

# CNB1001, CNB1002

## Reflective photosensors

Non-contact point SW, object sensing

### ■ Overview

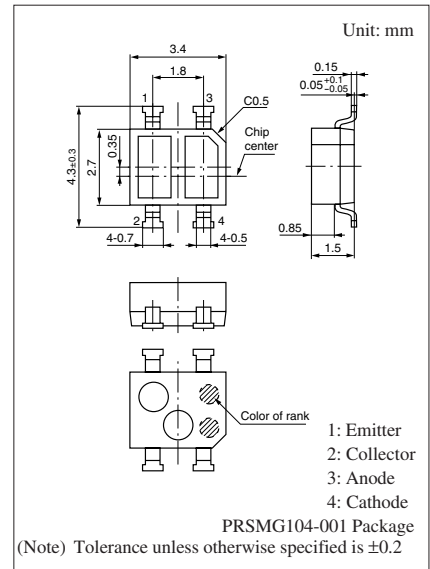
CNB1001 and CNB1002 are a small, thin SMD-compatible reflective photosensor consisting of a high efficiency GaAs infrared light emitting diode which is integrated with a high sensitivity Si phototransistor in a single resin package.

### ■ Features

- Reflow-compatible reflective photosensor
- Ultraminiature, thin type: 2.7 × 3.4 mm (height: 1.5 mm)
- Visible light cutoff resin is used

### ■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter	Symbol	Rating	Unit
Input (Light emitting diode)	Reverse voltage	$V_R$	6 V
	Forward current	$I_F$	50 mA
	Power dissipation *1	$P_D$	75 mW
Output (Photo transistor)	Collector-emitter voltage (Base open)	$V_{CEO}$	35 V
	Emitter-collector voltage (Base open)	$V_{ECO}$	6 V
	Collector current	$I_C$	20 mA
	Collector power dissipation *2	$P_C$	75 mW
Temperature	Operating ambient temperature	$T_{opr}$	-25 to +85 °C
	Storage temperature	$T_{stg}$	-40 to +100 °C



Note) \*1: Input power derating ratio is 1.0 mW/°C at  $T_a \geq 25^\circ\text{C}$ .  
 \*2: Output power derating ratio is 1.0 mW/°C at  $T_a \geq 25^\circ\text{C}$ .

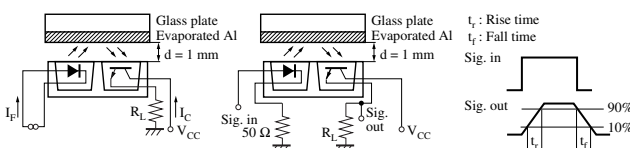
### ■ Electrical-Optical Characteristics $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Input characteristics	Forward voltage	$V_F$ $I_F = 20 \text{ mA}$		1.2	1.4	V
	Reverse current	$I_R$ $V_R = 3 \text{ V}$			10	$\mu\text{A}$
Output characteristics	Collector-emitter cutoff current (Base open)	$I_{CEO}$ $V_{CE} = 20 \text{ V}$			100	nA
Transfer characteristics	Collector current *1, *3	$I_C$ $V_{CC} = 2 \text{ V}, I_F = 4 \text{ mA}, R_L = 100 \Omega, d = 1 \text{ mm}$	23		160	$\mu\text{A}$
	Dark current	$I_D$ $V_{CC} = 2 \text{ V}, I_F = 4 \text{ mA}, R_L = 100 \Omega$			100	nA
	Collector-emitter saturation voltage	$V_{CE(sat)}$ $I_F = 20 \text{ mA}, I_C = 0.1 \text{ mA}$			0.4	V
	Rise time *2	$t_r$ $V_{CC} = 5 \text{ V}, I_C = 0.1 \text{ mA}$		30		$\mu\text{s}$
Fall time *2	$t_f$ $R_L = 1 \text{ k}\Omega$			40	$\mu\text{s}$	

Note) 1. Input and output are handled electrically.

2. This product is not designed to withstand radiation

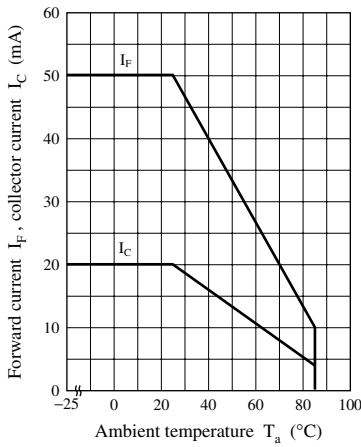
3. \*1: Output current measurement method      \*2: Switching time measurement circuit



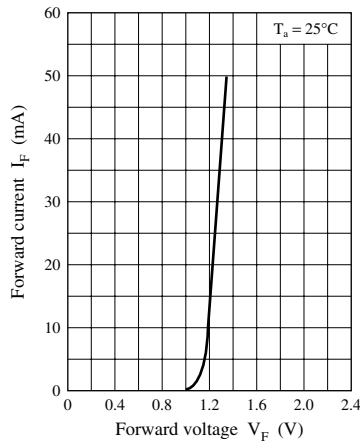
\*3: Rank classification

Rank	Q	R	S
$I_C$ ( $\mu\text{A}$ )	23 to 50	41 to 90	74 to 160
Color	Orange	White	Light blue

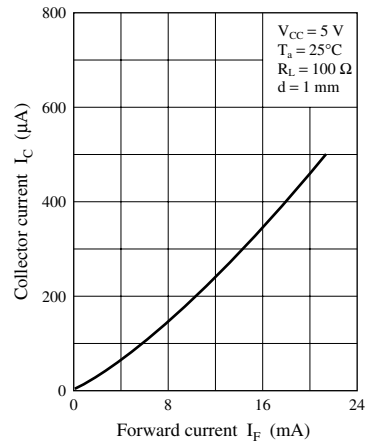
$I_F, I_C - T_a$



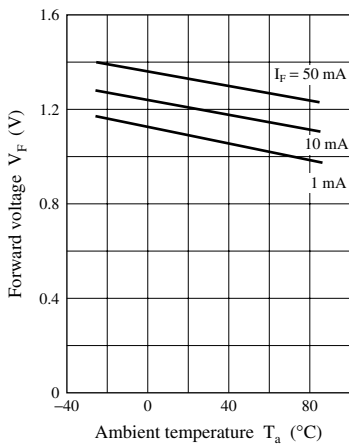
$I_F - V_F$



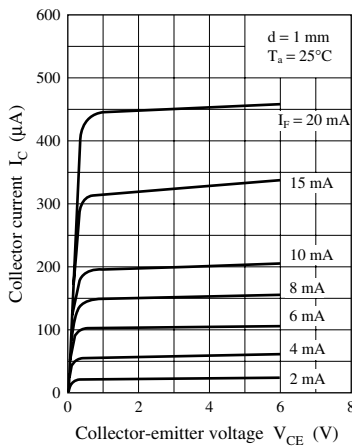
$I_C - I_F$



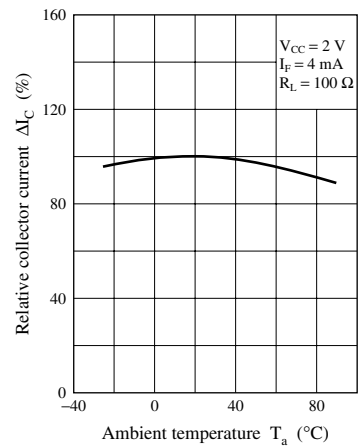
$V_F - T_a$



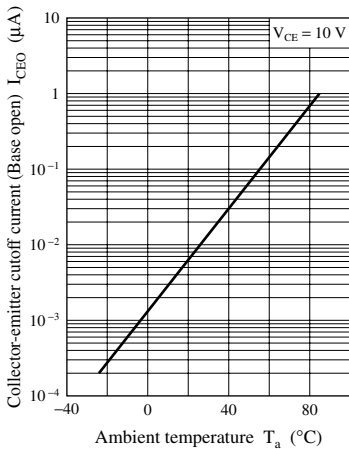
$I_C - V_{CE}$



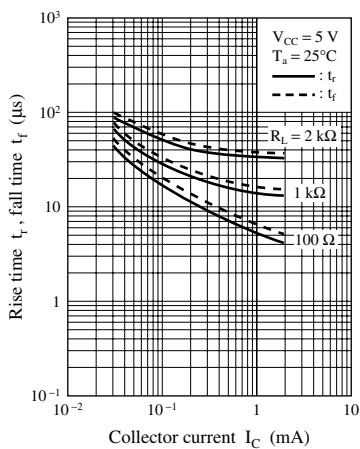
$\Delta I_C - T_a$



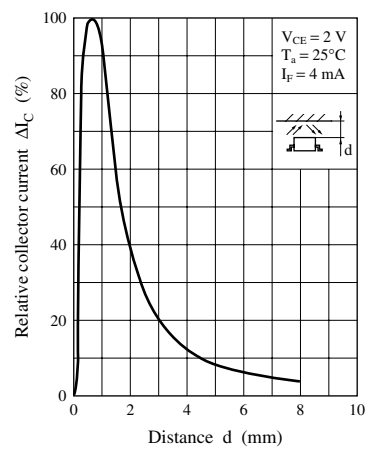
$I_{CEO} - T_a$



$t_r, t_f - I_C$



$\Delta I_C - d$



# Caution for Safety

 **DANGER**

## ■ This product contains Gallium Arsenide (GaAs).

GaAs powder and vapor are hazardous to human health if inhaled or ingested. Do not burn, destroy, cut, cleave off, or chemically dissolve the product. Follow related laws and ordinances for disposal. The product should be excluded from general industrial waste or household garbage.

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