

PC451

Mini-Flat Package, High Collector-emitter Voltage Type Photocoupler

■ Features

1. High collector-emitter voltage
V_{CEO}:350V
2. Soldering reflow type
3. Recognized by UL, file No. E64380

■ Applications

1. Telephones
2. Modems

■ Package Specifications

Model No.	Package specification	Diameter of reel	Tape width
PC451	Taping package (3 000pcs.)	φ370mm	13.5mm
PC451T	Taping package (750pcs.)	φ180mm	13.5mm
PC451Z	Sleeve package (100pcs.)	—	—

■ Absolute Maximum Ratings (Ta=25°C)

	Parameter	Symbol	Rating	Unit
Input	*1 Forward current	I _F	50	mA
	Reverse voltage	V _R	6	V
	*1 Power dissipation	P	70	mW
Output	Collector-emitter voltage	V _{CEO}	350	V
	Emitter-collector voltage	V _{ECO}	6	V
	Collector current	I _C	50	mA
	*1 Collector power dissipation	P _C	150	mW
	*1 Total power dissipation	P _{tot}	170	mW
	Operating temperature	T _{opr}	-25 to +100	°C
	Storage temperature	T _{stg}	-40 to +125	°C
	*2 Isolation voltage	V _{iso (rms)}	3.75	kV
	*3 Soldering temperature	T _{sol}	260	°C

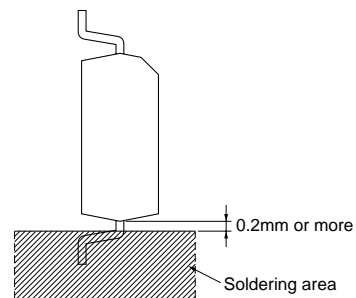
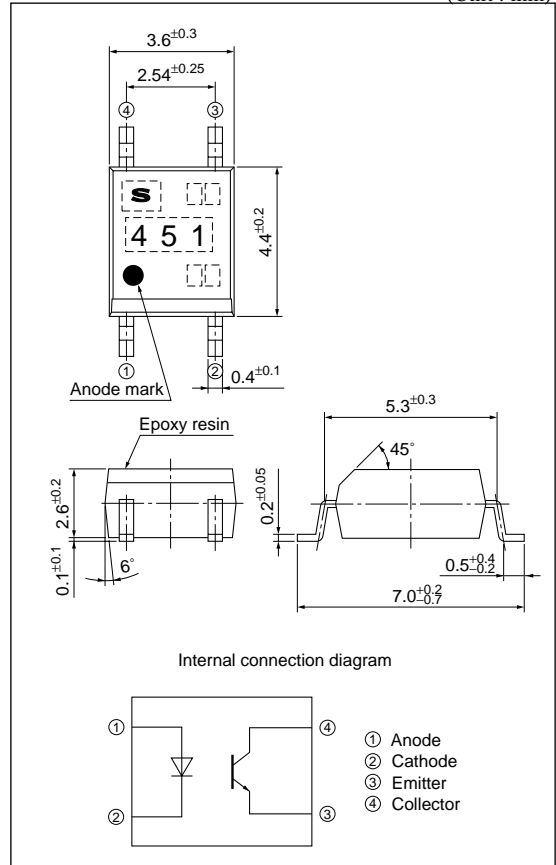
*1 The derating factors of absolute maximum ratings due to ambient temperature are shown in Fig.2 to 5

*2 40 to 60%RH, AC for 1 min

*3 For 10 s

■ Outline Dimensions

(Unit : mm)



■ Electro-optical Characteristics

(Ta=25°C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage	V_F	$I_F=20\text{mA}$	–	1.2	1.4	V
	Reverse current	I_R	$V_R=4\text{V}$	–	–	10	μA
	Terminal capacitance	C_t	$V=0, f=1\text{kHz}$	–	30	250	pF
Output	Collector dark current	I_{CEO}	$V_{CE}=200\text{V}, I_F=0$	–	–	1000	nA
	Collector-emitter breakdown voltage	BV_{CEO}	$I_C=0.1\text{mA}, I_F=0$	350	–	–	V
Transfer characteristics	Collector current	I_C	$I_F=5\text{mA}, V_{CE}=5\text{V}$	2	4	–	mA
	Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_F=20\text{mA}, I_C=1\text{mA}$	–	0.1	0.3	V
	Isolation resistance	R_{ISO}	DC500V, 40 to 60%RH	5×10^{10}	10^{11}	–	Ω
	Floating capacitance	C_f	$V=0, f=1\text{MHz}$	–	0.6	1.0	pF
	Cut-off frequency	f_c	$V_{CE}=5\text{V}, I_C=2\text{mA}, R_L=100\Omega, -3\text{dB}$	–	50	–	kHz
	Response time	Rise time	t_r	$V_{CE}=2\text{V}$ $I_C=2\text{mA}$ $R_L=100\Omega$	–	4	10
Fall time		t_f	–		5	12	μs

Fig.1 Forward Current vs. Ambient Temperature

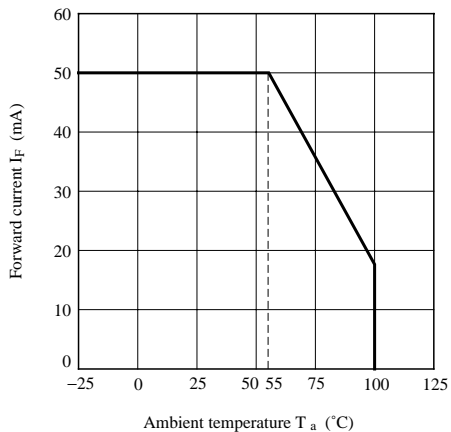


Fig.2 Diode Power Dissipation vs. Ambient Temperature

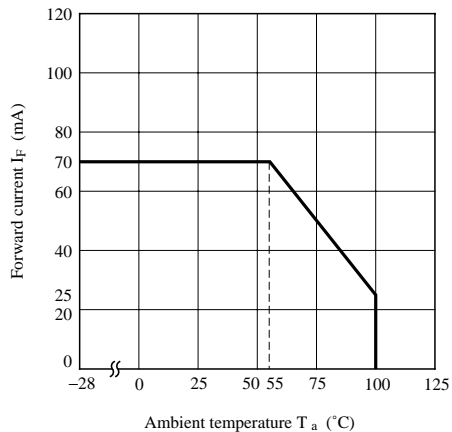


Fig.3 Collector Power Dissipation vs. Ambient Temperature

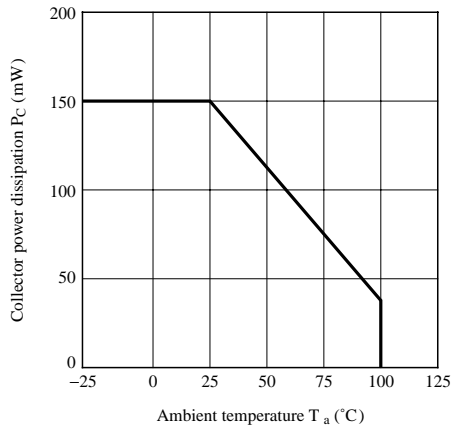


Fig.4 Power Dissipation vs. Ambient Temperature

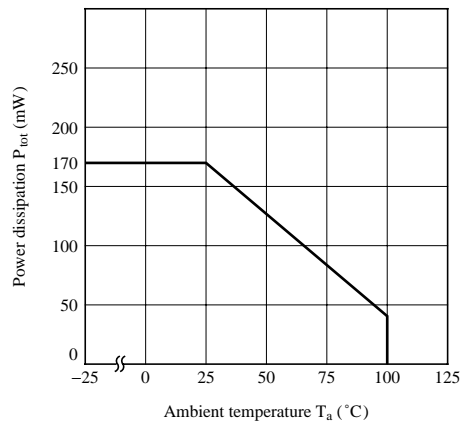


Fig.5 Peak Forward Current vs. Duty Ratio

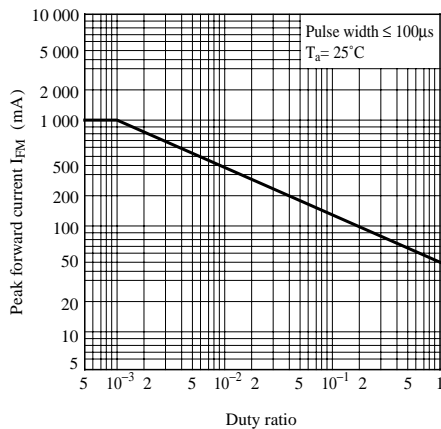


Fig.6 Forward Current vs. Forward Voltage

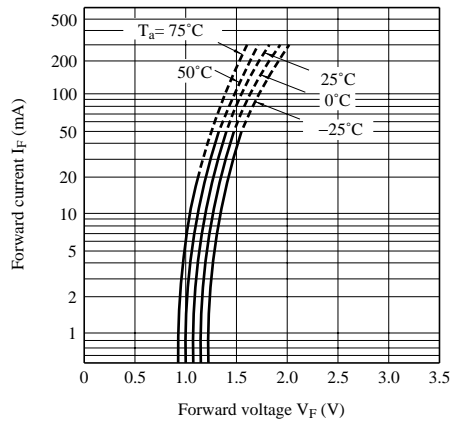


Fig.7 Current Transfer Ratio vs. Forward Current

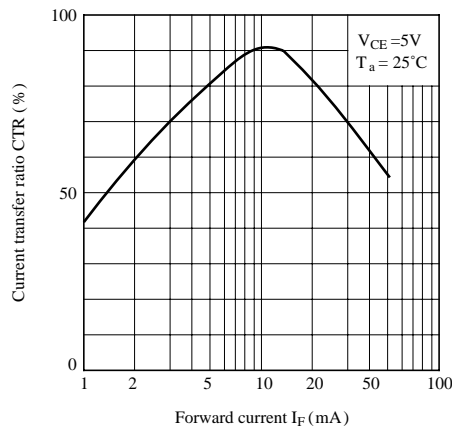


Fig.8 Collector Current vs. Collector-emitter Voltage

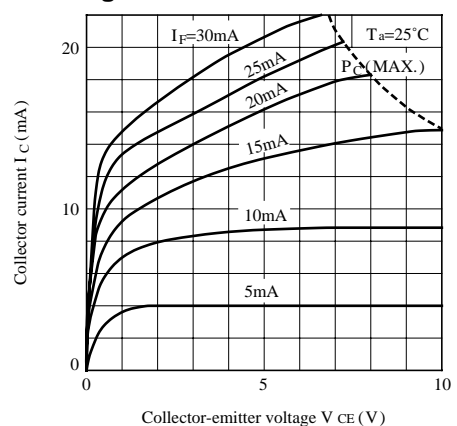


Fig.9 Relative Current Transfer Ratio vs. Ambient Temperature

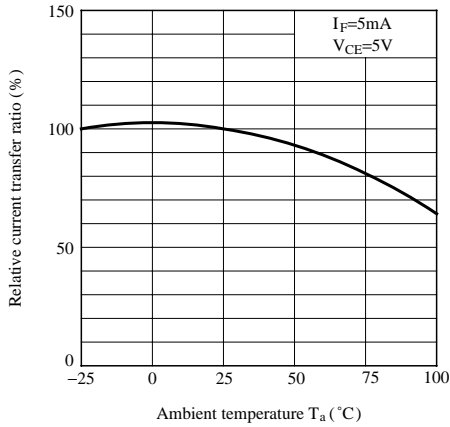


Fig.10 Collector - emitter Saturation Voltage vs. Ambient Temperature

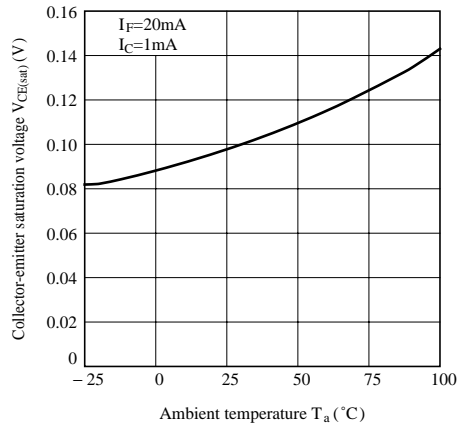


Fig.11 Collector Dark Current vs. Ambient Temperature

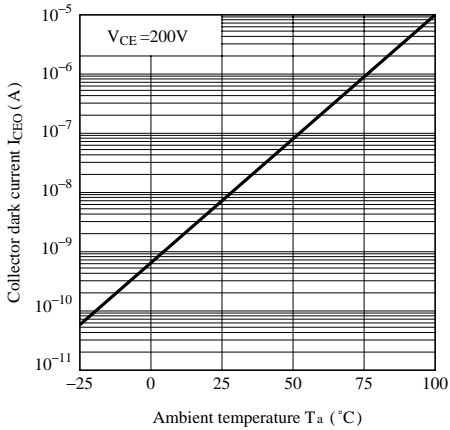


Fig.12 Response Time vs. Load Resistance

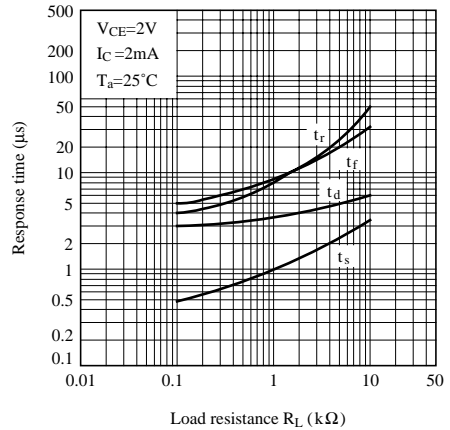


Fig.13 Test Circuit for Response Time

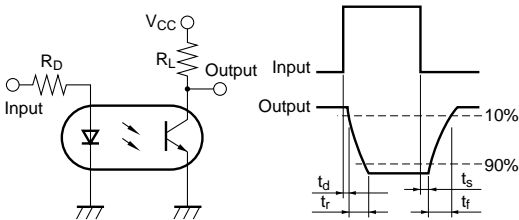


Fig.14 Voltage gain A(dB) vs. Frequency

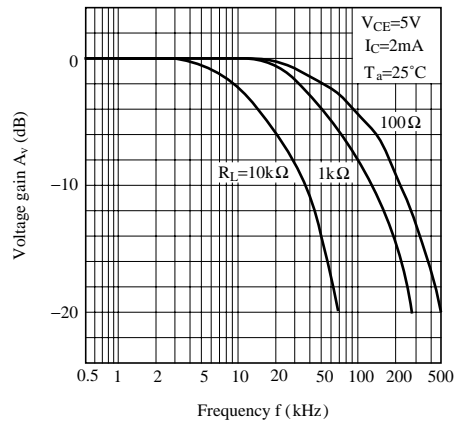


Fig.15 Test Circuit Frequency Response

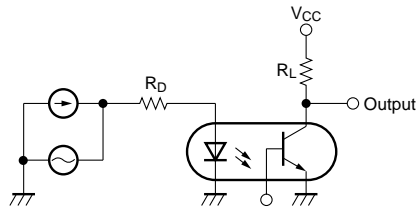
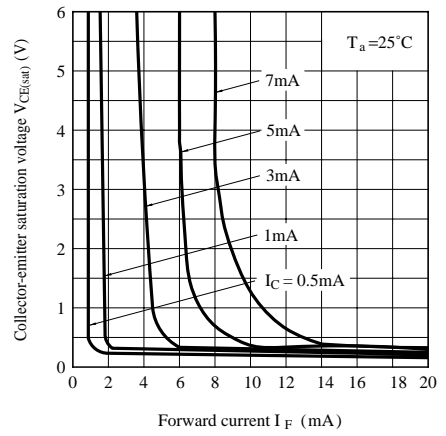


Fig.16 Collector-emitter Saturation Voltage vs. Forward Current



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.