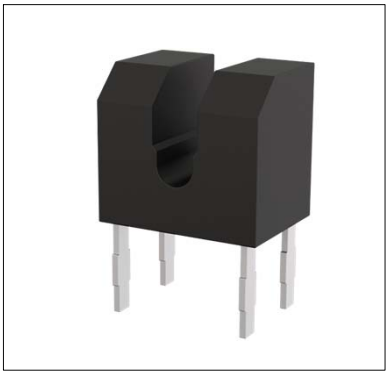
Photointerrupter, Ultraminiature type

RPI-121 Datasheet

●Applications

- Optical control equipment
- Cameras

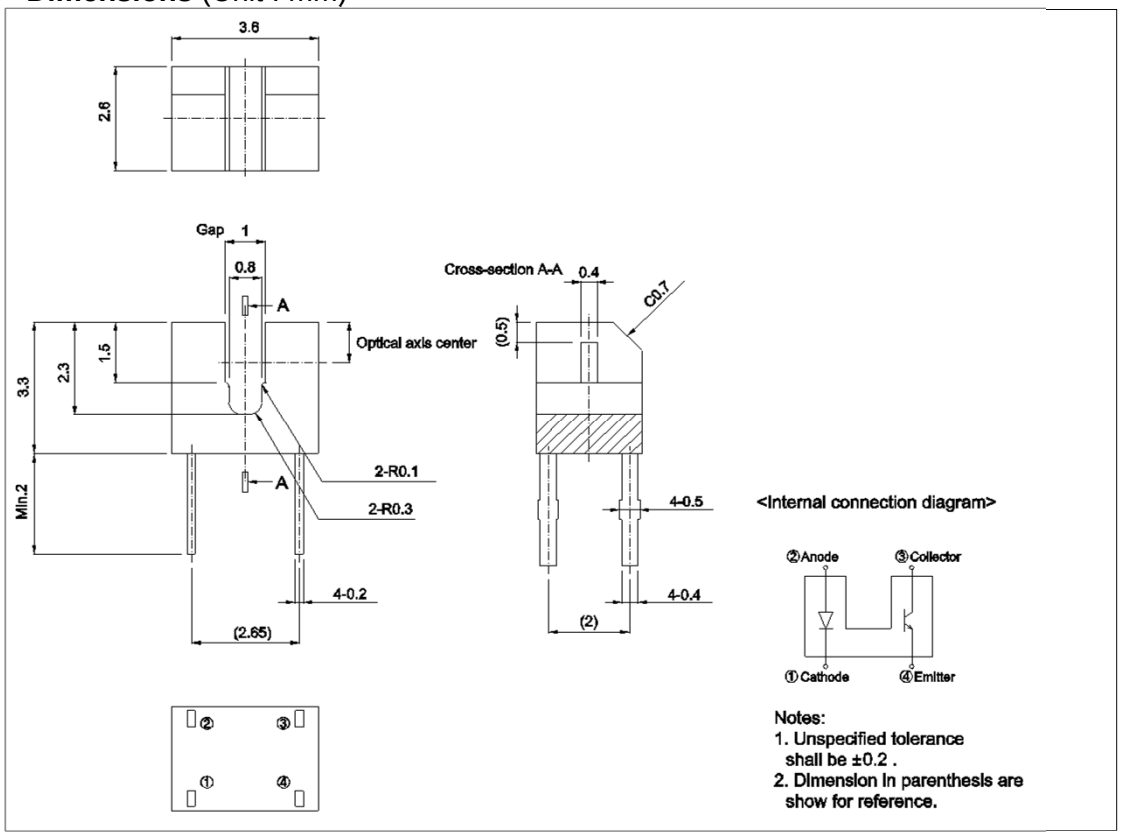
●Outline



●Features

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

●Dimensions (Unit : mm)



●Absolute maximum ratings (T_a = 25°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	°C
Storage temperature		T_{stg}	−40 to +100	°C

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●Electrical and optical characteristics (T_a = 25°C)

Parameter		Symbol	Conditions	Values			Unit
				Min.	Typ.	Max.	
Input characteristics	Forward voltage	V_F	I_F =50mA	-	1.3	1.6	V
	Reverse current	I_R	V_R =5V	-	-	10	μA
Output characteristics	Dark current	I_{CEO}	V_{CE}=10V	-	-	0.5	μA
	Peak sensitivity wavelength	λ_p	-	-	800	-	nm
Transfer characteristics	Collector current	I_{C1}	V_{CE} =5V, I_F=20mA	0.7	-	-	mA
		I_{C2}	V_{CE} =5V, I_F=5mA	0.2	-	-	mA
	Collector-emitter saturation voltage	$V_{CE(sat)}$	I_F =20mA, I_C=0.3mA	-	-	0.3	V
	Response time	tr·tf	V_{CC} =5V, I_F=20mA, R_L=100Ω	-	10	-	μs
Infrare dlight emitter diode	Cut-off frequency	f_C	I_F =50mA * Non-coherent Infrared light emitting diode used.	-	1	-	MHz
	Peak light emitting wavelength	λ_p		-	950	-	nm
Photo transistor	Response time	tr·tf	V_{CC} =5V, I_C=1mA, R_L=100Ω *This product is not designed to be protected against electromagnetic wave.	-	10	-	μs
	Maximum sensitivity wavelength	λ_p	-	-	800	-	nm

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●Electrical and optical characteristics curves

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

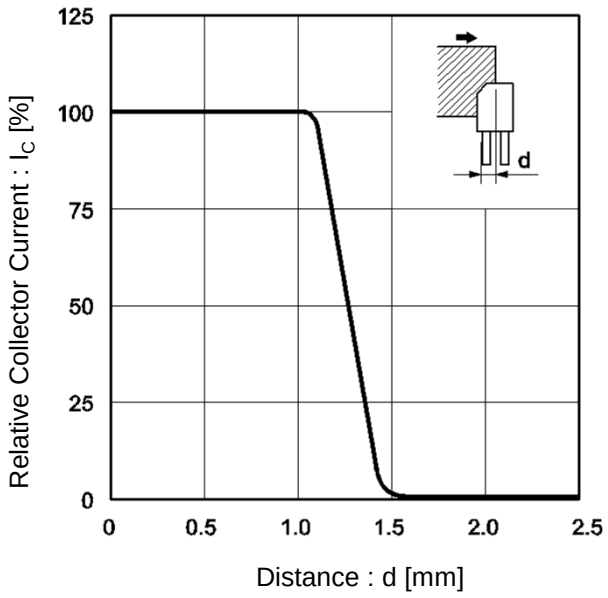


Fig.2 Relative Output Current vs.Distance (II)

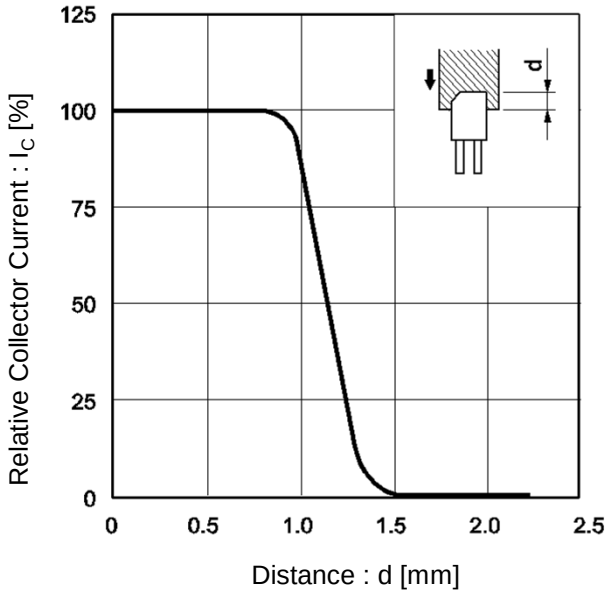


Fig.3 Forward Current Falloff

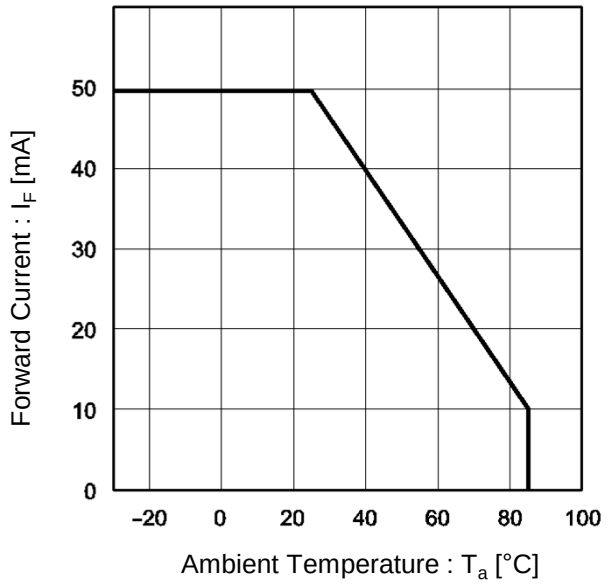
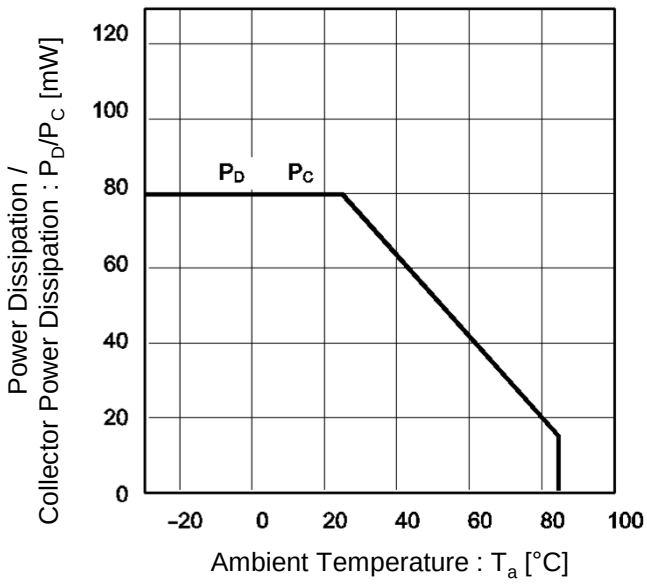


Fig.4 Power Dissipation / Collector Power Dissipation vs. Ambient Temperature



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●Electrical and optical characteristics curves

Fig.5 Forward Current vs. Forward Voltage

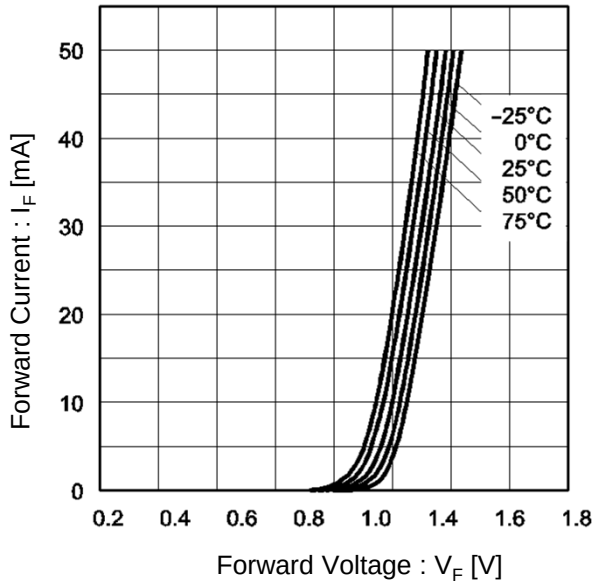


Fig.6 Collector Current vs. Forward Current

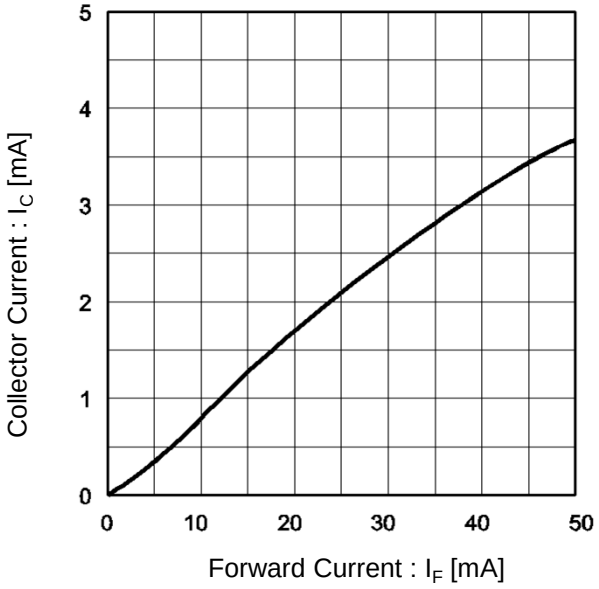


Fig.7 Relative Output vs. Ambient Temperature

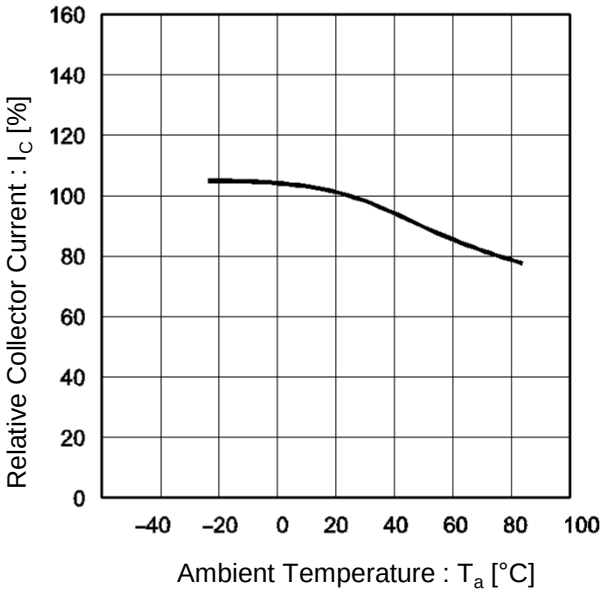
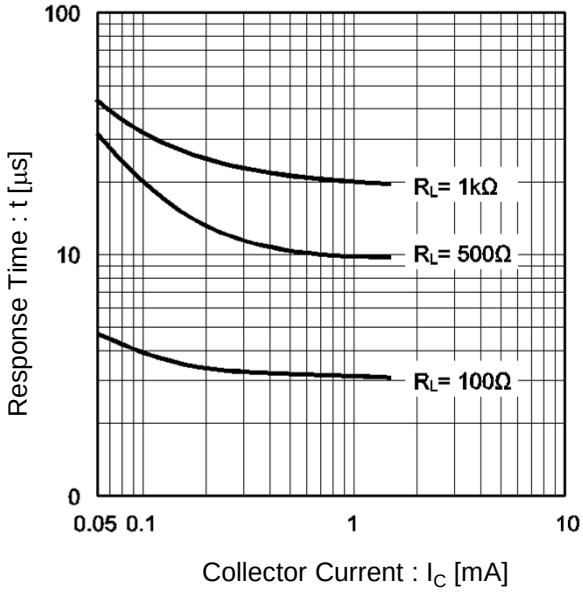


Fig.8 Response Time vs. Collector Current



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●Electrical and optical characteristics curves

Fig.9 Dark Current vs. Ambient Temperature

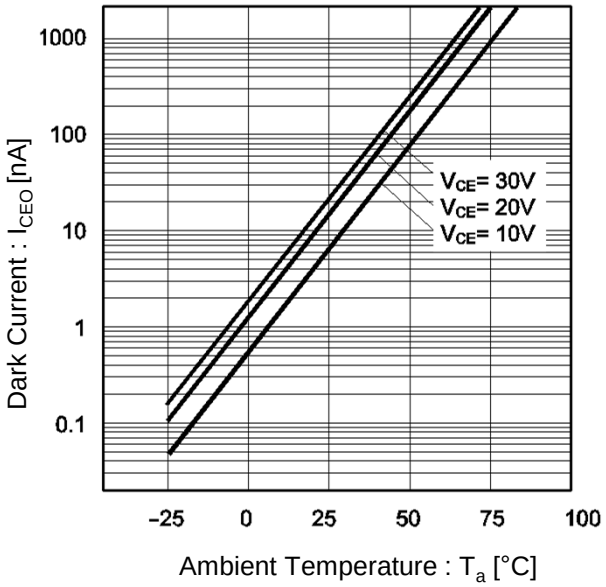


Fig.10 Output Characteristics

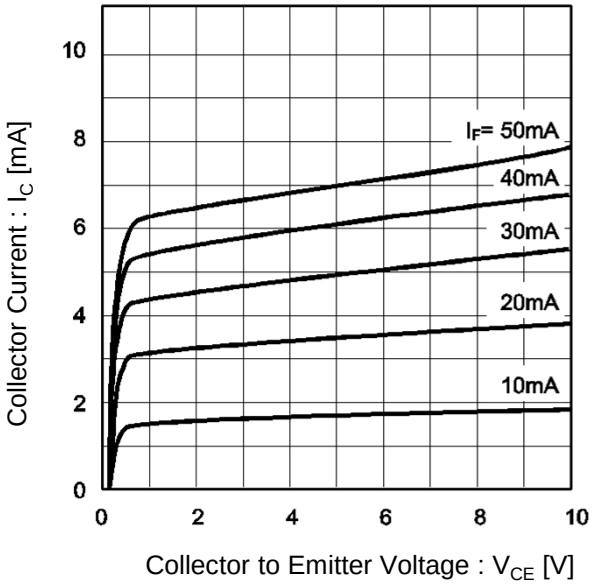
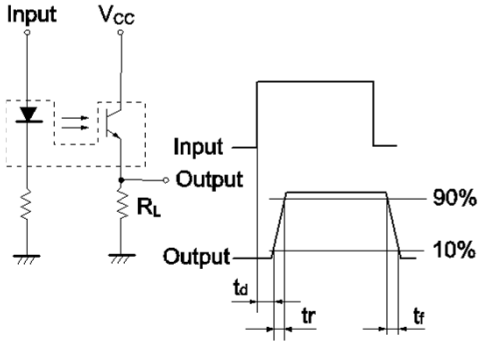


Fig.11 Response Time Measurement Circuit



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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