

T-41-83

# PC511 Long Creepage Distance Type Photocoupler

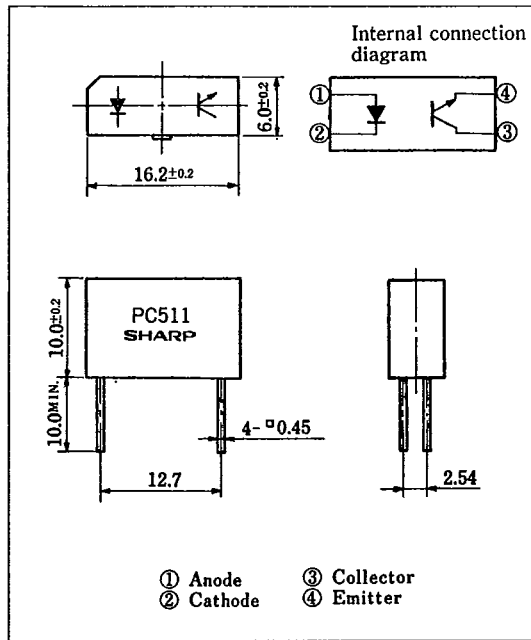
## ■ Features

1. Long creepage distance (12.3mm)
2. Current transfer ratio  
CTR: MIN. 10% at  $I_F=20\text{mA}$ ,  $V_{CE}=5\text{V}$
3. Low collector dark current  
( $I_{CEO}$ : MAX.  $10^{-7}\text{A}$  at  $V_{CE}=20\text{V}$ )
4. High isolation voltage between input and output ( $V_{iso}$  : 5,000Vrms)
5. Easy mounting on PWB
6. UL recognized, file No. E64380  
TUV approved, No. R20044

## ■ Applications

1. Switching power supplies
2. Programmable controllers
3. Electronic sewing machines, copiers, automatic vending machines
4. Electric home appliances, audio equipment

## ■ Outline Dimensions (Unit : mm)



## ■ Absolute Maximum Ratings

( $T_a=25^\circ\text{C}$ )

	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	75	mW
Output	Collector-emitter voltage	$V_{CEO}$	35	V
	Emitter-collector voltage	$V_{ECO}$	6	V
	Collector current	$I_C$	20	mA
	Collector power dissipation	$P_C$	75	mW
	*2 Isolation voltage	$V_{iso}$	5,000	Vrms
	Operating temperature	$T_{opr}$	-25 ~ +95	$^\circ\text{C}$
	Storage temperature	$T_{stg}$	-40 ~ +105	$^\circ\text{C}$
	*3 Soldering temperature	$T_{sol}$	260	$^\circ\text{C}$

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

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

\*3 For 5 seconds

SHARP

Electro-optical Characteristics

( $T_a=25^\circ\text{C}$ )

	Parameter	Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage	$V_F$	$I_F=20\text{mA}$	—	1.2	1.4	V
	Peak forward voltage	$V_{FM}$	$I_{FM}=0.5\text{A}$	—	3.0	4.0	V
	Reverse current	$I_R$	$V_R=3\text{V}$	—	—	10	$\mu\text{A}$
	Terminal capacitance	$C_t$	$V=0, f=1\text{kHz}$	—	50	250	pF
Output	Collector dark current	$I_{CE0}$	$V_{CE}=20\text{V}, I_F=0$	—	—	$10^{-7}$	A
	Current transfer ratio	CTR	$I_F=20\text{mA}, V_{CE}=5\text{V}$	10	—	100	%
Transfer characteristics	Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_F=40\text{mA}, I_C=1\text{mA}$	—	0.1	0.4	V
	Isolation resistance	$R_{ISO}$	DC500V, RH=40~60%	$10^{10}$	$10^{11}$	—	$\Omega$
	Floating capacitance	$C_f$	$V=0, f=1\text{MHz}$	—	0.5	—	pF
	Cut-off frequency	$f_c$	$V_{CE}=2\text{V}, I_C=2\text{mA}, R_L=100\Omega$	12	80	—	kHz
	Response time (Rise)	$t_r$	$V_{CE}=2\text{V}, I_C=2\text{mA}$	—	3	20	$\mu\text{s}$
	Response time (Fall)	$t_f$	$R_L=100\Omega$	—	4	30	$\mu\text{s}$

Fig. 1 Forward Current vs. Ambient Temperature

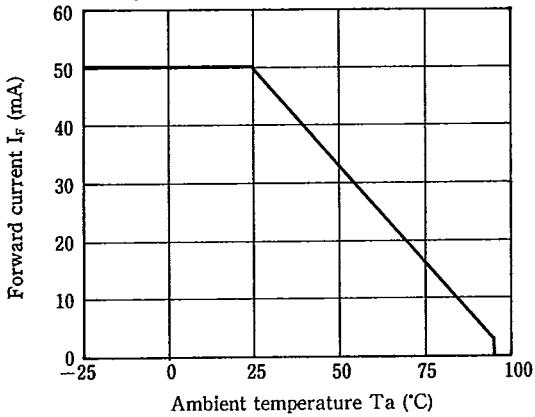


Fig. 2 Collector Power Dissipation vs. Ambient Temperature

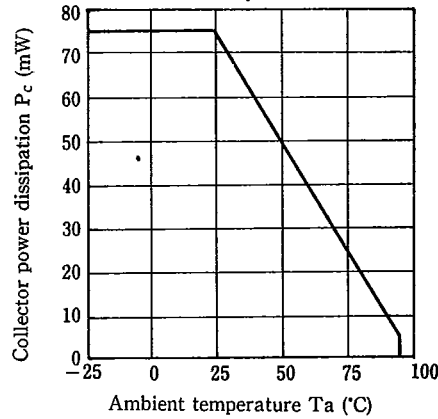


Fig. 3 Peak Forward Current vs. Duty Ratio

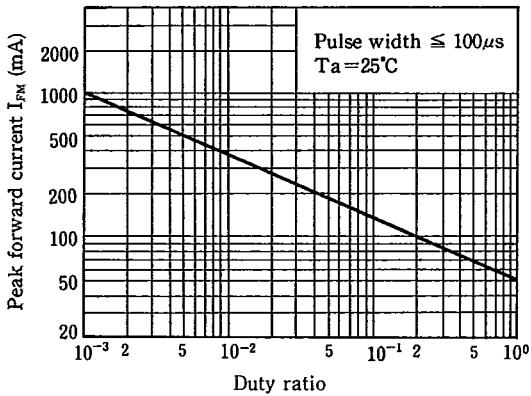
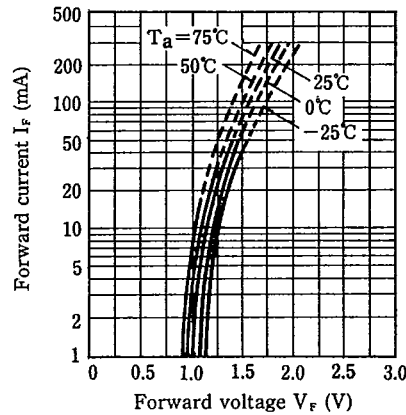


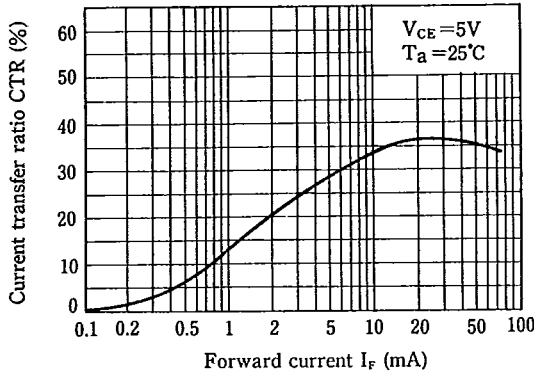
Fig. 4 Forward Current vs. Forward Voltage



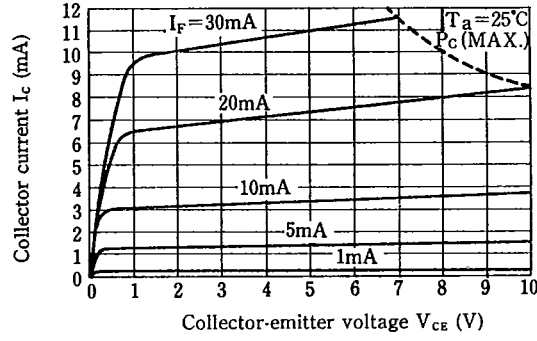
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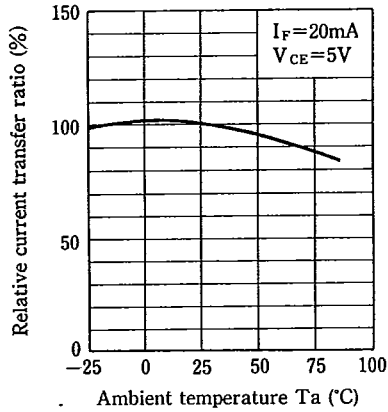
**Fig. 5 Current Transfer Ratio vs. Forward Current**



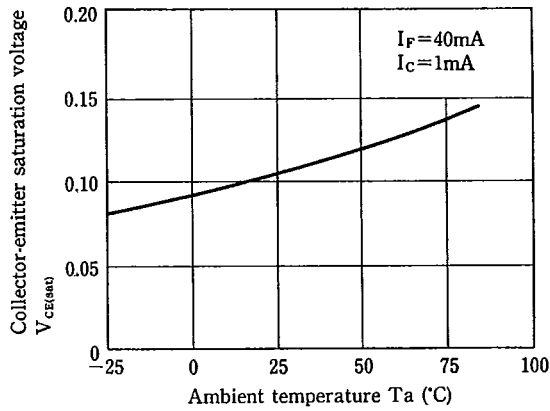
**Fig. 6 Collector Current vs. Collector-emitter Voltage**



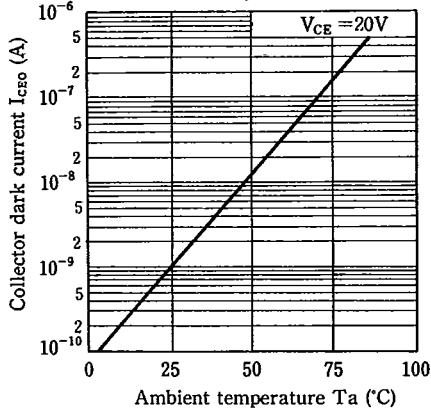
**Fig. 7 Relative Current Transfer Ratio vs. Ambient Temperature**



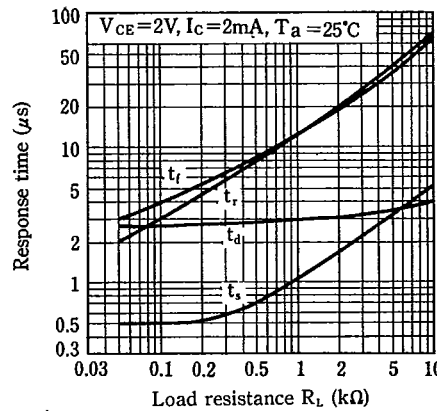
**Fig. 8 Collector-emitter Saturation Voltage vs. Ambient Temperature**



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



**Fig. 10 Response Time vs. Load Resistance**



Test Circuit for Response Time

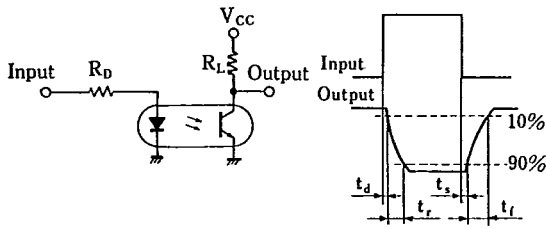


Fig. 11 Frequency Response

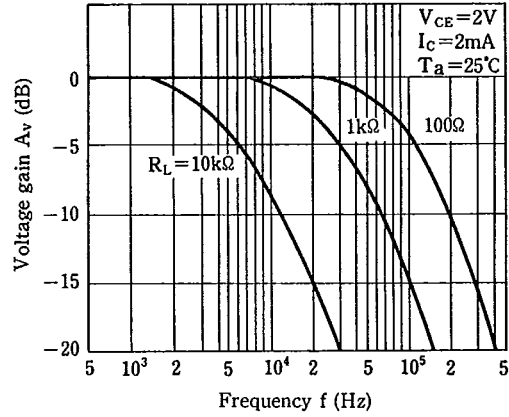
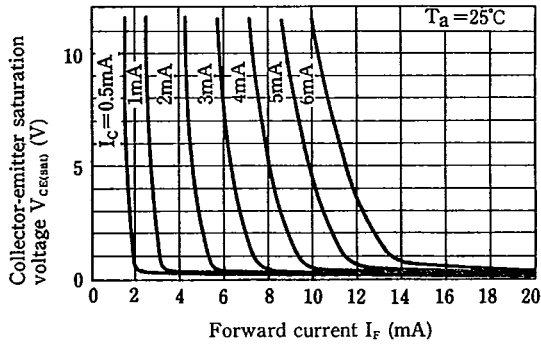
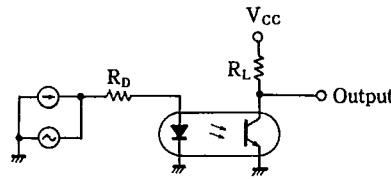


Fig. 12 Collector-emitter Saturation Voltage vs. Forward Current



Test Circuit for Frequency Response



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