forward Current**



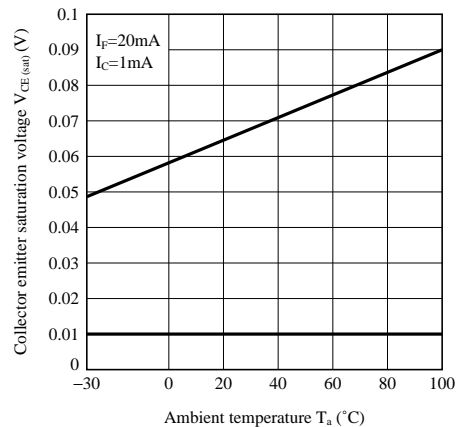
**Fig.6 Collector Current vs. Collector-emitter Voltage**



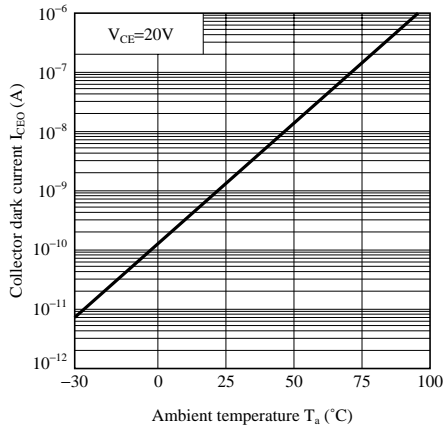
**Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature**



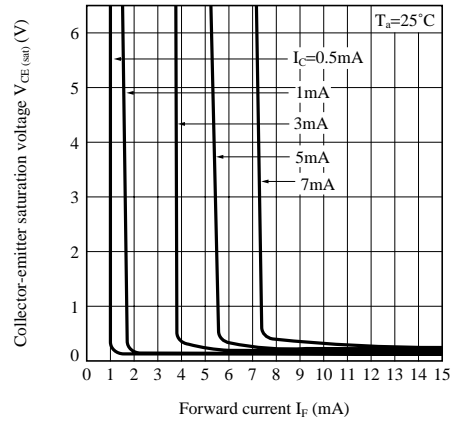
**Fig.8 Collector - emitter Saturation Voltage vs. Ambient Temperature**



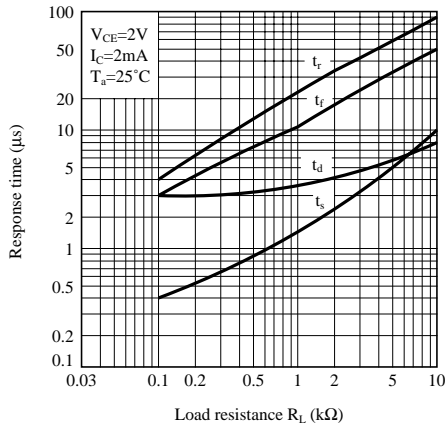
**Fig.9 Collector Dark Current vs. Ambient Temperature**



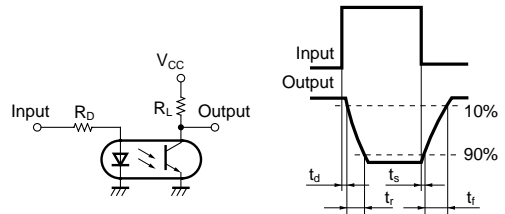
**Fig.10 Collector-emitter Saturation Voltage vs. Forward Current**



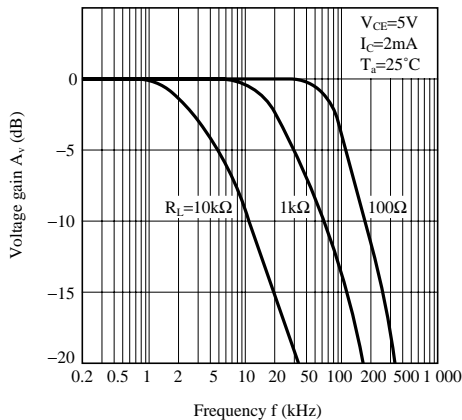
**Fig.11 Response Time vs. Load Resistance**



**Test Circuit for Response Time**



**Fig.12 Frequency Response**



**Test Circuit for Frequency Response**

