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)

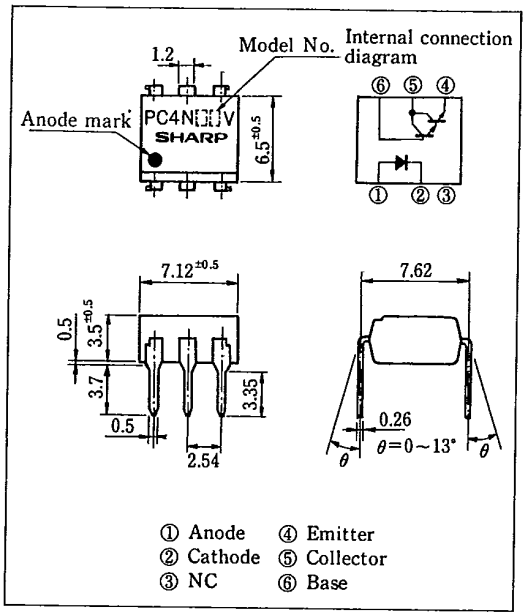
■ Features

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

■ Applications

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

■ Outline Dimensions (Unit : mm)



■ Absolute Maximum Ratings (Ta=25°C)

Parameter			Symbol	Rating	Unit
Input	Forward current		I_F	80	mA
	*1Peak 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
*2Isolation voltage		PC4N29V,32V	V_{iso}	2,500	Vrms
		PC4N30V,33V		1,500	
Operating temperature			T_{opr}	−55~+100	°C
Storage temperature			T_{stg}	−55~+150	°C
*3Soldering temperature			T_{sol}	260	°C

*1 Pulse width≦1μs, Duty ratio=0.001
*2 RH=40~60%, AC for 1 minute
*3 For 10 seconds

T-41-83

■ Electro-optical Characteristics (Ta=25°C)

Parameter			Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage		V_F	I_F=10mA	—	1.2	1.5	V
	Reverse current		I_R	V_R=4V	—	—	10	μA
	Terminal capacitance		C_t	V=0, f=1kHz	—	50	—	pF
Output	Collector dark current		I_{CEO}	V_{CE}=10V, I_F=0	—	—	10^{-7}	A
	Collector-emitter breakdown voltage		BV_{CEO}	I_C=0.1mA, I_F=0	30	—	—	V
	Emitter-collector breakdown voltage		BV_{ECO}	I_E=10μA, I_F=0	5	—	—	V
	Collector-base breakdown voltage		BV_{CBO}	I_C=0.1mA, I_F=0	30	—	—	V
Transfer characteristics	Current transfer ratio	PC4N29V,30V	CTR	I_F=10mA, V_{CE}=10V Pulse test : input pulse width=300μs, duty ratio≦0.02	100	—	—	%
		PC4N32V,33V			500	—	—	
	Collector-emitter saturation voltage		$V_{CE(sat)}$	I_F=8mA, I_C=2mA	—	—	1.0	V
	Isolation resistance		R_{ISO}	DC500V, RH=40~60%	5×10^{10}	10^{11}	—	Ω
	Floating capacitance		C_f	V=0, f=1MHz	—	1.0	—	pF
	Response time (Turn-on time)		t_{on}	I_F=200mA	—	—	5	μs
	Response time (Turn-off time)	PC4N29V,30V	t_{off}	(t_W≃1.0ms)	—	—	40	μs
		PC4N32V,33V		V_{CC}=10V, I_C=50mA	—	—	100	μs

Fig. 1 Forward Current vs. Ambient Temperature

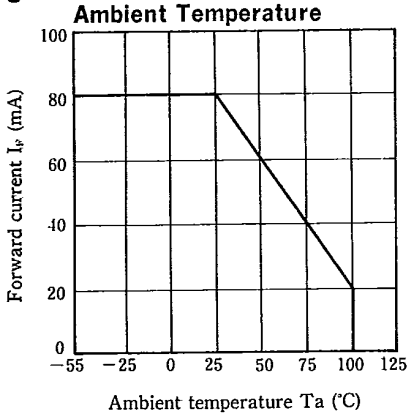


Fig. 2 Collector Power Dissipation vs. Ambient Temperature

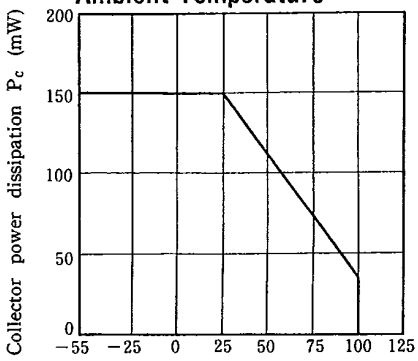


Fig. 3 Forward Current vs. Forward Voltage

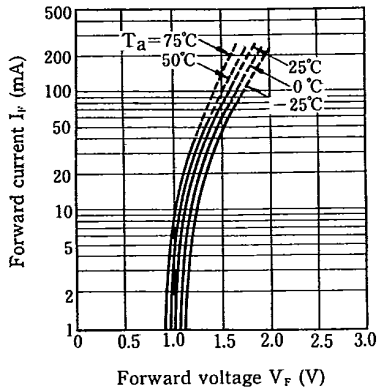


Fig. 4 Current Transfer Ratio vs. Forward Current (PC4N29V, PC4N30V)

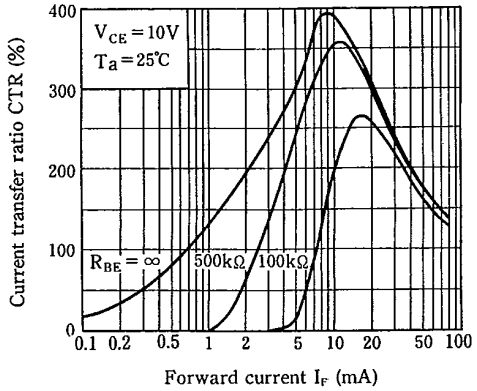


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Fig. 5 Current Transfer Ratio vs. Forward Current (PC4N32V, PC4N33V)

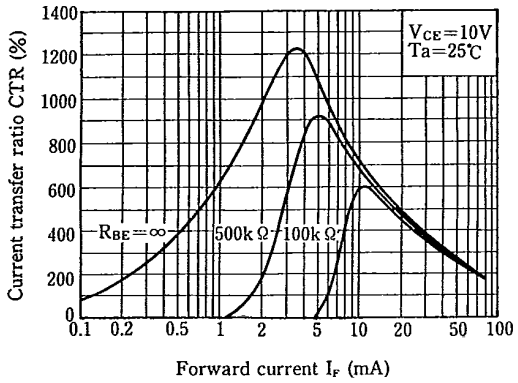


Fig. 6 Collector Current vs. Collector-emitter Voltage (PC4N29V, PC4N30V)

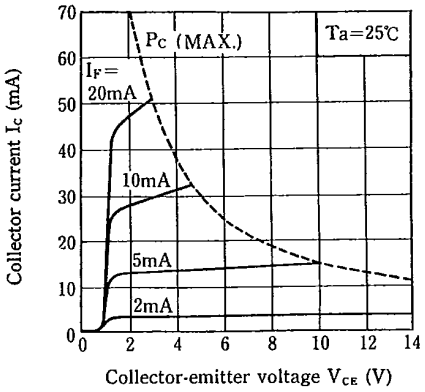


Fig. 7 Collector Current vs. Collector-emitter Voltage (PC4N32V, PC4N33V)

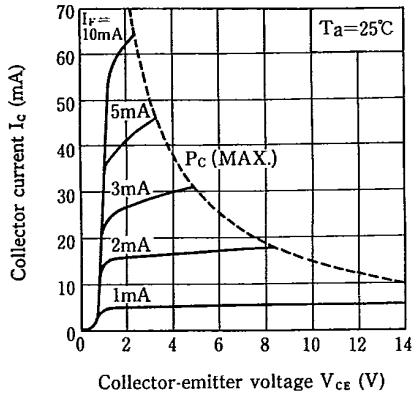


Fig. 8 Relative Current Transfer Ratio vs. Ambient Temperature

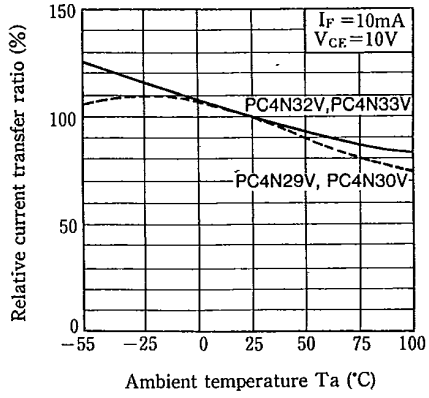


Fig. 9 Collector-emitter Saturation Voltage vs. Ambient Temperature

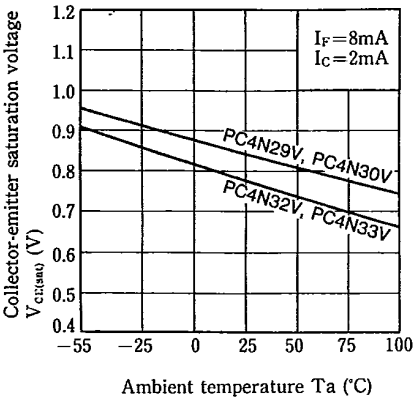


Fig. 10 Collector Dark Current vs. Ambient Temperature

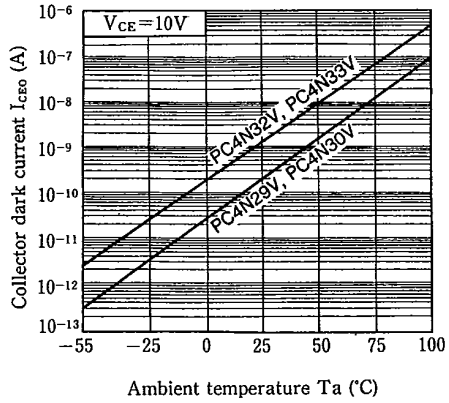


Fig. 11 Frequency Response (PC4N29V, PC4N30V)

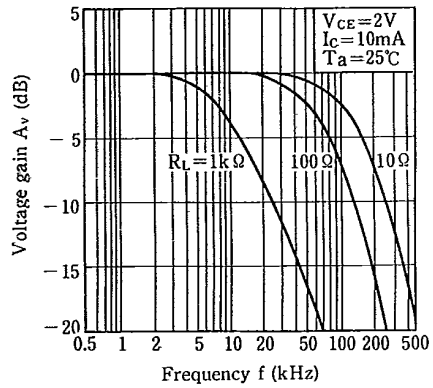


Fig. 12 Frequency Response (PC4N32V, PC4N33V)

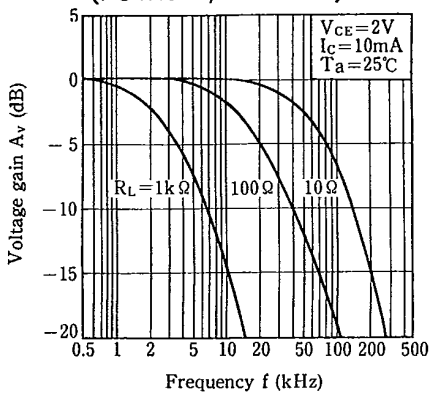


Fig. 13 Collector-emitter Saturation Voltage vs. Forward Current (PC4N29V, PC4N30V)

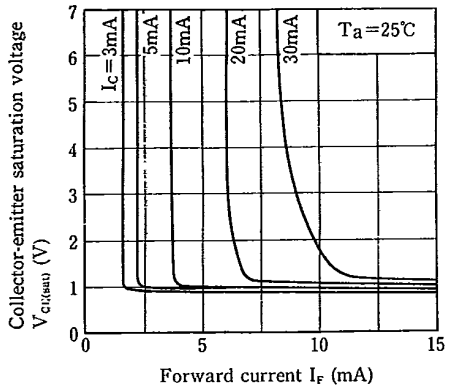
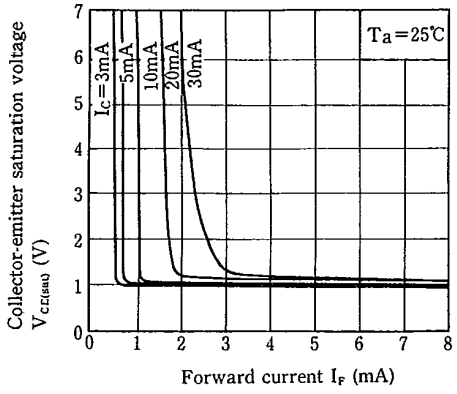


Fig. 14 Collector-emitter Saturation Voltage vs. Forward Current (PC4N32V, PC4N33V)



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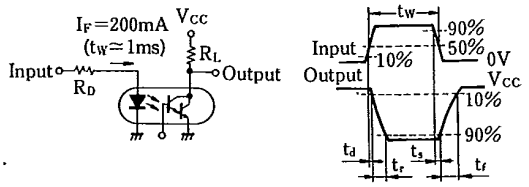
Test Circuit for Response Time



Test Circuit for Frequency Response