

PC4N29V/PC4N30V PC4N32V/PC4N33V

High Transfer Efficiency, General Purpose Type Photocoupler

* Lead forming type (I type) is also available. (PC4N29VI/PC4N30VI/PC4N32VI/PC4N33VI) (Page 482)

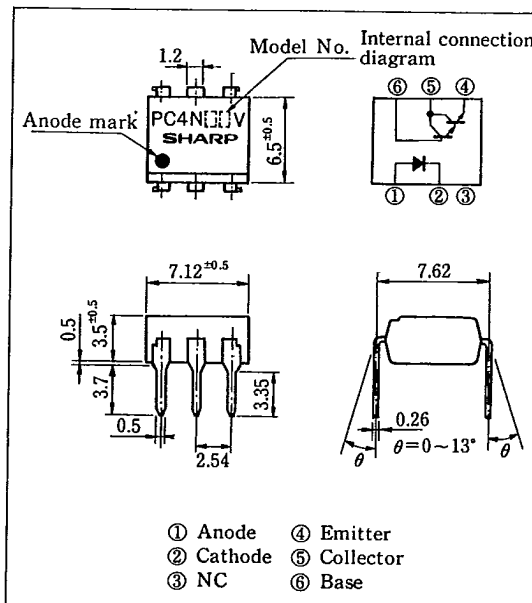
Features

- High current transfer ratio
PC4N29V, PC4N30V
(CTR : MIN. 100% at $I_F=10\text{mA}$, $V_{CE}=10\text{V}$)
PC4N32V, PC4N33V
(CTR : MIN. 500% at $I_F=10\text{mA}$, $V_{CE}=10\text{V}$)
- Response time t_{on} : MAX. $5\mu\text{s}$ at $I_F=200\text{mA}$, $V_{CC}=10\text{V}$, $I_C=50\text{mA}$
- UL recognized, file No. E64380
TÜV approved, PC4N29V/32V : No. R40184, PC4N30V/33V : No. R40185

Applications

- I/O interfaces for computers
- System appliances, measuring instruments
- Signal transmission between circuits of different potentials and impedances

Outline Dimensions (Unit : mm)



Absolute Maximum Ratings

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

Parameter		Symbol	Rating	Unit
Input	Forward current	I_F	80	mA
	*1 Peak forward current	I_{FM}	3	A
	Reverse voltage	V_R	6	V
	Power dissipation	P	150	mW
Output	Collector-emitter voltage	V_{CEO}	30	V
	Emitter-collector voltage	V_{ECO}	5	V
	Collector-base voltage	V_{CBO}	30	V
	Collector current	I_C	100	mA
	Collector power dissipation	P_C	150	mW
	Total power dissipation	P_{tot}	250	mW
*2 Isolation voltage	PC4N29V,32V	V_{iso}	2,500	Vrms
	PC4N30V,33V		1,500	
Operating temperature		T_{opr}	-55 ~ +100	$^\circ\text{C}$
Storage temperature		T_{stg}	-55 ~ +150	$^\circ\text{C}$
*3 Soldering temperature		T_{sol}	260	$^\circ\text{C}$

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

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

*3 For 10 seconds

SHARP

Electro-optical Characteristics

T-41-83

(Ta=25°C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage	V_F	$I_F=10\text{mA}$	—	1.2	1.5	V
	Reverse current	I_R	$V_R=4\text{V}$	—	—	10	μA
	Terminal capacitance	C_t	$V=0, f=1\text{kHz}$	—	50	—	pF
Output	Collector dark current	I_{CBO}	$V_{CE}=10\text{V}, I_F=0$	—	—	10^{-7}	A
	Collector-emitter breakdown voltage	BV_{CEO}	$I_C=0.1\text{mA}, I_F=0$	30	—	—	V
	Emitter-collector breakdown voltage	BV_{ECO}	$I_E=10\mu\text{A}, I_F=0$	5	—	—	V
	Collector-base breakdown voltage	BV_{CBO}	$I_C=0.1\text{mA}, I_F=0$	30	—	—	V
Transfer characteristics	Current transfer ratio	CTR	$I_F=10\text{mA}, V_{CE}=10\text{V}$ Pulse test: input pulse width = 300 μs , duty ratio ≤ 0.02	100	—	—	%
				500	—	—	
	Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_F=8\text{mA}, I_C=2\text{mA}$	—	—	1.0	V
	Isolation resistance	R_{ISO}	DC500V, RH=40~60%	5×10^{10}	10^{11}	—	Ω
	Floating capacitance	C_f	$V=0, f=1\text{MHz}$	—	1.0	—	pF
	Response time (Turn-on time)	t_{on}	$I_F=200\text{mA}$	—	—	5	μs
Response time (Turn-off time)		t_{off}	$(t_w \approx 1.0\text{ms})$ $V_{CC}=10\text{V}, I_C=50\text{mA}$	—	—	40	μs
				—	—	100	μs

Fig. 1 Forward Current vs. Ambient Temperature

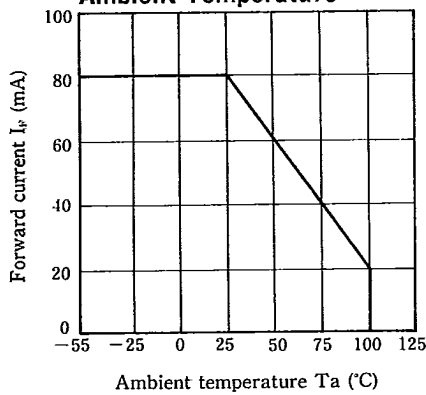


Fig. 2 Collector Power Dissipation vs. Ambient Temperature

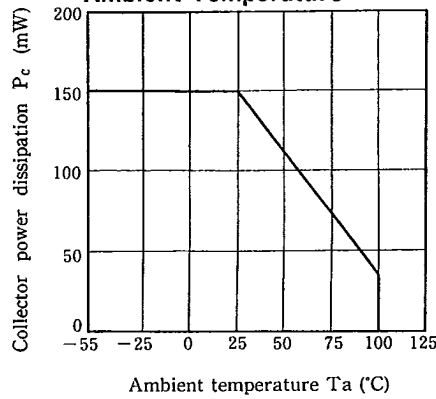


Fig. 3 Forward Current vs. Forward Voltage

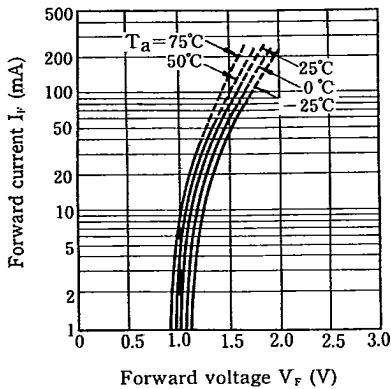
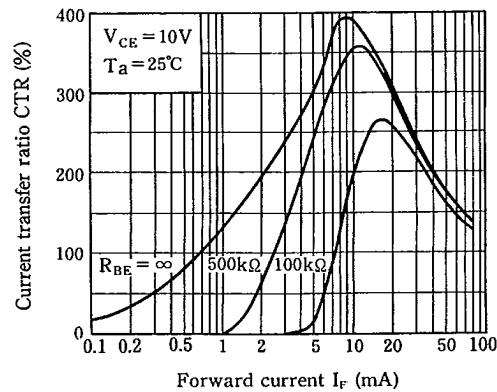


Fig. 4 Current Transfer Ratio vs. Forward Current (PC4N29V, PC4N30V)



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Fig. 5 Current Transfer Ratio vs. Forward Current (PC4N32V, PC4N33V)

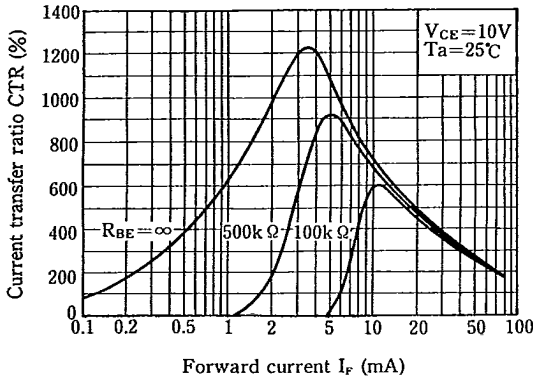


Fig. 6 Collector Current vs. Collector-emitter Voltage (PC4N29V, PC4N30V)

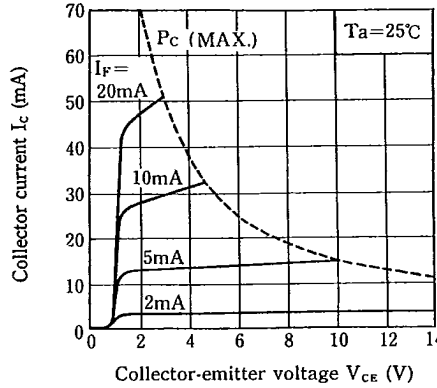


Fig. 7 Collector Current vs. Collector-emitter Voltage (PC4N32V, PC4N33V)

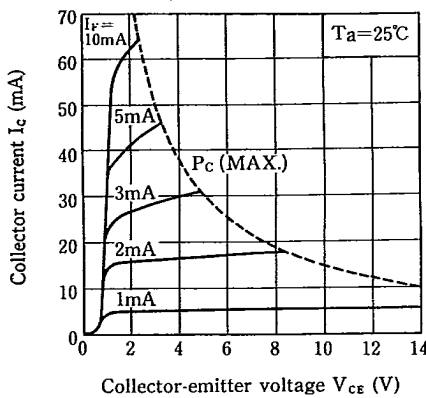


Fig. 8 Relative Current Transfer Ratio vs. Ambient Temperature

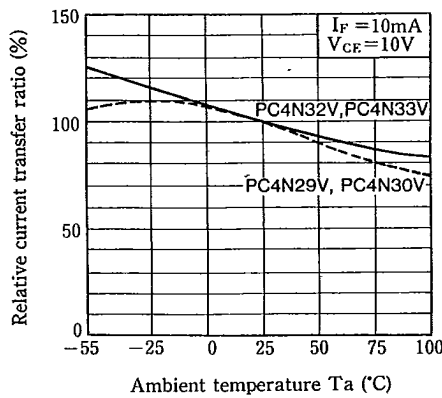


Fig. 9 Collector-emitter Saturation Voltage vs. Ambient Temperature

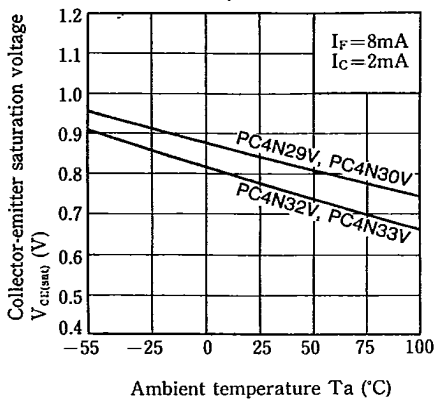


Fig. 10 Collector Dark Current vs. Ambient Temperature

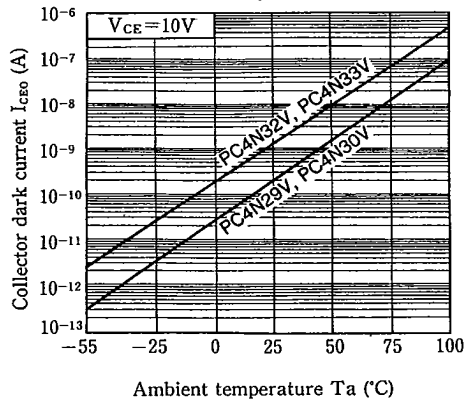


Fig. 11 Frequency Response (PC4N29V, PC4N30V)

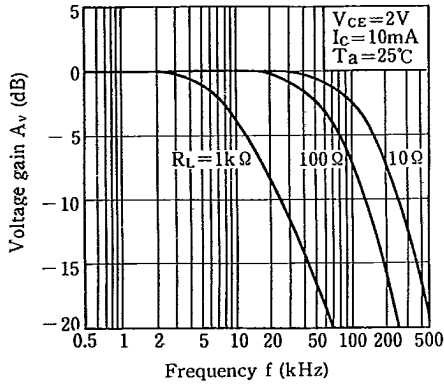


Fig. 12 Frequency Response (PC4N32V, PC4N33V)

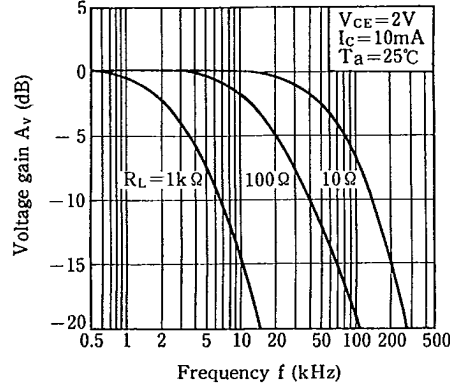


Fig. 13 Collector-emitter Saturation Voltage vs. Forward Current (PC4N29V, PC4N30V)

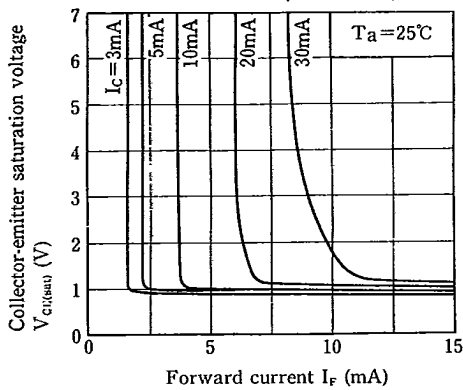
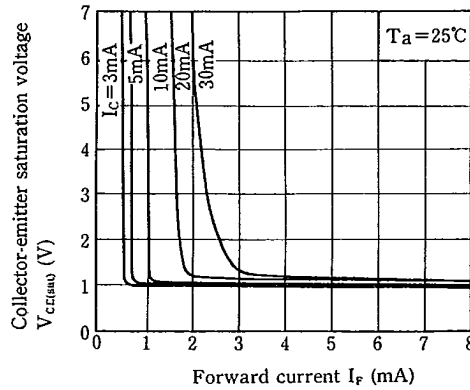
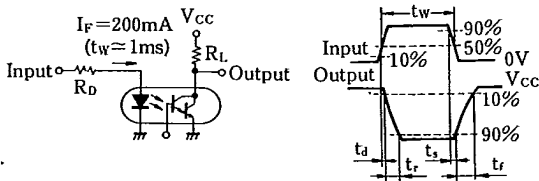


Fig. 14 Collector-emitter Saturation Voltage vs. Forward Current (PC4N32V, PC4N33V)



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Test Circuit for Response Time



Test Circuit for Frequency Response

