

### GENERAL DESCRIPTION

The PC817 contains a light emitting diode optically coupled to a phototransistor. It is packaged in a 4-pin DIP package. Input-output isolation voltage is 5000Vrms. Response time,  $t_r$ , is typically 4 $\mu$ s and minimum CTR is 50% at input current of 5mA.

### FEATURES

- Current transfer ratio (CTR:MIN.50% at IF =5mA ,VCE =5V)

- High isolation voltage between input and output (Viso=5000 V rms )
- Minimum BVCEO of 70V guaranteed
- Compact dual-in-line package

### APPLICATIONS

- Feedback circuit in power supply
- System appliances, measuring instruments
- Registers, copiers, automatic vending machines
- Electric home appliances, such as fan heaters, etc.

### ORDERING INFORMATION

PACKAGE	TEMPERATURE RANGE	ORDERING PART NUMBER	TRANSPORT MEDIA	MARKING
PDIP-4	-30°C to +100°C	PC817x	Tube 50 units	PC817x YYWW

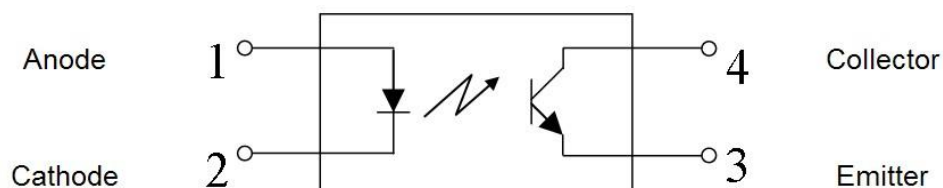
**Note:** "YY" represents the year; "WW" on behalf of the week; "X" represents the product of file: A or B or C or D or L or -.

### Rank Table of CTR

Classification	PC817A	PC817B	PC817C	PC817D	PC817L	-
CTR	80~160	130~260	200~400	300~600	50~100	50~600

### TYPICAL APPLICATION CIRCUIT

### PIN ASSIGNMENT



PC817x (DIP-4)

### PIN DESCRIPTIONS

Names	Pin No.	Description
Anode	1	Input Anode
Cathode	2	Input Cathode
Emitter	3	Output Emitter
Collector	4	Output Collector

### ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

Symbol	Parameters		Value
I <sub>F</sub>	Input	Forward Current	50mA
V <sub>R</sub>		Reverse Voltage	6V
P		Power Dissipation	70mW
P <sub>C</sub>	Output	Collector Power Dissipation	150mW
I <sub>C</sub>		Collector Current	50mA
V <sub>CEO</sub>		Collector-Emitter Voltage	35V
V <sub>ECO</sub>		Emitter-Collector Voltage	6V
P <sub>tot</sub>	Total Power Dissipation		200mW
V <sub>iso</sub>	Isolation Voltage (Note 1)		5000V <sub>rms</sub>
T <sub>stg</sub>	Storage Temperature		-55~+125°C
T <sub>sol</sub>	Soldering Temperature (Note 2)		260°C

**Note 1:** AC for 1 minute, R.H. = 40 ~ 60%

Isolation voltage shall be measured using the following method.

(1) Short between anode and cathode on the primary side and between collector, emitter and base on the secondary side.

(2) The isolation voltage tester with zero-cross circuit shall be used.

(3) The waveform of applied voltage shall be a sine wave.

**Note 2:** For 10 seconds.

### OPERATING RANGE

Symbol	Parameters	Value
T <sub>opr</sub>	Operating Temperature	-30~+100°C

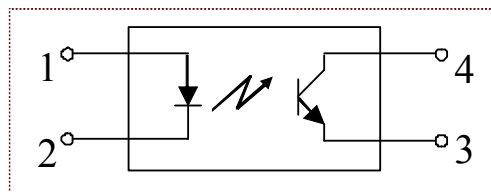
### ELECTRICAL CHARACTERISTICS

(T<sub>A</sub>=25°C, Unless Otherwise Noted.)

Symbol	Parameters		Conditions	Min.	Typ.	Max.	Units
V <sub>F</sub>	Input	Forward	I <sub>F</sub> =20mA	-	1.2	1.4	V
I <sub>R</sub>		Reverse Current	V <sub>R</sub> =4V	-	-	10	μA
C <sub>t</sub>		Terminal Capacitance	V=0, f=1kHz	-	30	250	pF
I <sub>CEO</sub>	Output	Collector Dark Current	V <sub>CE</sub> =20V	-	-	100	nA
BV <sub>CEO</sub>		Collector-Emitter Breakdown Voltage	I <sub>C</sub> =0.1mA, I <sub>F</sub> =0	70	-	-	V
BV <sub>ECO</sub>		Emitter-Collector Breakdown Voltage	I <sub>E</sub> =10μA, I <sub>F</sub> =0	6	-	-	V
CTR (Note 3)	Transfer Characteristics	Current Transfer Ratio	I <sub>F</sub> =5mA, V <sub>CE</sub> =5V	50	-	600	%
V <sub>CE(sat)</sub>		Collector-Emitter Saturation Voltage	I <sub>F</sub> =20mA, I <sub>C</sub> =1mA	-	0.1	0.2	V
R <sub>ISO</sub>		Isolation Resistance	DC500V, 40~60%R.H.	5x10 <sub>10</sub>	1x10 <sub>11</sub>	-	Ω
C <sub>f</sub>		Floating Capacitance	V=0, f=1MHz	-	0.6	1.0	pF
F <sub>c</sub>		Cut-off Frequency	V <sub>CE</sub> =5V, I <sub>C</sub> =2mA, R <sub>L</sub> =100Ω, -3dB	-	80	-	kHz
T <sub>r</sub>		Rise Time	V <sub>CE</sub> =2V, I <sub>C</sub> =2mA, R <sub>L</sub> =100Ω	-	4	18	μs
T <sub>f</sub>		Fall Time	V <sub>CE</sub> =2V, I <sub>C</sub> =2mA, R <sub>L</sub> =100Ω	-	3	18	μs

**Note 3:** CTR=I<sub>C</sub>/I<sub>F</sub> x 100%

### SIMPLIFIED BLOCK DIAGRAM



### Electrical/Optical Characteristics Condition

Fig.1 Forward Current vs. Ambient Temperature

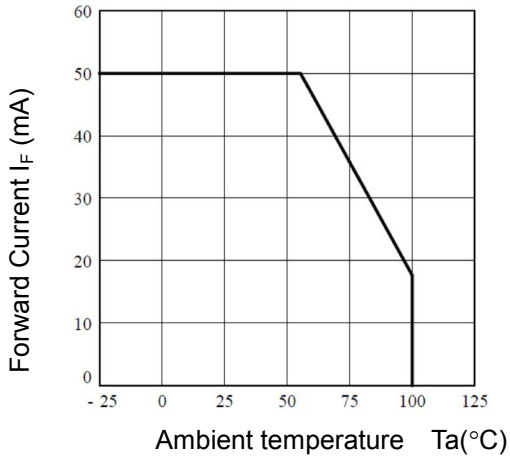


Fig.2 Collector Power Dissipation vs. Ambient Temperature

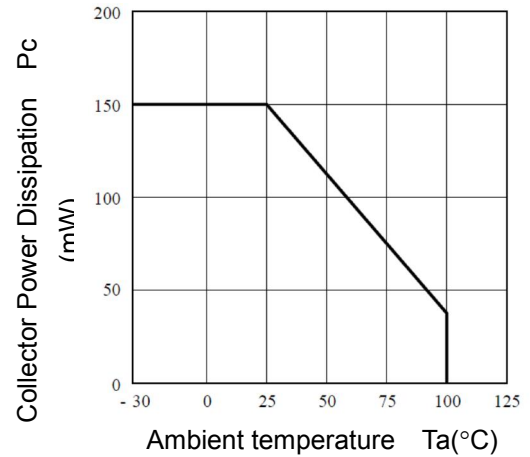


Fig.3 Forward Current vs. Ambient Temperature

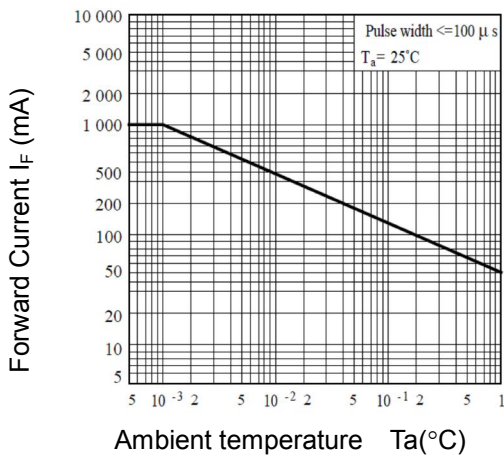


Fig.4 Current Transfer Ratio vs. Forward Current

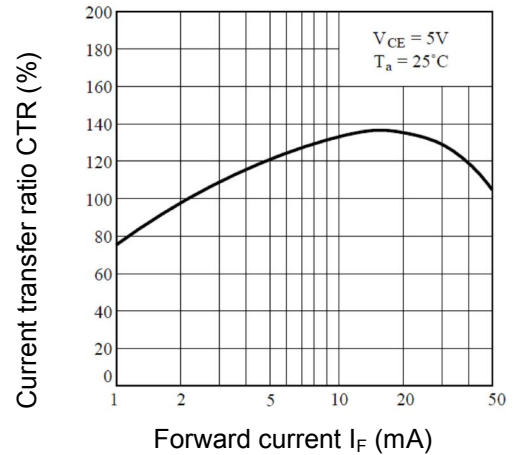


Fig.5 Forward Current vs. Forward Voltage

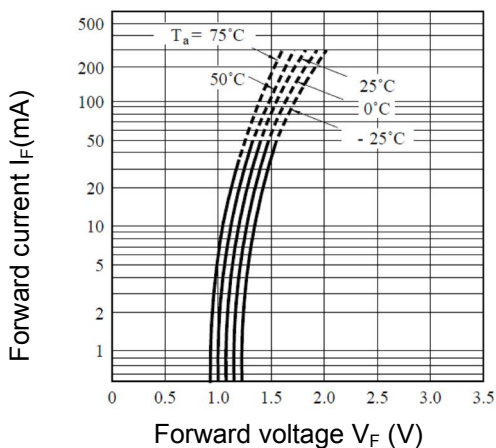


Fig.6 Collector Current vs. Collector-emitter Voltage

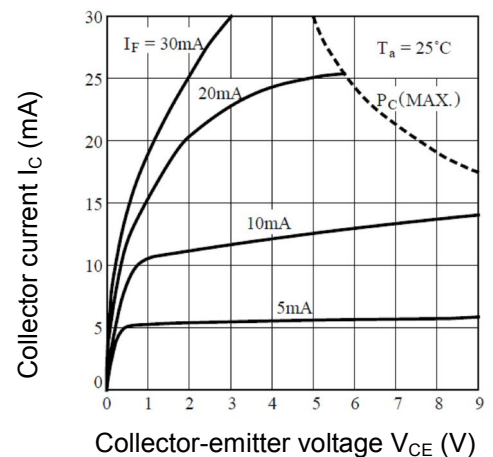


Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

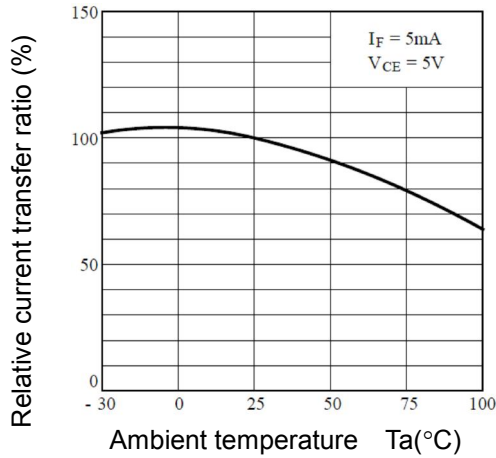


Fig.8 Collector-emitter Saturation Voltage vs. Ambient Temperature

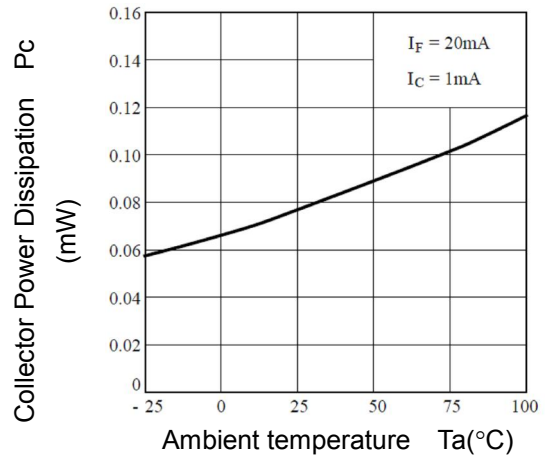


Fig.9 Collector Dark Current vs. Ambient Temperature

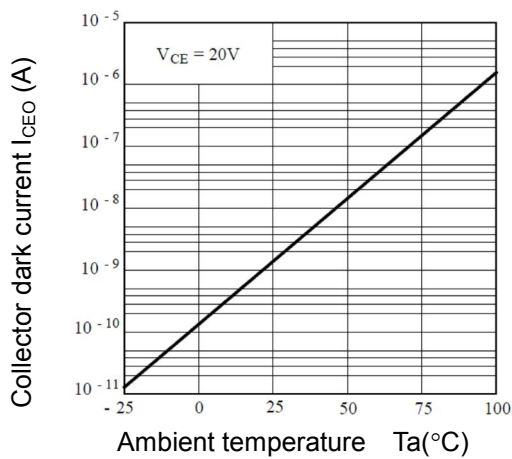


Fig.10 Response Time vs. Load Resistance

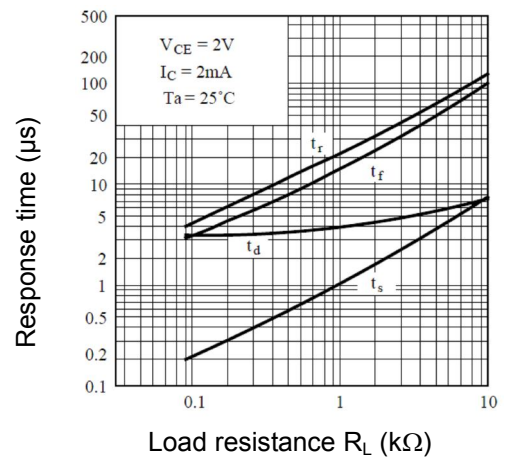


Fig.11 Frequency Response

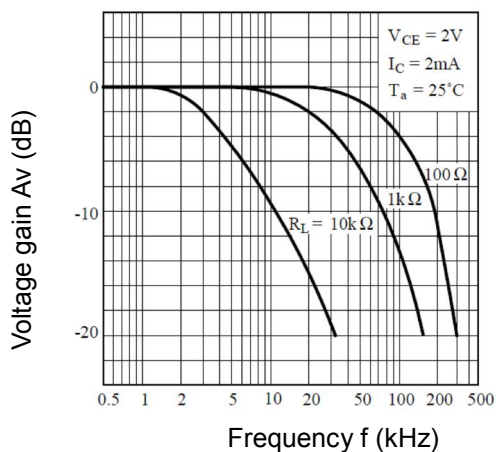
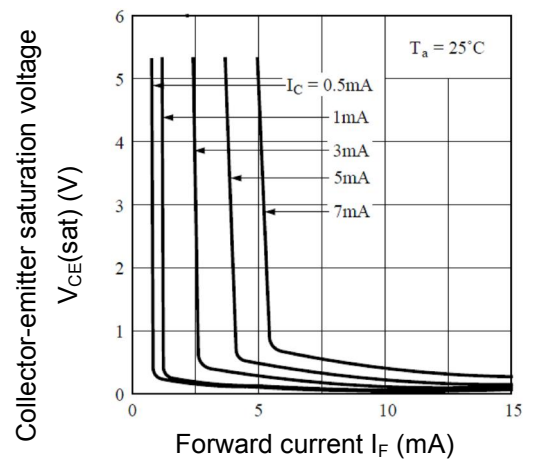
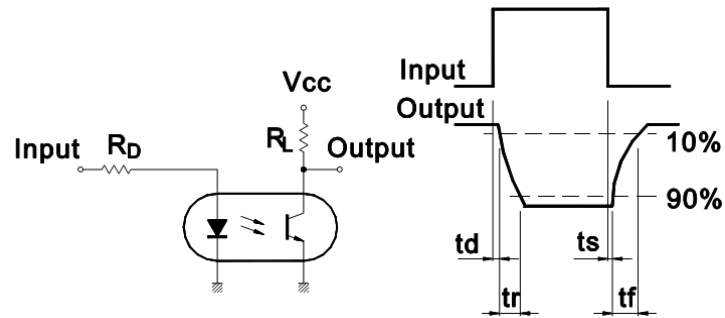


Fig.12 Collector-emitter Saturation Voltage vs. Forward Current

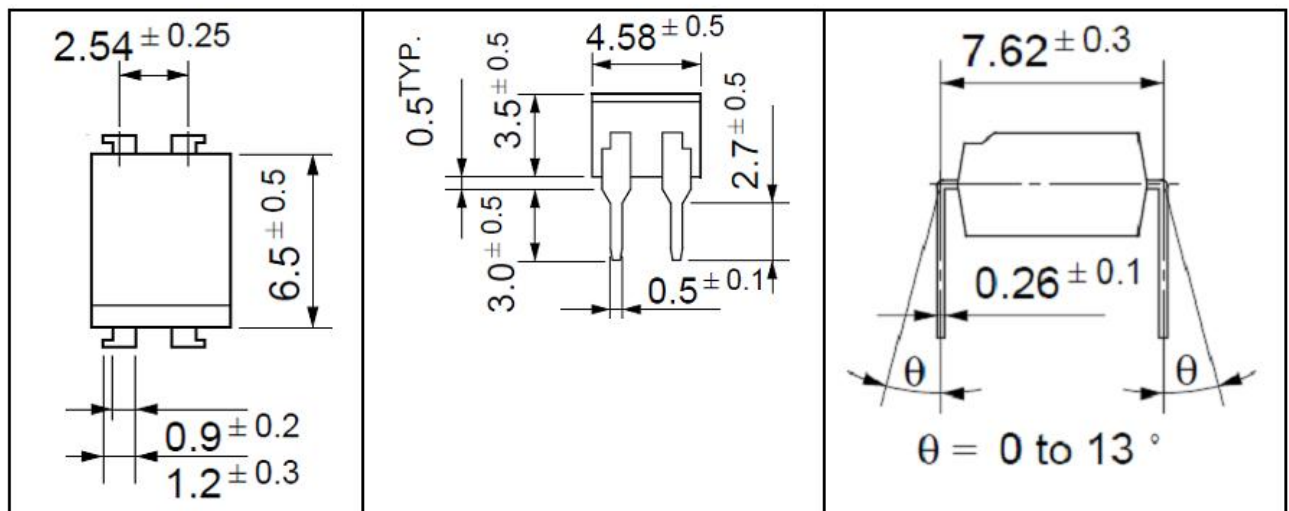




Test circuit for response time

### PACKAGE INFORMATION

#### Outline Dimensions



4-pin DIP