



THE DATASHEET OF

RPI-441C1

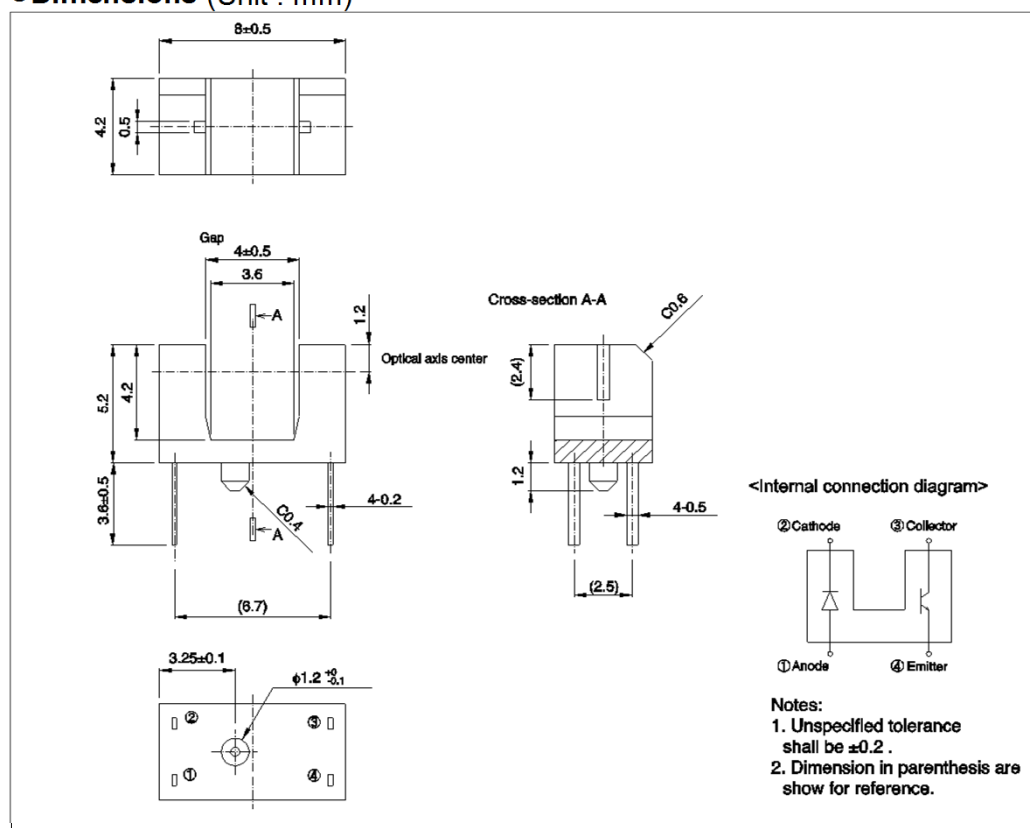
●Applications

- Optical control equipment
- Printers
- Amusement

●Features

- 1) Compact with a 4mm gap.
- 2) High precision position detection (slit width of 0.5mm).
- 3) Minimal influence from stray light.
- 4) Low collector-emitter saturation voltage.

●Dimensions (Unit : mm)



●Outline



●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}	-30 to +85	°C

●Electrical and optical characteristics ($T_a = 25^\circ\text{C}$)

Parameter		Symbol	Conditions	Values			Unit
				Min.	Typ.	Max.	
Input characteristics	Forward voltage	V_F	$I_F = 50\text{mA}$	-	1.3	1.6	V
	Reverse current	I_R	$V_R = 5\text{V}$	-	-	10	μA
Output characteristics	Dark current	I_{CEO}	$V_{CE} = 10\text{V}$	-	-	0.5	μA
	Peak sensitivity wavelength	λ_p	-	-	800	-	nm
Transfer characteristics	Collector current	I_C	$V_{CE} = 5\text{V}$, $I_F = 20\text{mA}$	0.2	0.55	-	mA
	Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_F = 20\text{mA}$, $I_C = 0.1\text{mA}$	-	-	0.4	V
	Response time	$tr \cdot tf$	$V_{CC} = 5\text{V}$, $I_F = 20\text{mA}$, $R_L = 100\Omega$	-	10	-	μs
Infrared light emitter diode	Cut-off frequency	f_C	$I_F = 50\text{mA}$	-	1	-	MHz
	Peak light emitting wavelength	λ_p	* Non-coherent Infrared light emitting diode used.	-	950	-	nm
Photo transistor	Response time	$tr \cdot tf$	$V_{CC} = 5\text{V}$, $I_C = 1\text{mA}$, $R_L = 100\Omega$ *This product is not designed to be protected against electromagnetic wave.	-	10	-	μs
	Maximum sensitivity wavelength	λ_p	-	-	800	-	nm

●Electrical and optical characteristics curves

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

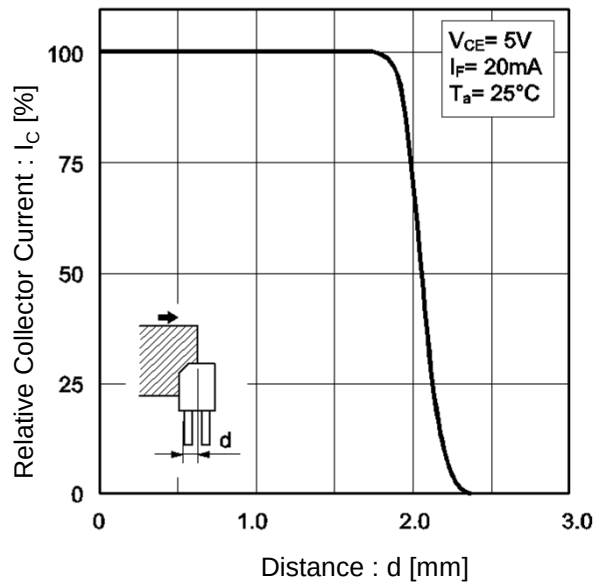


Fig.2 Relative Output Current vs.Distance (II)

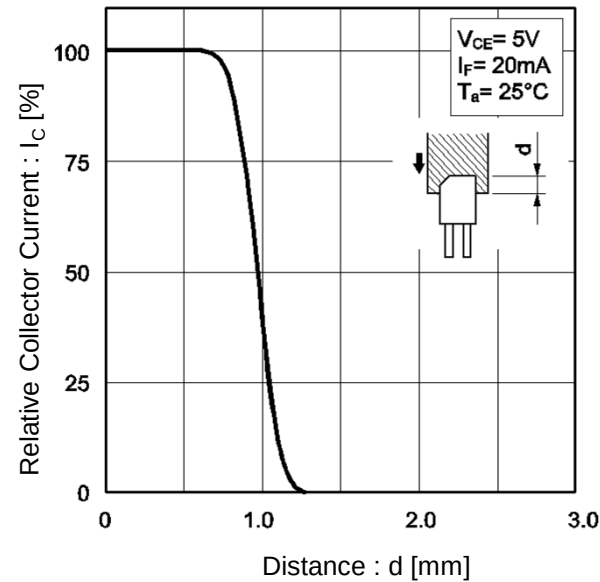


Fig.3 Forward Current Falloff

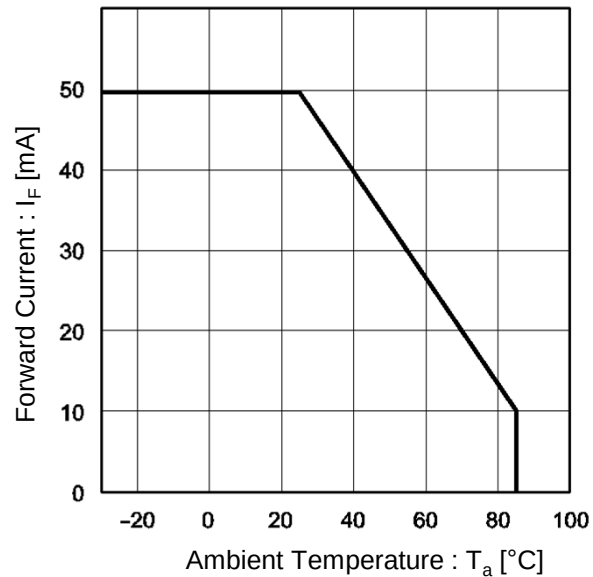
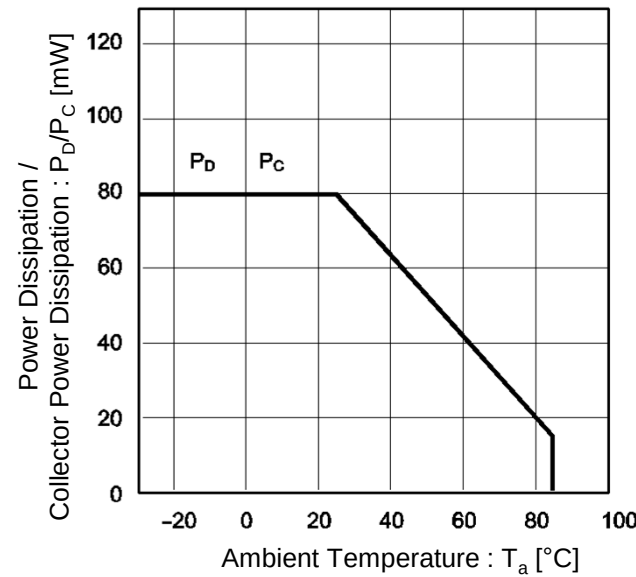


Fig.4 Power Dissipation / Collector Power Dissipation vs. Ambient Temperature



●Electrical and optical characteristics curves

Fig.5 Forward Current vs. Forward Voltage

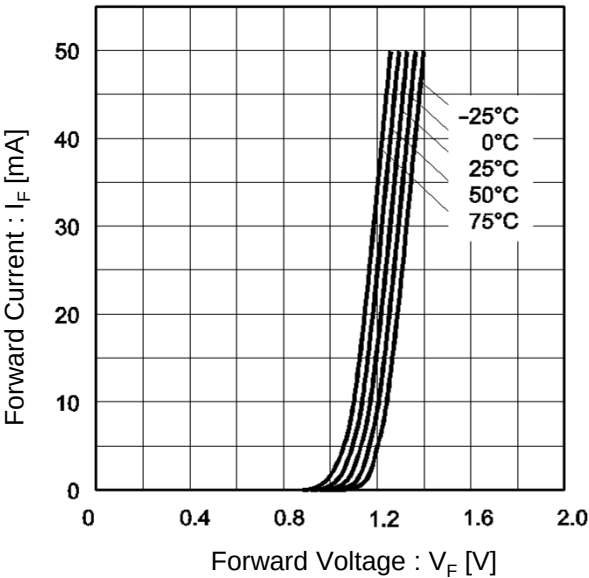


Fig.6 Collector Current vs. Forward Current

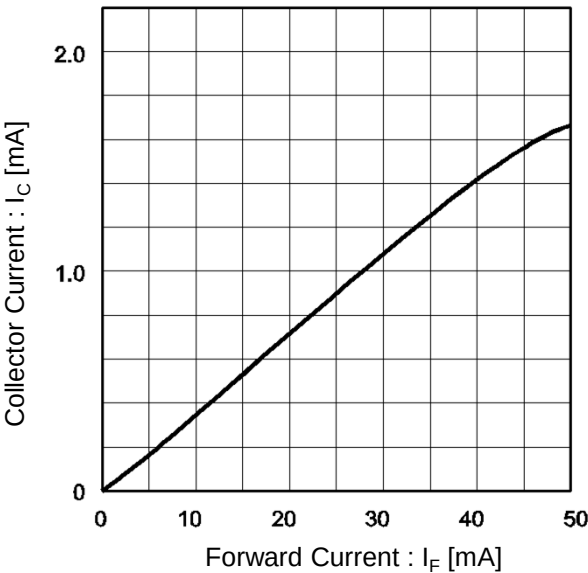


Fig.7 Relative Output vs. Ambient Temperature

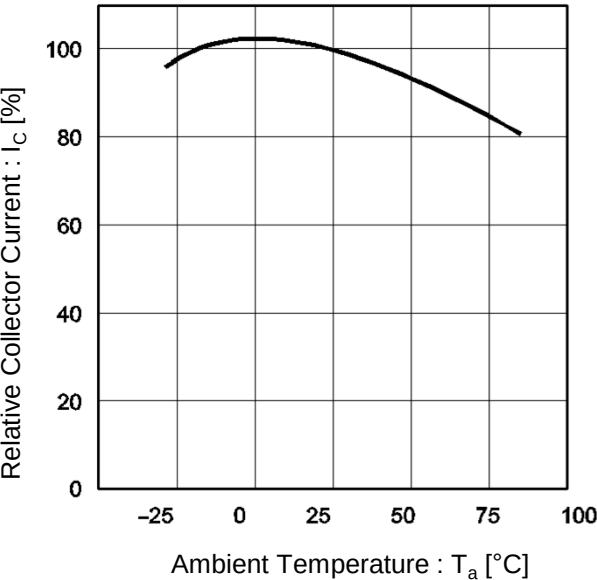
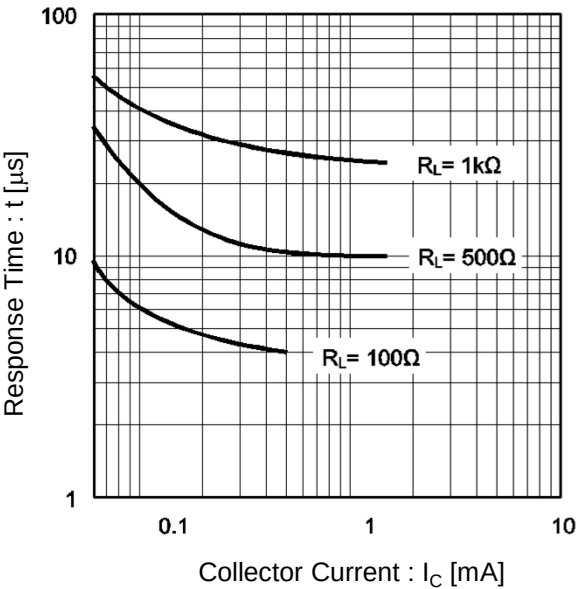


Fig.8 Response Time vs. Collector Current



●Electrical and optical characteristics curves

Fig.9 Dark Current vs. Ambient Temperature

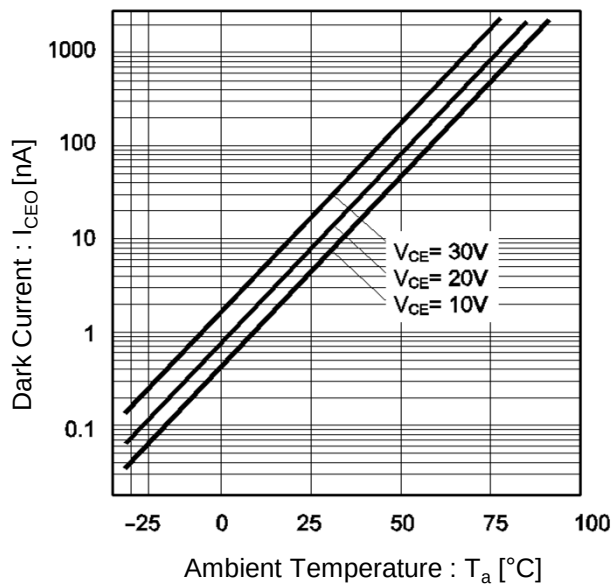


Fig.10 Output Characteristics

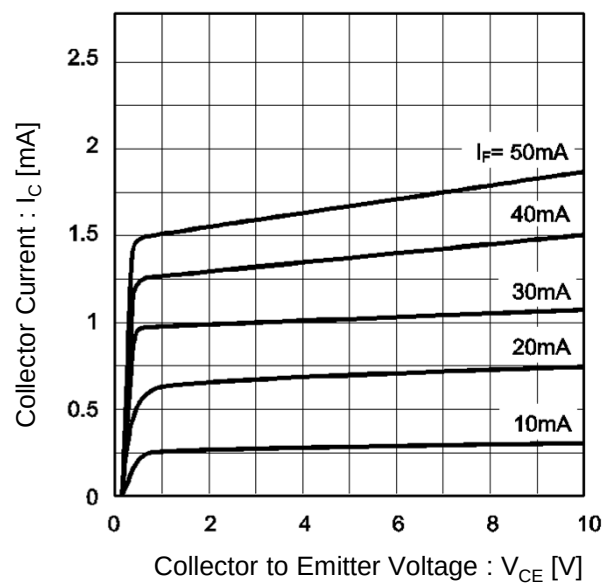
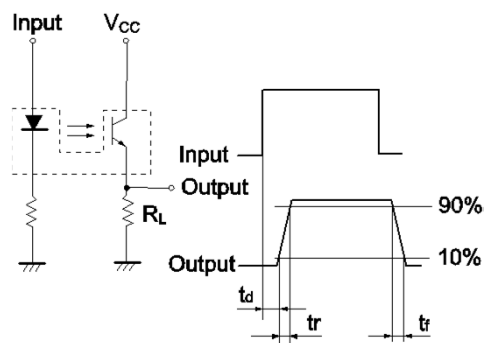


Fig.11 Response Time Measurement Circuit



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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