(Unit: mm)

# **PC817 Series**

# High Density Mounting Type Photocoupler

\*\* Lead forming type (I type) and taping reel type (P type) are also available. (PC817I/PC817P) (Page 656)
\*\*\*TÜV (VDE0884) approved type is also available as an option.

#### Features

1. Current transfer ratio

(CTR: MIN. 50% at  $I_F=5mA$ )

2. High isolation voltage between input and output ( $V_{iso}$ : 5 000 $V_{rms}$ )

3. Compact dual-in-line package

PC817: 1-channel type PC827: 2-channel type PC837: 3-channel type PC847: 4-channel type

4. Recognized by UL, file No. E64380

### Applications

- 1. Computer terminals
- 2. System appliances, measuring instruments
- Registers, copiers, automatic vending machines
- 4. Electric home appliances, such as fan heaters, etc.
- Medical instruments, physical and chemical equipment
- Signal transmission between circuits of different potentials and impedances

Outline Dimensions

PC817 PC827 Internal connection diagram Internal connection diagram 2.54 ± 0.25 2.54 ± 0.25 8 0 6 5 (4) (3) (8) (7) (6) (5) CTR PC817 rank mark Anode mark Anode mark ② ③ 0.9±0.2 2115 3 4 **②** 2 (1)(3) Anode 0.9 ± 0.2 24 Cathode 1.2 ± 0.3 (5)(7) Emitter 7.62<sup>±0.3</sup> 68 Collector  $7.62 \pm 0.3$ 4.58 <sup>± 0.5</sup> 0.5TYP. 3.5 ± 0.5 9.66<sup>±0.5</sup> 0.5TYP. Anode 3.5 2 Cathode  $0.26^{\pm0.1}$ 0.26<sup>±0.1</sup> 3 Emitter (4) Collector 0.5<sup>±0.1</sup> θ=0 to 13°  $0.5^{\pm0.1}$  $\theta = 0$  to 13° PC837 PC847 Internal connection Internal connection diagram  $2.54^{\pm0.25}$ diagram 2.54 ± 0.25 mark 000980 (6) (5) (4 (3 (2 (1) (0) 9) @ 0 (0) (9) (8) (7) (6 (3 (3 (2 () (0 9 3 4 2 6 2 6 2 6 4 4 14 27 14 27 14 1 2 3 4 5 6 7 8 2 3 4 5 6 7 8 ①35 Anode 2 3 4 5 6 246 Cathode 0.9±0.2 0.9±0.2 79(1) Emitter 1.2<sup>±0.3</sup> 1.2 <sup>±</sup> 0.3 800 Collector 19.82 ± 0.5  $7.62^{\pm0.3}$ 14.74 ± 0.5 0.26±0.  $0.26^{\pm0.1}$ 0.5<sup>±0.1</sup> ①357 Anode 90036 Emitter  $\dot{\theta}$ =0 to 13° 2(4)(6)(8) Cathode @(2)(4)(6) Collector

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"In the absence of confirmation by device specification sheets, SHARP takes no responsibility for any defects that occur in equipment using any of SHARP's devices, shown in catalogs, data books, etc. Contact SHARP in order to obtain the latest version of the device specification sheets before using any SHARP's device."

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## ■ Absolute Maximum Ratings

 $(Ta=25^{\circ}C)$ 

1001.	Parameter	Symbol	Rating	Unit
Input -	Forward current	$I_{\mathrm{F}}$	50	mA
	*1Peak forward current	IFM	1	A
	Reverse voltage	VR	6	V
	Power dissipation	P	70	mW
Output -	Collector-emitter voltage	VCEO	35	V
	Emitter-collector voltage	Veco	6	V
	Collector current	Ic	50	mA
	Collector power dissipation	Pc	150	mW
Total power dissipation		Ptot	200	mW
*2Isolation voltage		Viso	5 000	$V_{\rm rms}$
Operating temperature		$T_{ m opr}$	-30 to +100	°C
Storage temperature		$T_{\text{stg}}$	-55 to +125	°C-
*3Soldering temperature		Tsol	260	°C

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#### **■ Electro-optical Characteristics**

(Ta=25℃)

	Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage	$V_{\mathrm{F}}$	$I_F = 20 \text{mA}$	JU'	1.2	1.4	V
	Peak forward voltage	$V_{FM}$	I <sub>FM</sub> =0.5A	~ OAV		3.0	V
	Reverse current	$I_R$	$V_R = 4V$		727	10	μΑ
	Terminal capacitance	Ct	V=0, $f=1kHz$	1 Cal	30	250	pF
Output	Collector dark current	t ICEO	$V_{CE} = 20V$	<u>-</u> 01	1.7	$10^{-7}$	Α
Transfer charac- teristics	*4Current transfer ratio	CTR	I <sub>F</sub> =5mA, V <sub>CE</sub> =5V	50		600	%
	Collector-emitter saturation vo.	ltage V <sub>CE(sat)</sub>	I <sub>F</sub> =20mA, I <sub>C</sub> =1mA		0.1	0.2	V
	Isolation resistance	Riso	DC500V, 40 to 60%RH	5×10 <sup>10</sup>	1011	77"_	Ω
	Floating capacitance	Cf	V=0, f=1MHz	- ~ C	0.6	1.0	pF
	Cut-off frequency	fc	$V_{CE} = 5V, I_C = 2mA, R_L = 100\Omega, -3dB$	1005	80	7 '-	kHz
	Rise time	time t <sub>r</sub>	$V_{CE}=2V$ , $I_C=2mA$ , $R_L=100\Omega$	Lony.	4	18	μs
	Response time Fall t	time t <sub>f</sub>		1200	3	18	μs

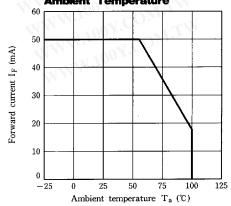
<sup>\*4</sup> Classification table of current transfer ratio is shown below.

Model No.	Rank mark	CTR (%)
PC817A	A A	80 to 160
PC817B	В	130 to 260
PC817C	C	200 to 400
PC817D	D	300 to 600
PC8 × 7AB	A or B	80 to 260
PC8 × 7BC	B or C	130 to 400
PC8 × 7CD	C or D	200 to 600
PC8※7AC	A, B or C	80 to 400
PC8 × 7BD	B, C or D	130 to 600
PC8 × 7AD	A, B, C or D	80 to 600
PC8※7	A, B, C, D or No mark	50 to 600

**※** ∶1 or 2 or 3 or 4

Fig. 1 Forward Current vs.

Ambient Temperature



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<sup>\*1</sup> Pulse width  $\leq 100 \,\mu$ s, Duty ratio = 0.001

<sup>\*2 40</sup> to 60%RH, AC for 1 minute

<sup>\*3</sup> For 10 seconds

Fig. 2 Collector Power Dissipation VS.
Ambient Temperature

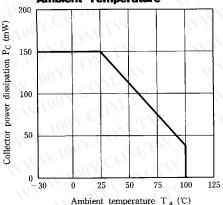


Fig. 4 Current Transfer Ratio vs. Forward Current

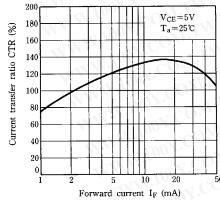


Fig. 6 Collector Current vs. Collector-emitter Voltage

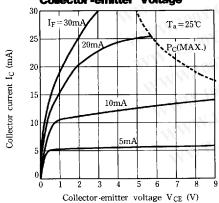


Fig. 3 Peak Forward Current vs. Duty Ratio

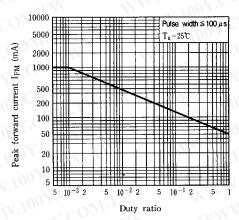


Fig. 5 Forward Current vs. Forward Voltage

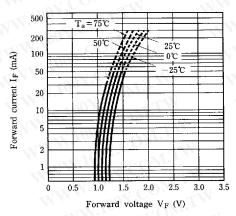
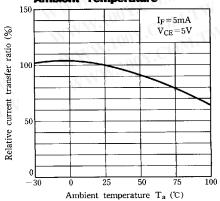


Fig. 7 Relative Current Transfer Ratio vs. Ambient Temperature



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

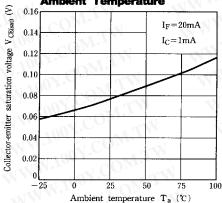
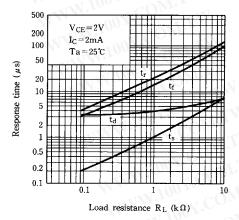
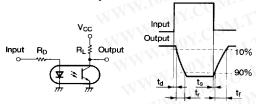


Fig.10 Response Time vs. Load Resistance



Test Circuit for Response Time



Test Circuit for Frepuency Response

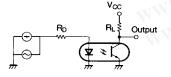


Fig. 9 Collector Dark Current vs. Ambient Temperature

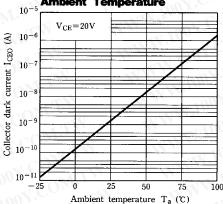


Fig.11 Frequency Response

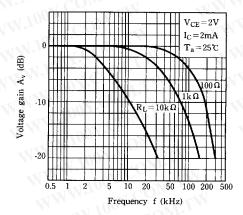
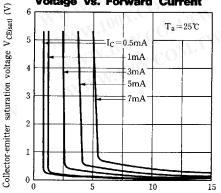


Fig.12 Collector-emitter Saturation
Voltage vs. Forward Current



Forward current IF (mA)

• Please refer to the chapter "Precautions for Use" (Page 78 to 93)

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