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Sensors

# Photointerrupter, double-layer mold type

## RPI-131

The RPI-131 is an ultra-small size, double-layer photointerrupter.

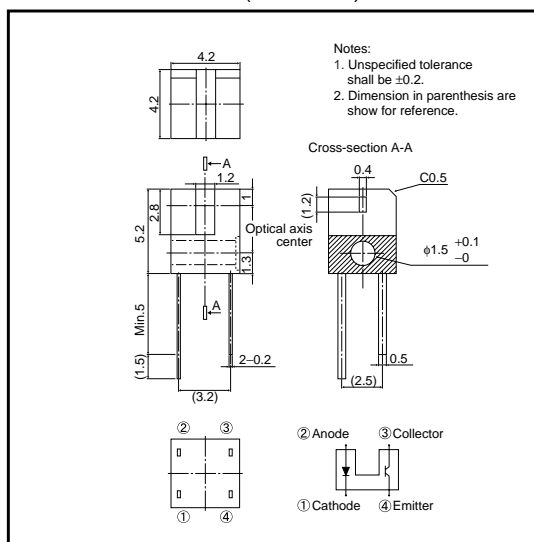
●Applications

- Optical control equipment
- Cameras
- Floppy disk drives

●Features

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

●External dimensions (Units : mm)



●Absolute maximum ratings (Ta = 25°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	$V_{CEO}$	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~+85	°C
Storage temperature		$T_{stg}$	-40~+100	°C

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● **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	$I_{CEO}$	–	–	0.5	$\mu\text{A}$	$V_{CE}=10\text{V}$
	Peak sensitivity wavelength	$\lambda_P$	–	800	–	nm	–
Transfer characteristics	Collector current	$I_{c1}$	0.7	–	–	mA	$V_{CE}=5\text{V}, I_F=20\text{mA}$
		$I_{c2}$	0.2	–	–	mA	$V_{CE}=5\text{V}, I_F=5\text{mA}$
	Collector-emitter saturation voltage	$V_{CE(sat)}$	–	–	0.3	V	$I_F=20\text{mA}, I_c=0.3\text{mA}$
	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**

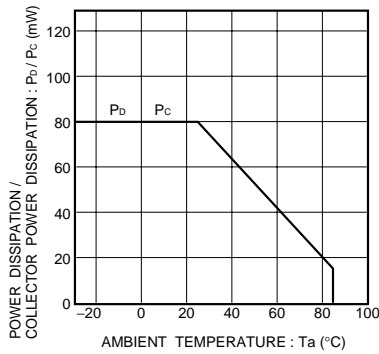


Fig.1 Power dissipation / collector power dissipation vs. ambient temperature

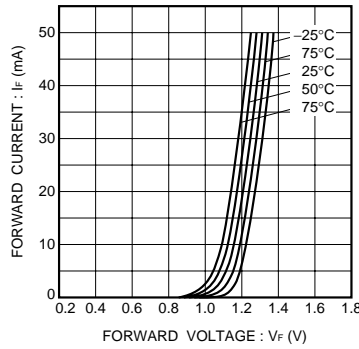


Fig.2 Forward current vs. forward voltage

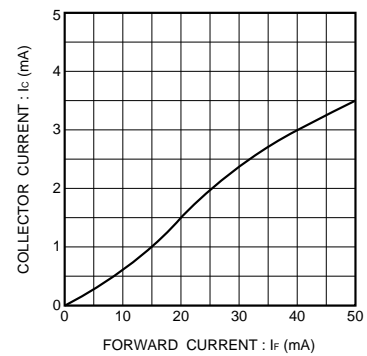


Fig.3 Collector current vs. forward current

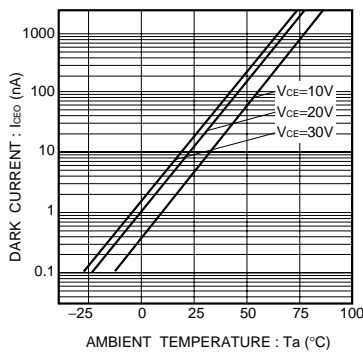


Fig.4 Dark current vs. ambient temperature

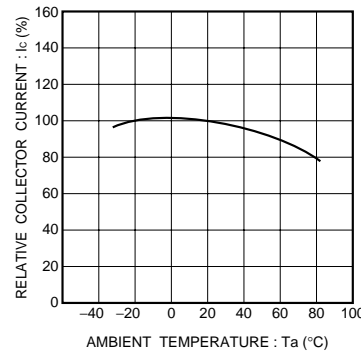


Fig.5 Relative output vs. ambient temperature

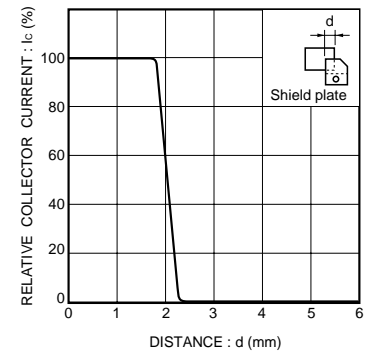


Fig.6 Relative output current vs. distance

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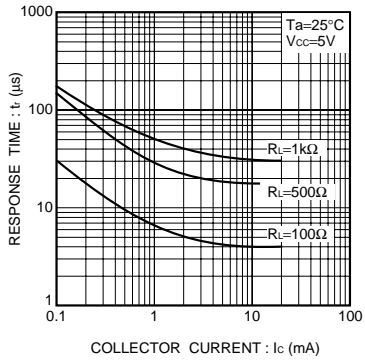


Fig.7 Response time vs. collector current

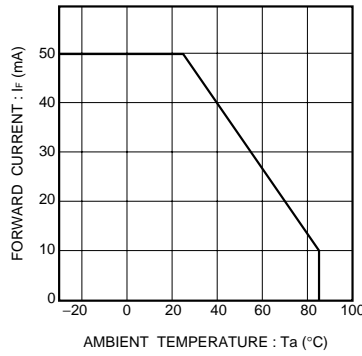


Fig.8 Forward current falloff

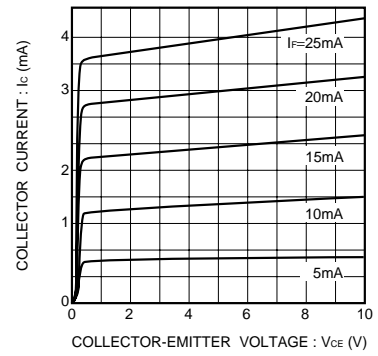
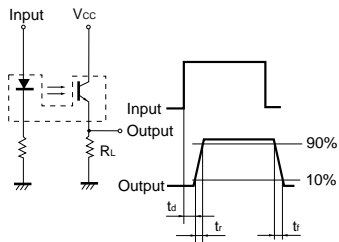


Fig.9 Output characteristics



$t_s$  : 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.10 Response time measurement circuit

## Appendix

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