

# PC703VxNSZX Series/ PC703VxYSZX Series

## ■ Features

1. TTL compatible output
2. High collector-emitter voltage ( $V_{CE0}$ :70V)
3. Isolation voltage (Viso (rms):5kV)
4. Recognized by UL, file No.E64380  
Approved by TÜV (VDE0884)(PC703VxYSZX Series)
5. 6-pin DIP package

## ■ Applications

1. Home appliances
2. Programmable controllers
3. Peripheral equipment of personal computers

## ■ Model Line-up

Model No.	* Safty Standard Approval		Package
	UL	TÜV(VDE0884)	
PC703VxNSZX Series	○	—	DIP
PC703VxYSZX Series	○	○	

\* Application Model No. PC703V

## ■ 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	$V_{CE0}$	70	V
	Emitter-collector voltage	$V_{ECO}$	6	V
	Collector-base voltage	$V_{CBO}$	70	V
	Emitter-base voltage	$V_{EBO}$	6	V
	Collector current	$I_C$	50	mA
	Collector power dissipation	$P_C$	160	mW
	Total power dissipation	$P_{tot}$	200	mW
*2 Isolation voltage	$V_{iso (rms)}$	5	kV	
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 $\leq$ 100 $\mu$ s, Duty ratio=0.001

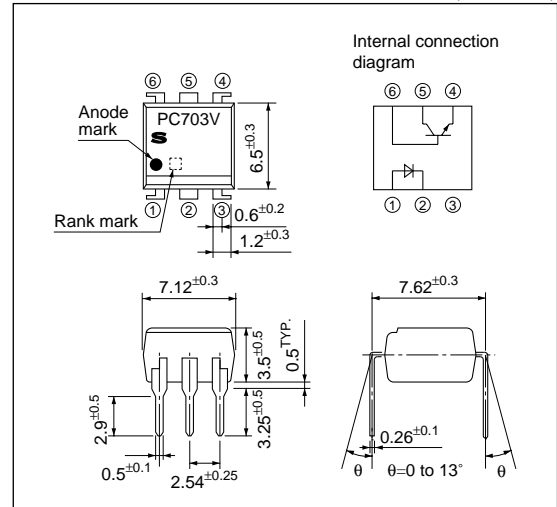
\*2 40 to 60%RH, AC for 1 min

\*3 For 10 s

## High Collector-emitter Voltage Type Photocoupler

## ■ Outline Dimensions

(Unit : mm)



■ Electro-optical Characteristics

(Ta=25°C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit	
Input	Forward voltage	V <sub>F</sub>	I <sub>F</sub> =20mA	-	1.2	1.4	V	
	Peak forward voltage	V <sub>FM</sub>	I <sub>FM</sub> =0.5A	-	-	3.0	V	
	Reverse current	I <sub>R</sub>	V <sub>R</sub> =4V	-	-	10	μA	
	Terminal capacitance	C <sub>t</sub>	V=0, f=1kHz	-	30	250	pF	
Output	Collector dark current	I <sub>CEO</sub>	V <sub>CE</sub> =20V, I <sub>F</sub> =0	-	-	10 <sup>-7</sup>	A	
Transfer characteristics	*4 Collector current		I <sub>C</sub>	I <sub>F</sub> =10mA, V <sub>CE</sub> =5V	4.0	-	32.0	mA
	Collector-emitter saturation voltage		V <sub>CE(sat)</sub>	I <sub>F</sub> =20mA, I <sub>C</sub> =1mA	-	0.1	0.2	V
	Isolation resistance		R <sub>ISO</sub>	DC500V, 40 to 60%RH	5×10 <sup>10</sup>	10 <sup>11</sup>	-	Ω
	Floating capacitance		C <sub>f</sub>	V=0, f=1MHz	-	0.6	1.0	pF
	Cut-off frequency		f <sub>c</sub>	V <sub>CE</sub> =5V, I <sub>C</sub> =2mA, R <sub>L</sub> =100Ω, -3dB	-	80	-	kHz
	Response time	Rise time	t <sub>r</sub>	V <sub>CE</sub> =2V, I <sub>C</sub> =2mA R <sub>L</sub> =100Ω	-	4	15	μs
Fall time		t <sub>f</sub>	-		3	15	μs	

\*4 Classification table of collector current is shown below.

Model No. *5	Rank mark	I <sub>C</sub> (mA)
PC703V1NSZX	A	4.0 to 8.0
PC703V2NSZX	B	6.3 to 12.5
PC703V3NSZX	C	10.0 to 20.0
PC703V4NSZX	D	16.0 to 32.0
PC703V5NSZX	A or B	4.0 to 12.5
PC703V6NSZX	B or C	6.3 to 20.0
PC703V7NSZX	C or D	10.0 to 32.0
PC703V0NSZX	A, B, C or D	4.0 to 32.0

Measuring Conditions

I<sub>F</sub>=10mA  
V<sub>CE</sub>=5V  
T<sub>a</sub>=25°C

\*5 PC703V0YSZX Series are equivalent.

Fig.1 Forward Current vs. Ambient Temperature

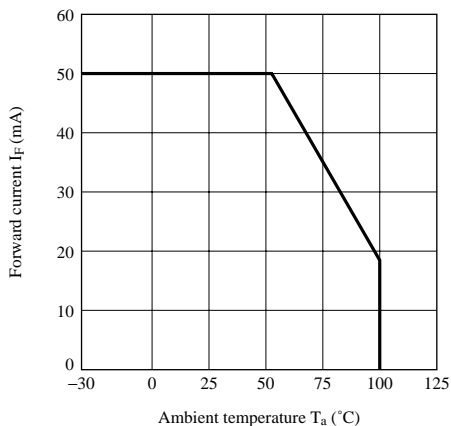


Fig.2 Collector Power Dissipation vs. Ambient Temperature

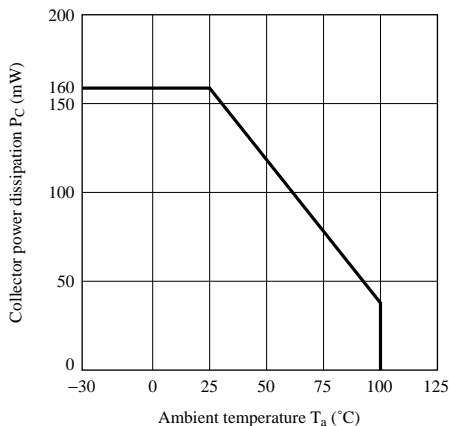


Fig.3 Peak Forward Current vs. Duty Ratio

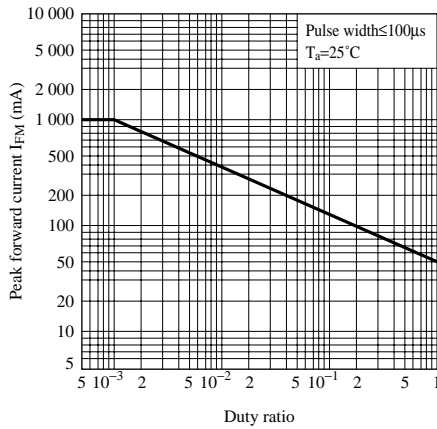


Fig.4 Forward Current vs. Forward Voltage

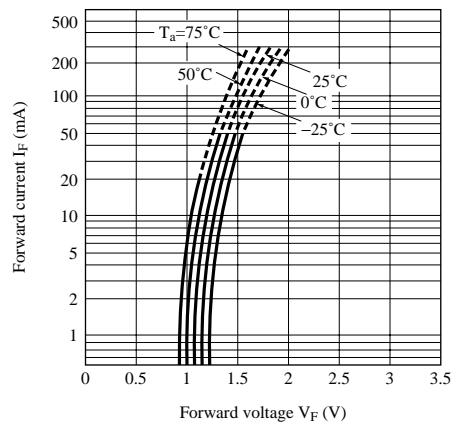


Fig.5 Current Transfer Ratio vs. Forward Current

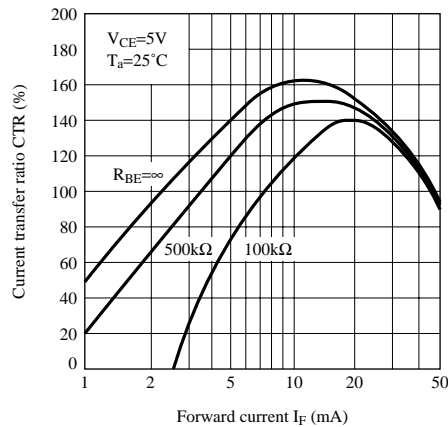


Fig.6 Collector Current vs. Collector-emitter Voltage

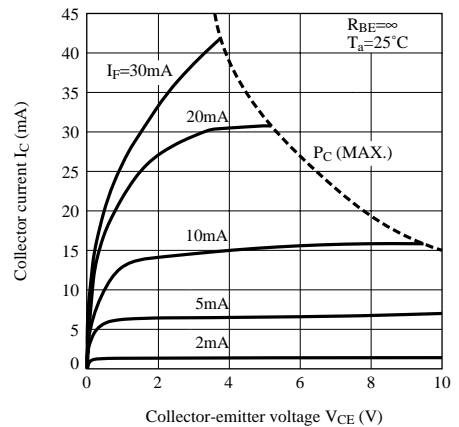


Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

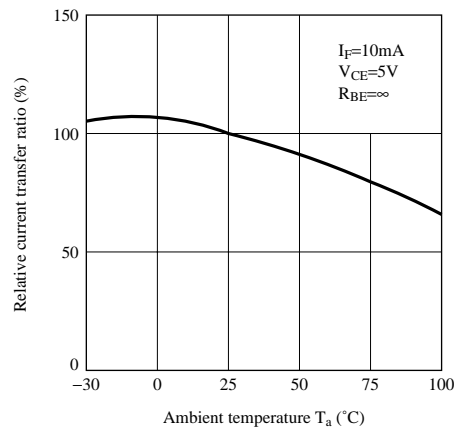
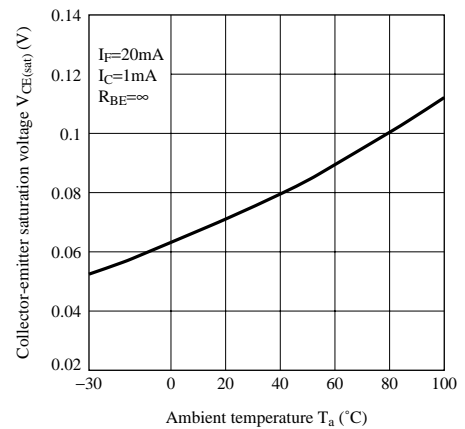
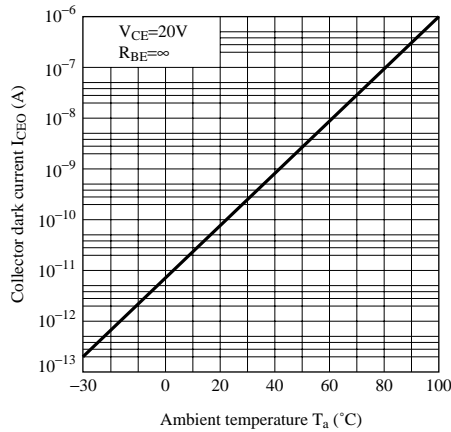


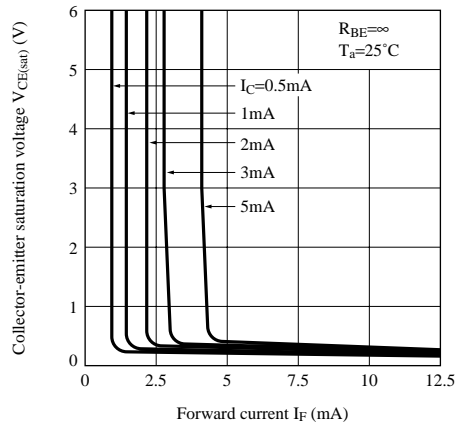
Fig.8 Collector - emitter Saturation Voltage vs. Ambient Temperature



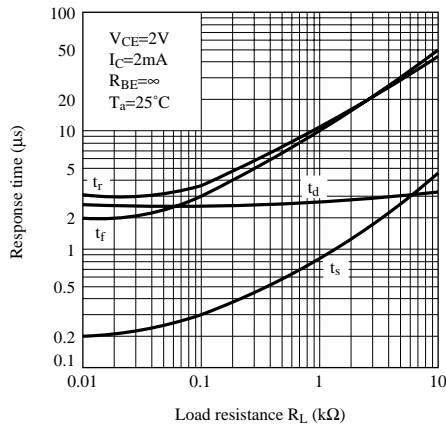
**Fig.9 Collector Dark Current vs. Ambient Temperature**



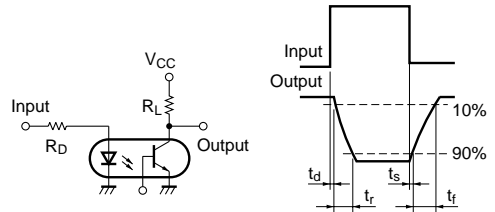
**Fig.10 Collector-emitter Saturation Voltage vs. Forward Current**



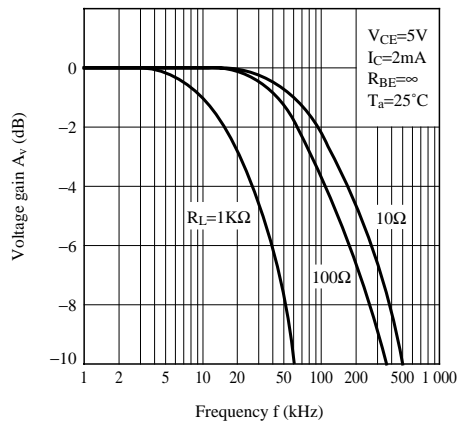
**Fig.11 Response Time vs. Load Resistance**



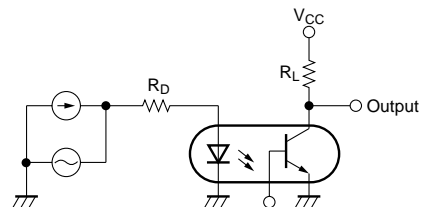
**Fig.12 Test Circuit for Response Time**



**Fig.13 Frequency Response**



**Fig.14 Test Circuit for Frequency Response**



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    - 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:
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    - Telecommunication equipment [trunk lines]
    - Nuclear power control equipment
    - Medical and other life support equipment (e.g., scuba).
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# PC703VxNIZX Series

## ■ Features

1. TTL compatible output
2. High collector-emitter voltage ( $V_{CEO}$ :70V)
3. Isolation voltage (Viso (rms):5kV)
4. Recognized by UL, file No.E64380
5. 6-pin DIP package (Lead forming type)

## ■ Applications

1. Home appliances
2. Programmable controllers
3. Peripheral equipment of personal computers

## ■ 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	$V_{CEO}$	70	V
	Emitter-collector voltage	$V_{ECO}$	6	V
	Collector-base voltage	$V_{CBO}$	70	V
	Emitter-base voltage	$V_{EBO}$	6	V
	Collector current	$I_C$	50	mA
	Collector power dissipation	$P_C$	160	mW
	Total power dissipation	$P_{tot}$	200	mW
	*2 Isolation voltage	$V_{iso}$ (rms)	5	kV
	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

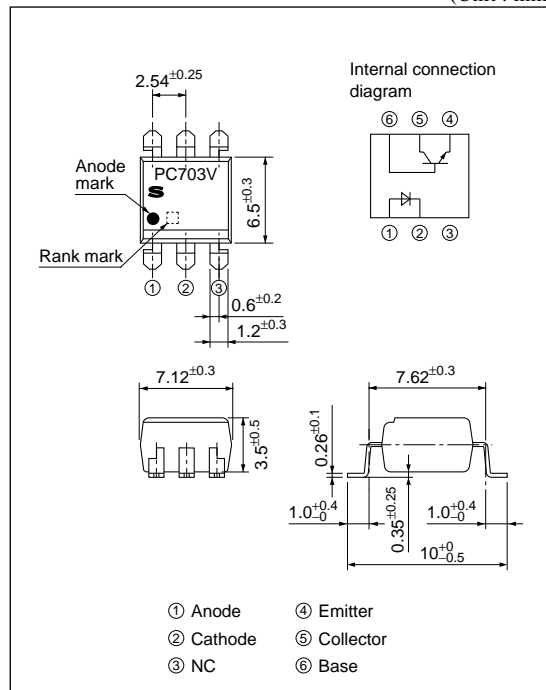
\*2 40 to 60%RH, AC for 1 min

\*3 For 10 s

## High Collector-emitter Voltage Type Photocoupler

## ■ 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
	Peak forward voltage	$V_{FM}$	$I_{FM}=0.5\text{A}$	-	-	3.0	V
	Reverse current	$I_R$	$V_R=4\text{V}$	-	-	10	$\mu\text{A}$
	Terminal capacitance	$C_t$	$V=0, f=1\text{kHz}$	-	30	250	pF
Output	Collector dark current	$I_{CEO}$	$V_{CE}=20\text{V}, I_F=0$	-	-	$10^{-7}$	A
Transfer characteristics	*4 Collector current	$I_C$	$I_F=10\text{mA}, V_{CE}=5\text{V}$	4.0	-	32.0	mA
	Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_F=20\text{mA}, I_C=1\text{mA}$	-	0.1	0.2	V
	Isolation resistance	$R_{ISO}$	DC500V, 40 to 60%RH	$5 \times 10^{10}$	$10^{11}$	-	$\Omega$
	Floating capacitance	$C_f$	$V=0, f=1\text{MHz}$	-	0.6	1.0	pF
	Cut-off frequency	$f_c$	$V_{CE}=5\text{V}, I_C=2\text{mA}, R_L=100\Omega, -3\text{dB}$	-	80	-	kHz
	Response time	Rise time	$t_r$	$V_{CE}=2\text{V}, I_C=2\text{mA}$ $R_L=100\Omega$	-	4	15
Fall time		$t_f$	-		3	15	$\mu\text{s}$

\*4 Classification table of collector current is shown below.

Model No.	Rank mark	$I_C$ (mA)
PC703V1NIZX	A	4.0 to 8.0
PC703V2NIZX	B	6.3 to 12.5
PC703V3NIZX	C	10.0 to 20.0
PC703V4NIZX	D	16.0 to 32.0
PC703V5NIZX	A or B	4.0 to 12.5
PC703V6NIZX	B or C	6.3 to 20.0
PC703V7NIZX	C or D	10.0 to 32.0
PC703V0NIZX	A, B, C or D	4.0 to 32.0

Measuring Conditions

$I_F=10\text{mA}$   
 $V_{CE}=5\text{V}$   
 $T_a=25^\circ\text{C}$

Fig.1 Forward Current vs. Ambient Temperature

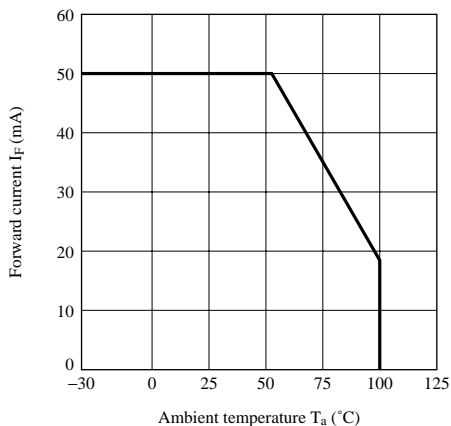


Fig.2 Collector Power Dissipation vs. Ambient Temperature

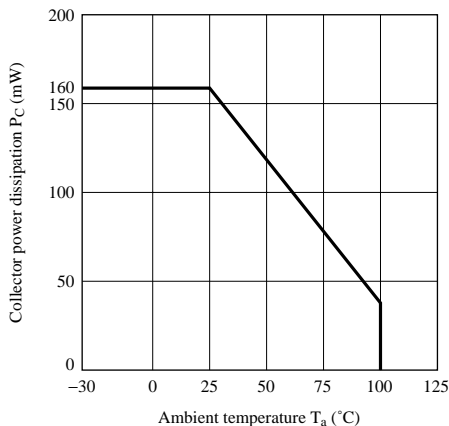


Fig.3 Peak Forward Current vs. Duty Ratio

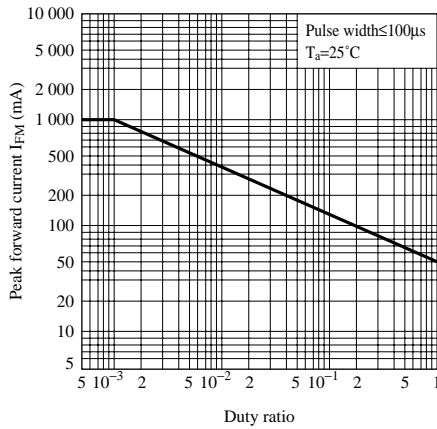


Fig.4 Forward Current vs. Forward Voltage

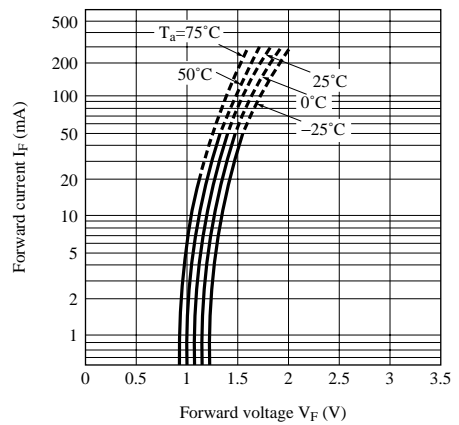


Fig.5 Current Transfer Ratio vs. Forward Current

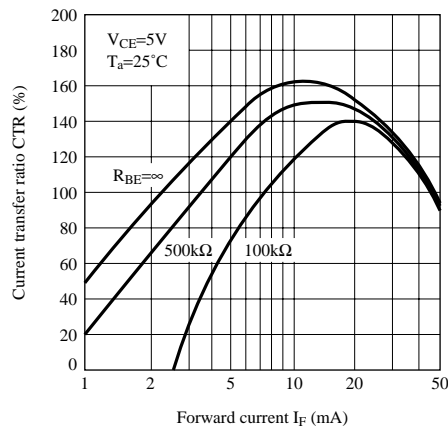


Fig.6 Collector Current vs. Collector-emitter Voltage

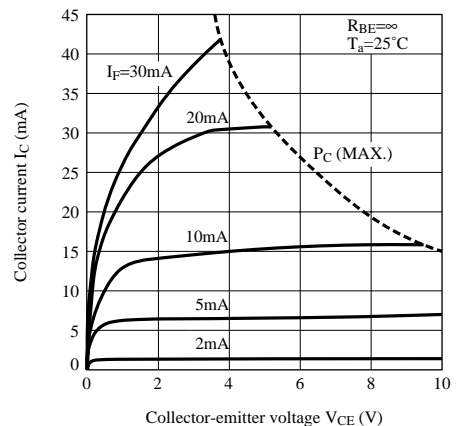


Fig.7 Relative Current Transfer Ratio vs. Ambient Temperature

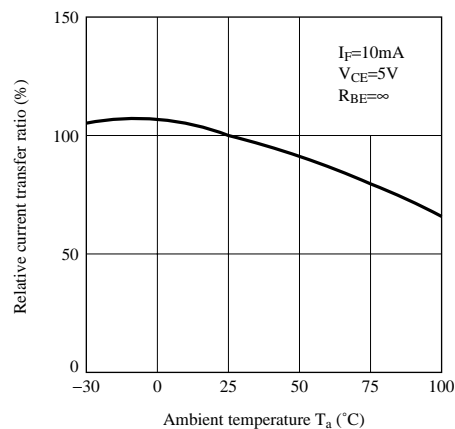
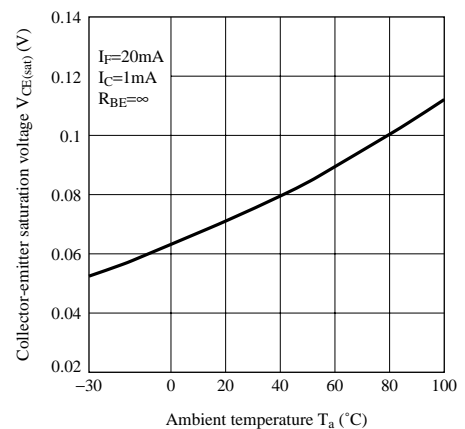
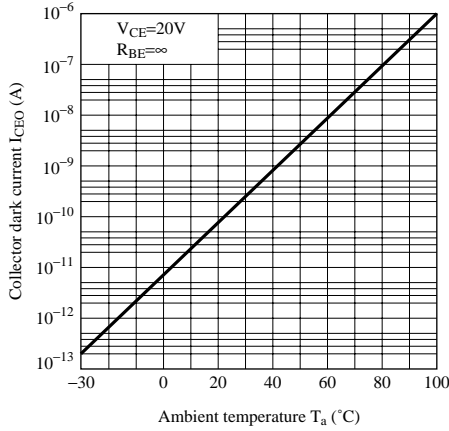


Fig.8 Collector - emitter Saturation Voltage vs. Ambient Temperature

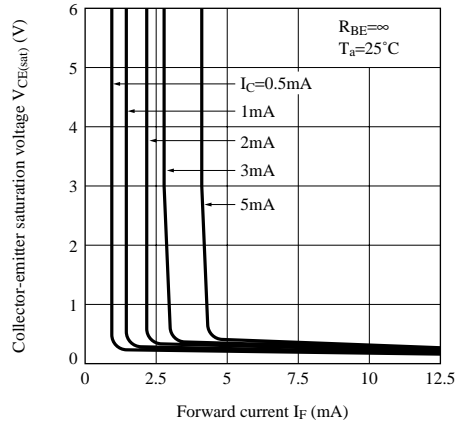




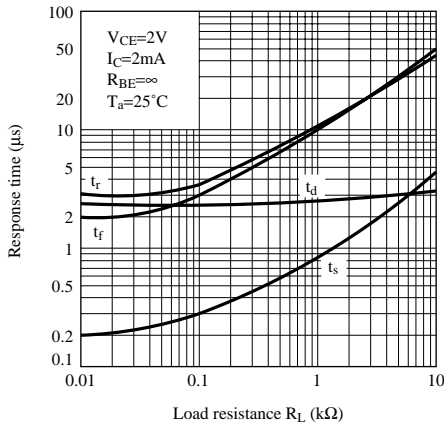
**Fig.9 Collector Dark Current vs. Ambient Temperature**



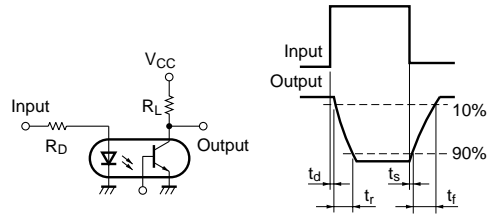
**Fig.10 Collector-emitter Saturation Voltage vs. Forward Current**



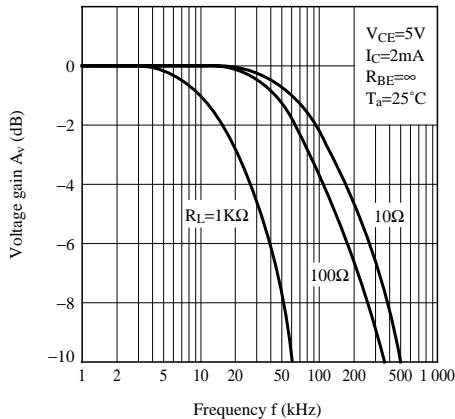
**Fig.11 Response Time vs. Load Resistance**



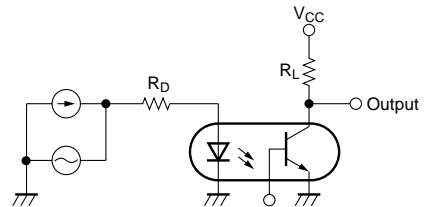
**Fig.12 Test Circuit for Response Time**



**Fig.13 Frequency Response**



**Fig.14 Test Circuit for Frequency Response**



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