

### ●Applications

- Optical control equipment
- HV
- Cameras

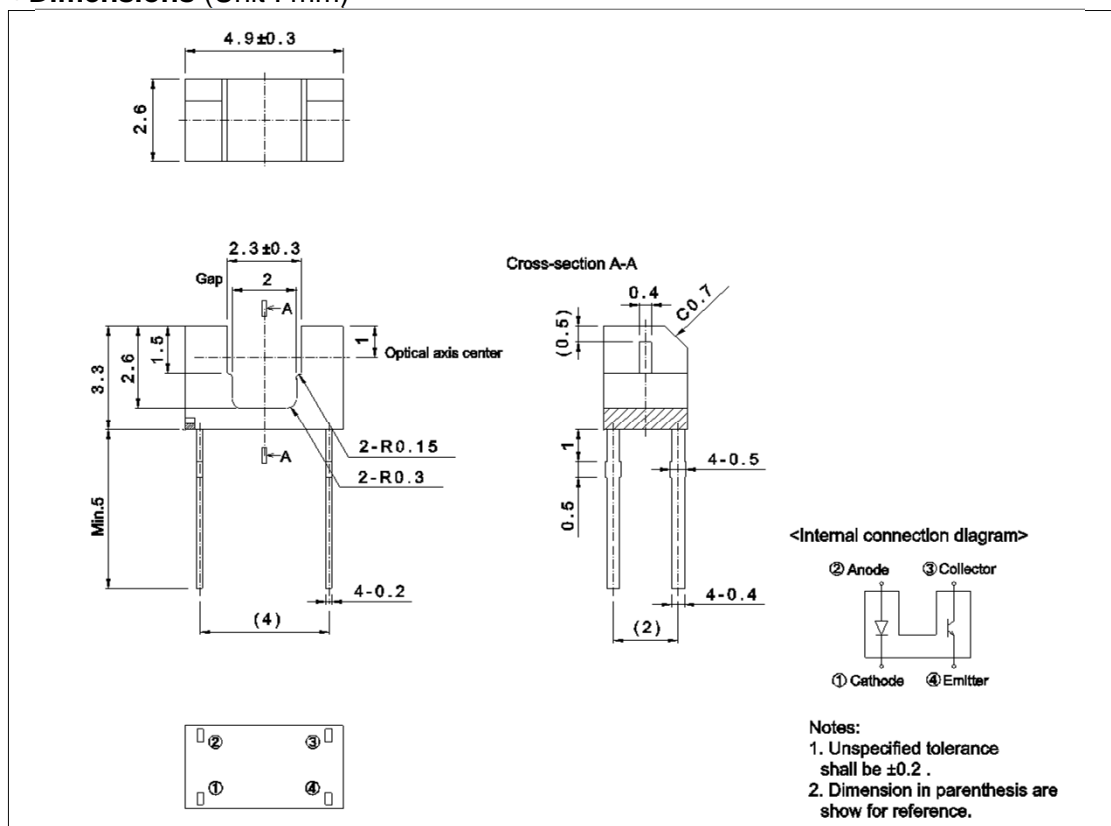
### ●Features

- 1) Ultra-small.
- 2) Minimal influence from stray light.
- 3) Low collector-emitter saturation voltage.

### ●Outline



### ●Dimensions (Unit : mm)



### ●Absolute maximum ratings ( $T_a = 25^\circ\text{C}$ )

Parameter		Symbol	Value	Unit
Input (LED)	Forward current	$I_F$	50	mA
	Reverse voltage	$V_R$	5	V
	Power dissipation	$P_D$	80	mW
Output (photo-transistor)	Collector-emitter voltage	$V_{CEO}$	30	V
	Emitter-collector voltage	$V_{ECO}$	4.5	V
	Collector current	$I_C$	30	mA
	Collector power dissipation	$P_C$	80	mW
Operating temperature		$T_{opr}$	-25 to +85	$^\circ\text{C}$
Storage temperature		$T_{stg}$	-30 to +85	$^\circ\text{C}$

**●Electrical and optical characteristics (T<sub>a</sub> = 25°C)**

Parameter		Symbol	Conditions	Values			Unit
				Min.	Typ.	Max.	
Input characteristics	Forward voltage	V <sub>F</sub>	I <sub>F</sub> =50mA	-	1.3	1.6	V
	Reverse current	I <sub>R</sub>	V <sub>R</sub> =5V	-	-	10	μA
Output characteristics	Dark current	I <sub>CEO</sub>	V <sub>CE</sub> =10V	-	-	0.5	μA
	Peak sensitivity wavelength	λ <sub>p</sub>	-	-	800	-	nm
Transfer characteristics	Collector current	I <sub>C</sub>	V <sub>CE</sub> =5V, I <sub>F</sub> =20mA	0.2	1	-	mA
	Collector-emitter saturation voltage	V <sub>CE(sat)</sub>	I <sub>F</sub> =20mA, I <sub>C</sub> =0.1mA	-	-	0.4	V
	Response time	tr·tf	V <sub>CC</sub> =5V, I <sub>F</sub> =20mA, R <sub>L</sub> =100Ω	-	10	-	μs
Infrared light emitter diode	Cut-off frequency	f <sub>C</sub>	I <sub>F</sub> =50mA	-	1	-	MHz
	Peak light emitting wavelength	λ <sub>p</sub>	* Non-coherent Infrared light emitting diode used.	-	950	-	nm
Photo transistor	Response time	tr·tf	V <sub>CC</sub> =5V, I <sub>C</sub> =1mA, R <sub>L</sub> =100Ω *This product is not designed to be protected against electromagnetic wave.	-	10	-	μs
	Maximum sensitivity wavelength	λ <sub>p</sub>	-	-	800	-	nm

**●Classified table of rank**

Item	Collector current : Ic I	Collector current : Ic II	Unit
A	0.8 to 4.0	0.20 to 1.0	mA
B	0.2 to	-	mA

 ◎ Condition Ic I : Vce=5V, I<sub>F</sub>=20mA / Ic II : Vce=5V, I<sub>F</sub>=5mA

●Electrical and optical characteristics curves

Fig.1 Relative Output Current vs.Distance (I)

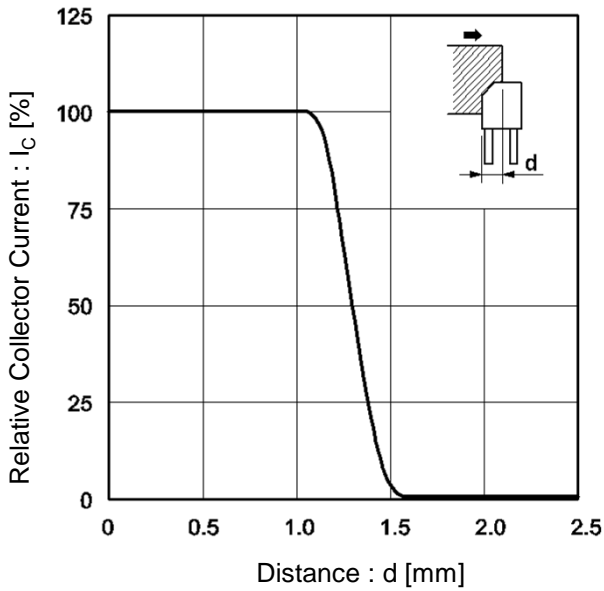


Fig.2 Relative Output Current vs.Distance (II)

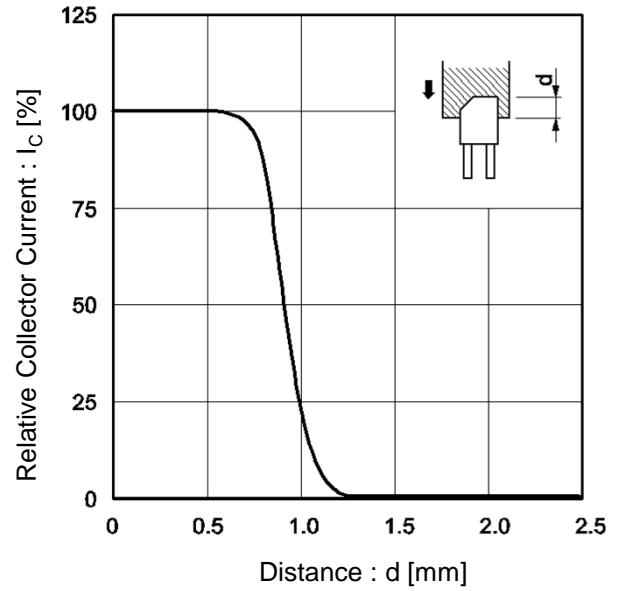


Fig.3 Forward Current Falloff

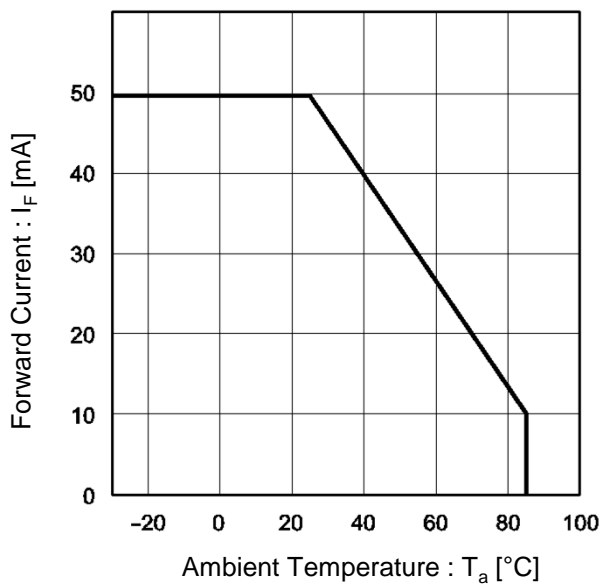
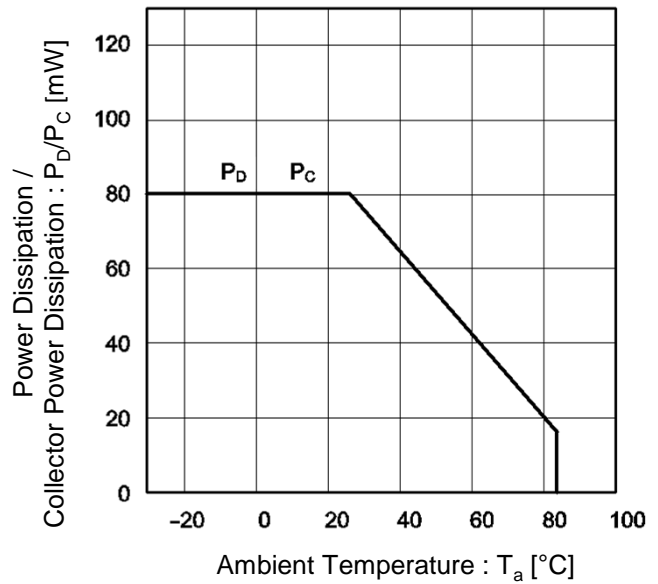


Fig.4 Power Dissipation / Collector Power Dissipation vs. Ambient Temperature



●Electrical and optical characteristics curves

Fig.5 Forward Current vs. Forward Voltage

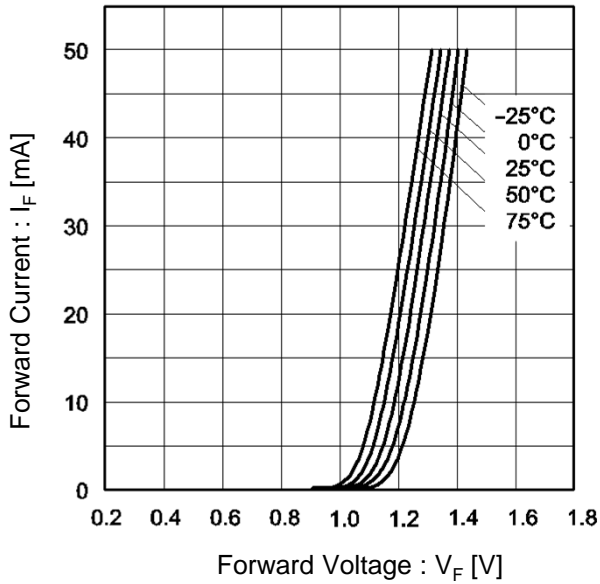


Fig.6 Collector Current vs. Forward Current

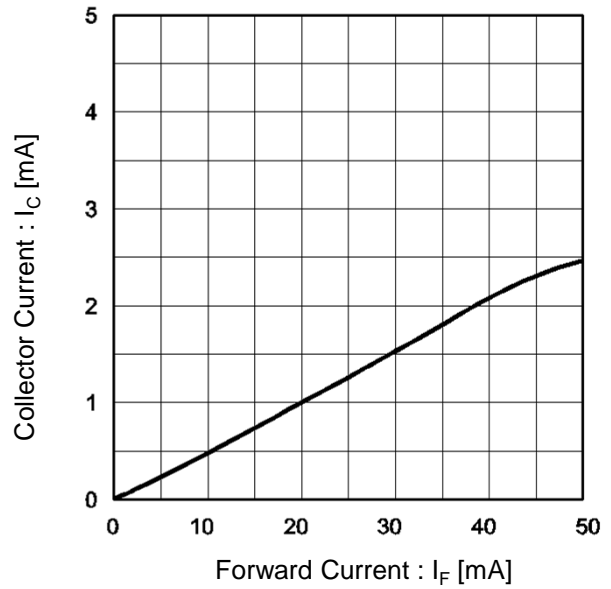


Fig.7 Relative Output vs. Ambient Temperature

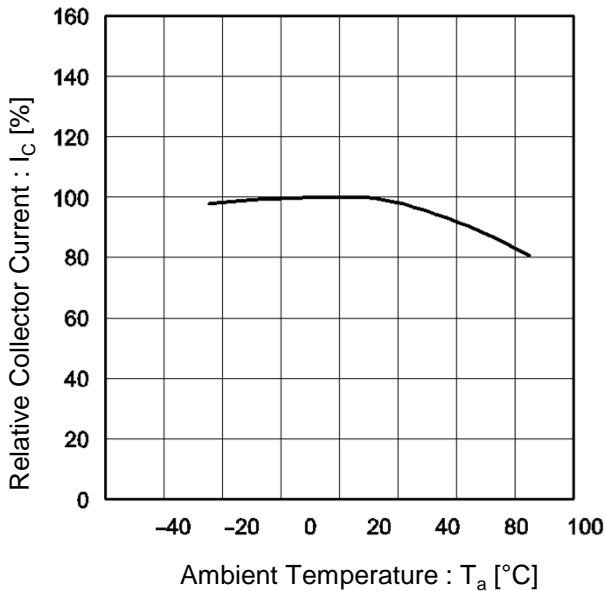
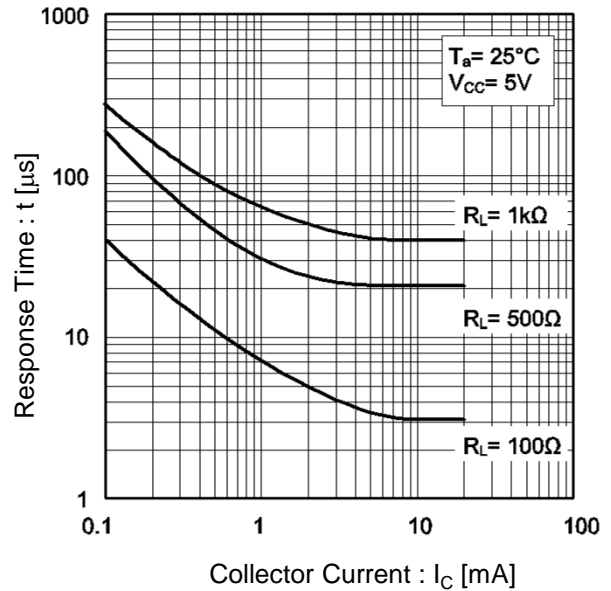


Fig.8 Response Time vs. Collector Current



●Electrical and optical characteristics curves

Fig.9 Dark Current vs. Ambient Temperature

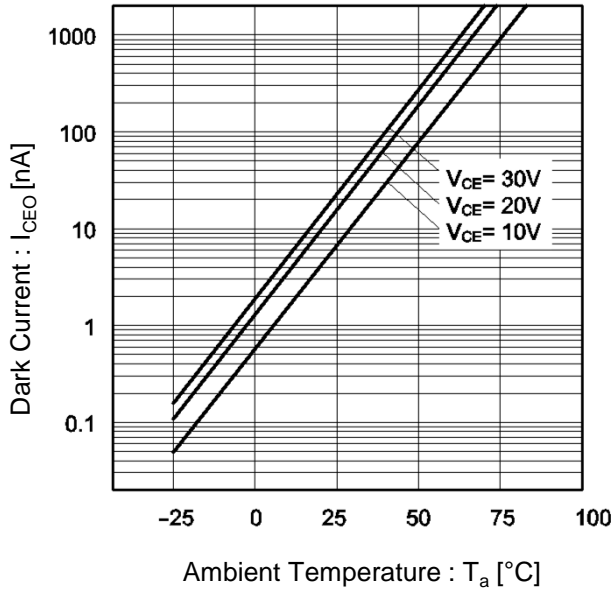


Fig.10 Output Characteristics

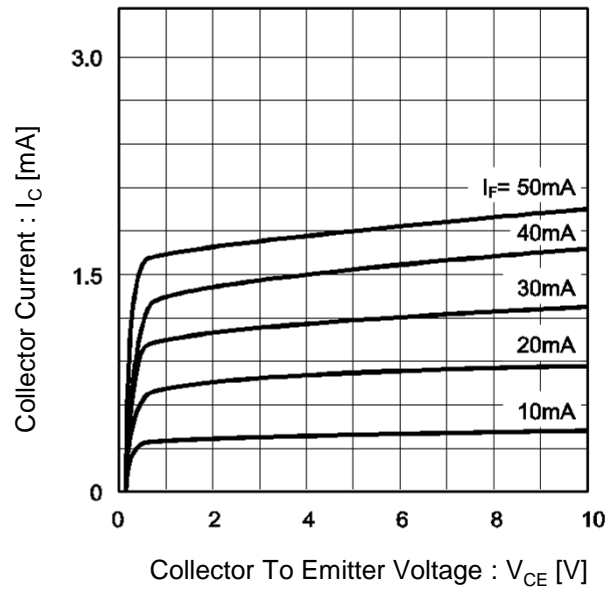
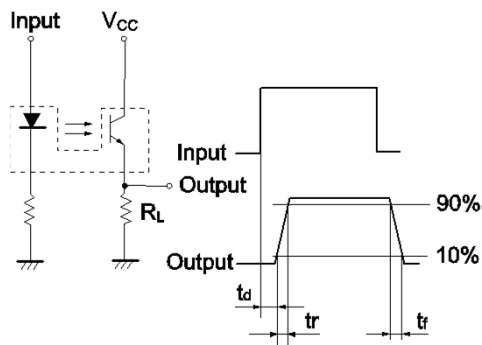


Fig.11 Response Time Measurement Circuit



$t_d$  : Delay time  
 $t_r$  : Rise time (time for output current to rise from 10% to 90% of peak current)  
 $t_f$  : Fall time (time for output current to fall from 90% to 10% of peak current)

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