

# Photointerrupter, double-layer mold type

## RPI-441C1

The RPI-441C1 is a compact, double-layer mold photointerrupter.

While the gap has a width of 4mm, the body has the compact dimensions of 8mm(w) × 5.2mm(h) × 4.2mm(d).

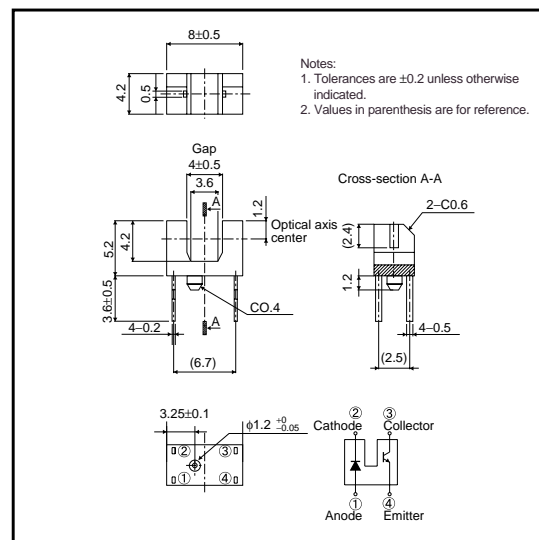
### ●Applications

Optical control equipment  
Facsimiles  
Printers

### ●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 voltage.

### ●External dimensions (Units : mm)



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

Parameter	Symbol	Limits	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	$V_{CE0}$	30	V
	Emitter-collector voltage	$V_{EC0}$	4.5	V
	Collector current	$I_C$	30	mA
	Collector power dissipation	$P_C$	80	mW
Operating temperature	$T_{opr}$	-25~+85	$^\circ\text{C}$	
Storage temperature	$T_{stg}$	-30~+85	$^\circ\text{C}$	

Sensors

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

	Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input characteristics	Forward voltage	$V_F$	-	1.3	1.6	V	$I_F=50\text{mA}$
	Reverse current	$I_R$	-	-	10	$\mu\text{A}$	$V_R=5\text{V}$
Output characteristics	Dark current	$I_{CE0}$	-	-	0.5	$\mu\text{A}$	$V_{CE}=10\text{V}$
	Peak sensitivity wavelength	$\lambda_P$	-	800	-	nm	-
Transfer characteristics	Collector current	$I_C$	0.2	1.0	-	mA	$V_{CE}=5\text{V}, I_F=20\text{mA}$
	Collector-emitter saturation voltage	$V_{CE(sat)}$	-	-	0.4	V	$I_F=20\text{mA}, I_C=0.1\text{mA}$
	Response time	$t_r \cdot t_f$	-	10	-	$\mu\text{s}$	$V_{CC}=5\text{V}, I_F=20\text{mA}, R_L=100\Omega$

●Electrical and optical characteristic curves

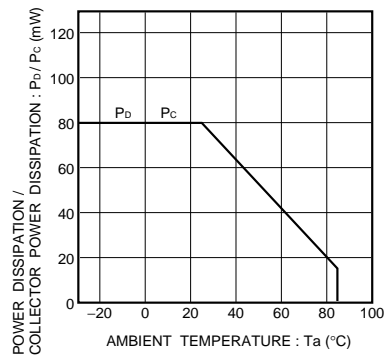


Fig.1 Power dissipation and collector power dissipation vs. ambient temperature

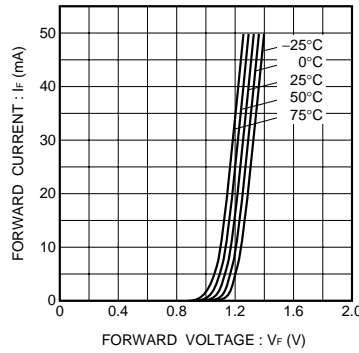


Fig.2 Forward current vs. forward voltage

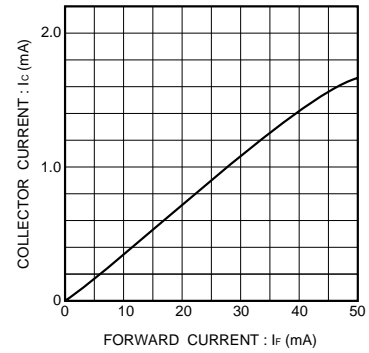


Fig.3 Collector current vs. forward current

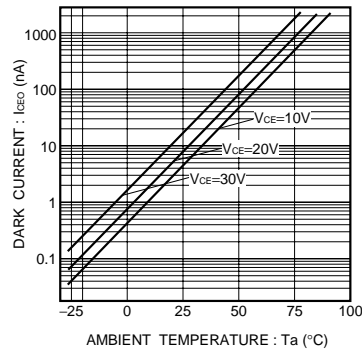


Fig.4 Dark current vs. ambient temperature

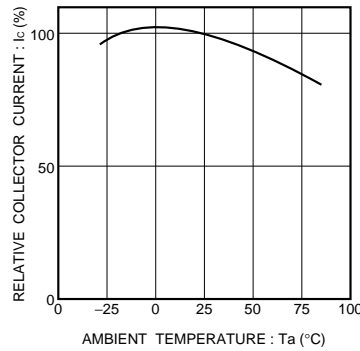


Fig.5 Relative output vs. ambient temperature

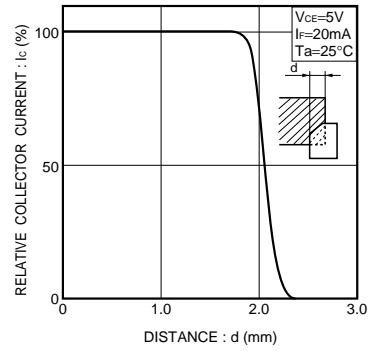


Fig.6 Relative output vs. distance (l)

Sensors

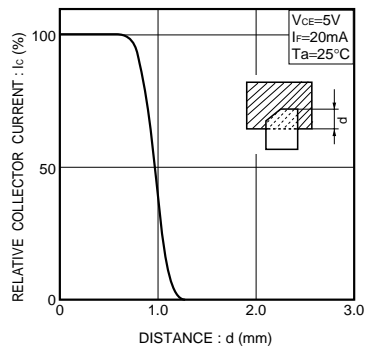


Fig.7 Relative output vs. distance (II)

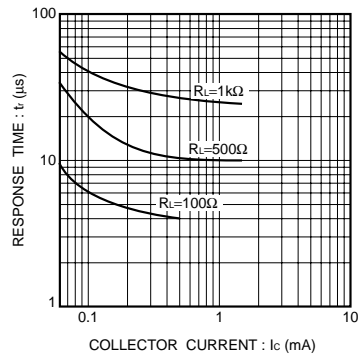


Fig.8 Response time vs. collector current

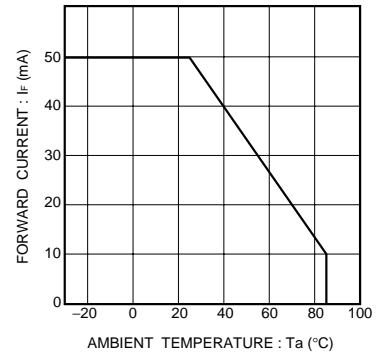


Fig.9 Forward current vs. ambient temperature

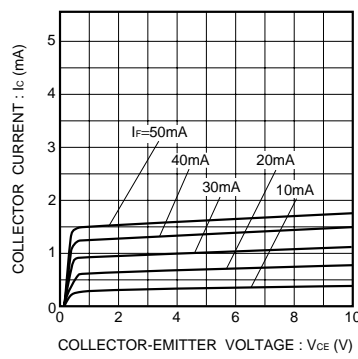
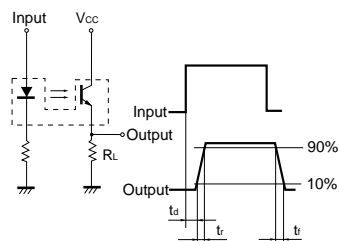


Fig.10 Output characteristics



$t_d$  : 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)

Fig.11 Response time measurement circuit