PC818

High Density Mounting Type Photocoupler

❈ Lead forming type （I type ）and taping reel type （P type ）are also available. （**PC818I/PC818P** ）

❈❈ TÜV （VDE0884 ）approved type is also available as an option.

■ Features

1. High isolation voltage between input and output
   （V_{iso} : 5 000V $_{rms}$ ）
2. Low collector dark current
   （I_{CEO} : MAX. 6 x 10^{-9}A at V_{CE} = 5V ）
3. Current transfer ratio
   （CTR : MIN. 10% at I_F = 1mA, V_{CE} = 0.4V ）
4. Compact dual-in-line package
5. Recognized by UL, file No. E64380

■ Applications

1. Computer terminals
2. System appliances, measuring instruments
3. Copiers, automatic vending machines,
   medical instruments
4. Signal transmission between circuits of
   different potentials and impedances

■ Outline Dimensions　　　（ Unit : mm ）

| ① | Anode | ③ | Emitter |
| ② | Cathode | ④ | Collector |
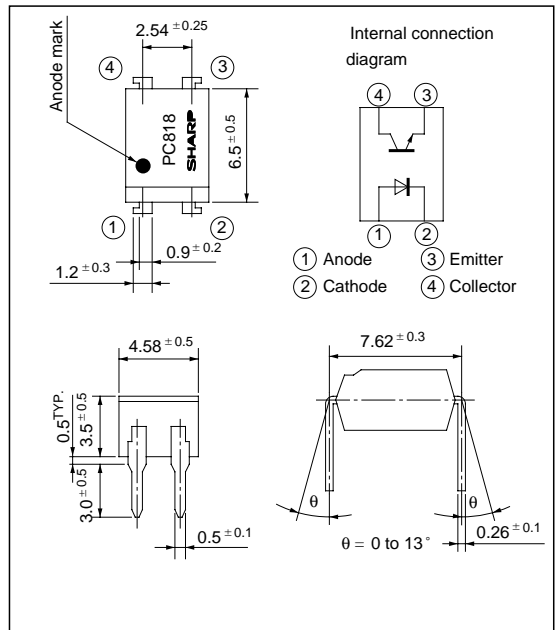
■ Absolute Maximum Ratings　　　（Ta = 25°C ）

	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}	$V_{CE} = 5V, I_F = 0$	-	-	6×10^{-9}	A
Transfer charac-teristics	Current tranfer ratio		CTR	$I_F = 1mA, V_{CE} = 0.4V$	10	30	100	%
	Collector-emitter saturation voltage		$V_{CE(sat)}$	$I_F = 20mA, I_C = 1mA$	-	0.2	0.4	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
	Turn-off time		t_{off}	$V_{CC} = 5V, I_F = 1mA, R_L = 110k\Omega$	-	-	650	μs
	Response time	Rise time	t_r	$V_{CE} = 2V, I_C = 2mA, R_L = 1k\Omega$	-	7	40	μs
		Fall time	t_f		-	6	40	μs

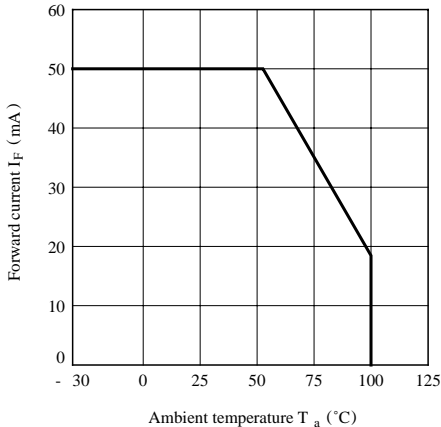### Fig. 1 Forward Current vs. Ambient Temperature

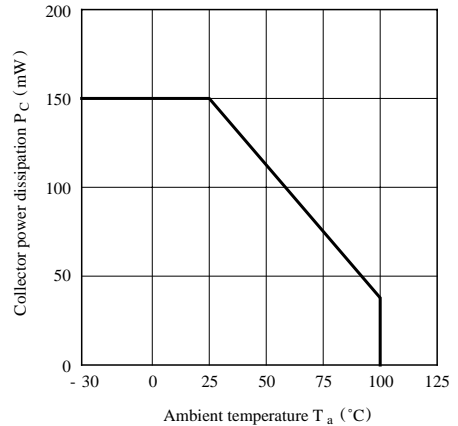### Fig. 2 Collector Power Dissipation vs. Ambient Temperature
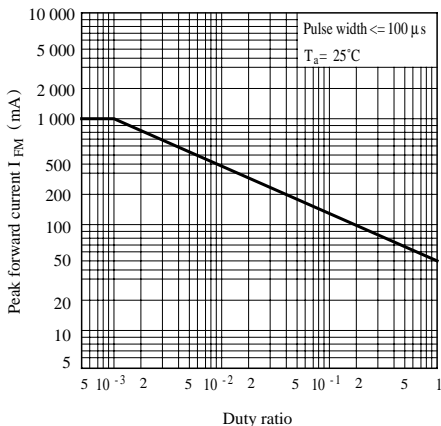

Fig. 3 Peak Forward Current vs. Duty Ratio

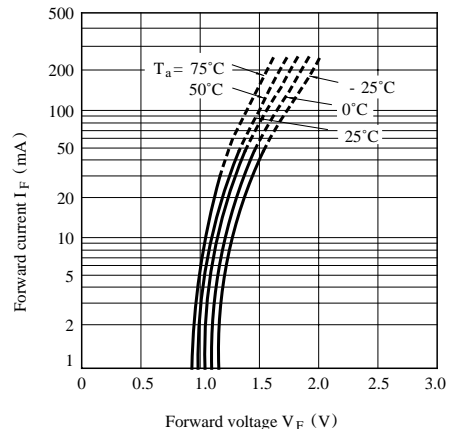### Fig. 4 Forward Current vs. Forward Voltage
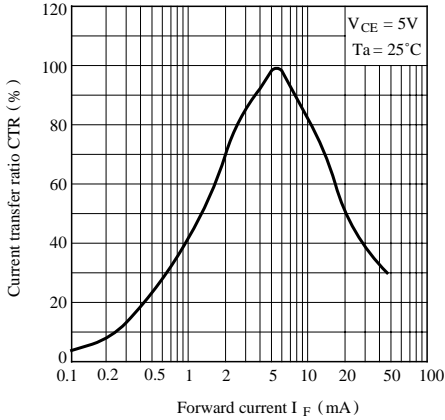
**Fig. 5 Current Transfer Ratio vs.
Forward Current**

Current transfer ratio CTR (%)

$V_{CE} = 5V$
$Ta = 25°C$

Forward current I_F (mA)

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

Collector current I_C (mA)

$Ta = 25°C$
P_C (MAX.)
$I_F = 30mA$
20mA
10mA
5mA
1mA

Collector-emitter voltage V_{CE} (V)
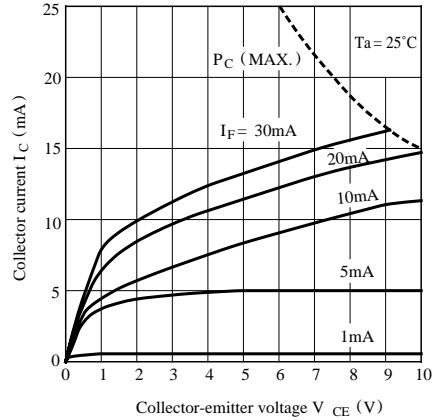
**Fig. 7 Relative Current Transfer Ratio vs.
Ambient Temperature**

Relative current transfer ratio (%)

(1) $I_F = 5mA$, $V_{CE} = 5V$
(2) $I_F = 1mA$, $V_{CE} = 0.4V$

(1)
(2)

Ambient temperature T_a (°C)
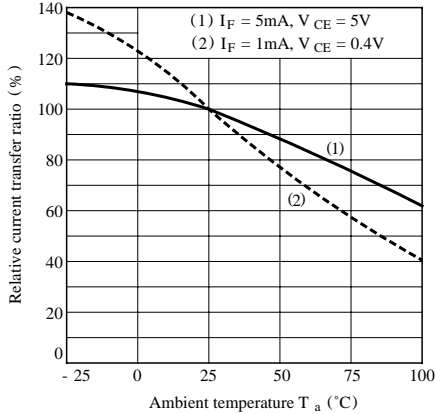
**Fig. 8 Collector-emitter Saturation Voltage
vs. Ambient Temperature**

Collector-emitter saturation voltage $V_{CE(sat)}$ (V)

$I_F = 20mA$
$I_C = 1mA$

Ambient temperature T_a (°C)
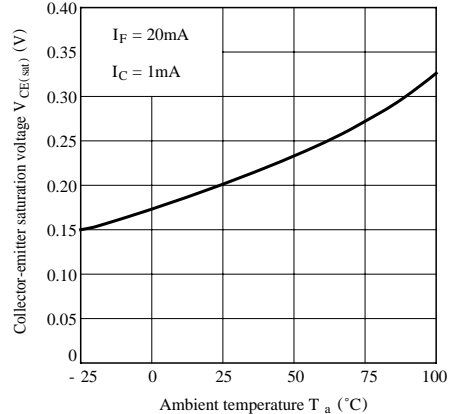
**Fig. 9 Collector Dark Current vs.
Ambient Temperature**

Collector dark current I_{CEO} (A)

$V_{CE} = 20V$ 5V

Ambient temperature T_a (°C)
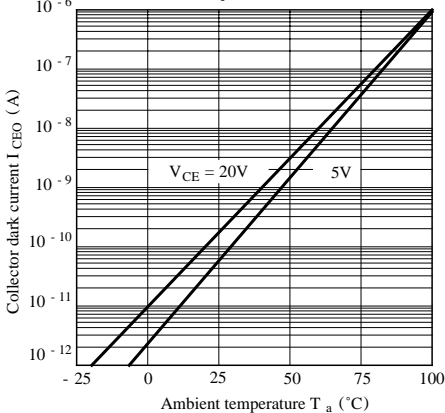
Fig.10 Response Time vs. Load Resistance

Response time (μs)

$V_{CE} = 2V$
$I_C = 2mA$
$T_a = 25°C$

t_r
t_f
t_d
t_s

Load resistance R_L (kΩ)
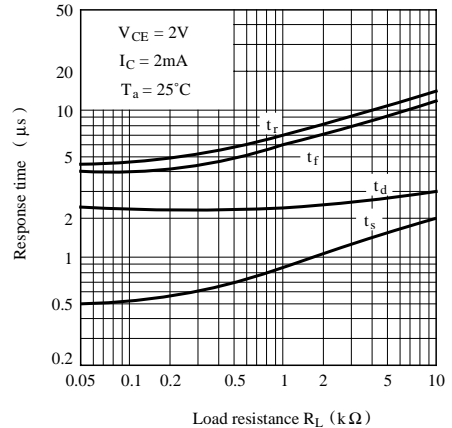
Fig.11 Frequency Response

$V_{CE} = 5V$
$I_C = 2mA$
$Ta = 25°C$

Voltage gain A_V (dB)

$R_L = 10k\Omega$ $1k\Omega$ 100Ω
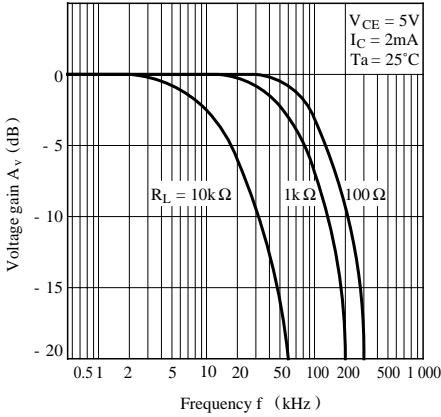
Frequency f （kHz）

Test Circuit for Response Time

V_{CC}

Input R_D R_L Output

Input
Output
10%
90%
t_d t_s
t_r t_f
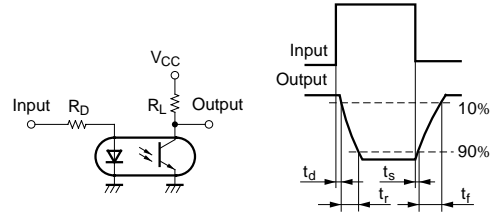
Fig.12 Collector-emitter Saturation Voltage vs. Forward Current

Collector-emitter saturation voltage $V_{CE(sat)}$ (V)

$I_C = 0.5mA$
$1mA$
$2mA$
$3mA$
$5mA$

$T_a = 25°C$

Forward current I_F （mA）
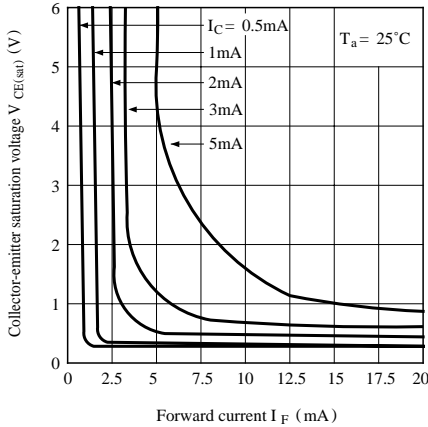
Test Circuit for Frepuency Response

V_{CC}

R_D R_L Output
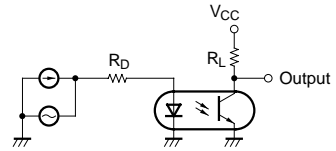
● Please refer to the chapter "Precautions for Use"

NOTICE

● The circuit application examples in this publication are provided to explain representative applications of SHARP devices and are not intended to guarantee any circuit design or license any intellectual property rights. SHARP takes no responsibility for any problems related to any intellectual property right of a third party resulting from the use of SHARP's devices.

● Contact SHARP in order to obtain the latest device specification sheets before using any SHARP device. SHARP reserves the right to make changes in the specifications, characteristics, data, materials, structure, and other contents described herein at any time without notice in order to improve design or reliability. Manufacturing locations are also subject to change without notice.

● Observe the following points when using any devices in this publication. SHARP takes no responsibility for damage caused by improper use of the devices which does not meet the conditions and absolute maximum ratings to be used specified in the relevant specification sheet nor meet the following conditions:

(i) The devices in this publication are designed for use in general electronic equipment designs such as:
— Personal computers
— Office automation equipment
— Telecommunication equipment [terminal]
— Test and measurement equipment
— Industrial control
— Audio visual equipment
— Consumer electronics

(ii) Measures such as fail-safe function and redundant design should be taken to ensure reliability and safety when SHARP devices are used for or in connection with equipment that requires higher reliability such as:
— Transportation control and safety equipment (i.e., aircraft, trains, automobiles, etc.)
— Traffic signals
— Gas leakage sensor breakers
— Alarm equipment
— Various safety devices, etc.

(iii) SHARP devices shall not be used for or in connection with equipment that requires an extremely high level of reliability and safety such as:
— Space applications
— Telecommunication equipment [trunk lines]
— Nuclear power control equipment
— Medical and other life support equipment (e.g., scuba).

● Contact a SHARP representative in advance when intending to use SHARP devices for any "specific" applications other than those recommended by SHARP or when it is unclear which category mentioned above controls the intended use.

● If the SHARP devices listed in this publication fall within the scope of strategic products described in the Foreign Exchange and Foreign Trade Control Law of Japan, it is necessary to obtain approval to export such SHARP devices.

● This publication is the proprietary product of SHARP and is copyrighted, with all rights reserved. Under the copyright laws, no part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose, in whole or in part, without the express written permission of SHARP. Express written permission is also required before any use of this publication may be made by a third party.

● Contact and consult with a SHARP representative if there are any questions about the contents of this publication.