

# CNB1302 (ON2170)

## Reflective photosensor

Non-contact point SW, object sensing

### Overview

CNB1302 is a small, thin 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

- Ultraminiature, thin type: 2.7 mm × 3.4 mm (height: 1.5 mm)
- Visible light cutoff resin is used
- Fast response:  $t_r$ ,  $t_f$  = 20  $\mu$ s (typ.)
- Easy interface for control circuit

### Applications

- Control of motor and other rotary units
- Detection of position and edge
- Detection of paper, film and cloth
- Start, end mark detection of magnetic tape

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

	Parameter	Symbol	Rating	Unit
Input (Light emitting diode)	Reverse voltage	$V_R$	3	V
	Forward current	$I_F$	50	mA
	Power dissipation	$P_D$	75	mW
Output (Photo transistor)	Collector-emitter voltage (Base open)	$V_{CEO}$	30	V
	Emitter-collector voltage (Base open)	$V_{ECO}$	5	V
	Collector current	$I_C$	20	mA
	Collector power dissipation	$P_C$	50	mW
Temperature	Operating ambient temperature	$T_{opr}$	-25 to +85	$^\circ\text{C}$
	Storage temperature	$T_{stg}$	-30 to +100	$^\circ\text{C}$

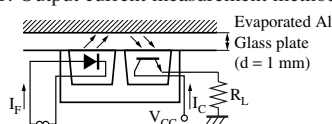
### Electrical-Optical Characteristics $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

	Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Input characteristics	Forward voltage	$V_F$	$I_F = 50 \text{ mA}$		1.3	1.5	V
	Reverse current	$I_R$	$V_R = 3 \text{ V}$		0.01	10.00	$\mu\text{A}$
	Terminal capacitance	$C_t$	$V_R = 0 \text{ V}$ , $f = 1 \text{ MHz}$		30		pF
Output characteristics	Collector-emitter cutoff current (Base open)	$I_{CEO}$	$V_{CE} = 10 \text{ V}$			200	nA
Transfer characteristics	Collector current *1, 2	$I_C$	$V_{CC} = 5 \text{ V}$ , $I_F = 10 \text{ mA}$ , $R_L = 100 \Omega$ , $d = 1 \text{ mm}$	90		880	$\mu\text{A}$
	Dark current	$I_D$	$V_{CC} = 5 \text{ V}$ , $I_F = 10 \text{ mA}$ , $R_L = 100 \Omega$			200	nA
	Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_F = 20 \text{ mA}$ , $I_C = 0.1 \text{ mA}$			0.4	V
	Rise time	$t_r$	$V_{CC} = 5 \text{ V}$ , $I_C = 0.1 \text{ mA}$		20		$\mu\text{s}$
	Fall time	$t_f$	$R_L = 100 \Omega$		20		$\mu\text{s}$

Note) 1. Input and output are handled electrically.

2. This product is not designed to withstand radiation

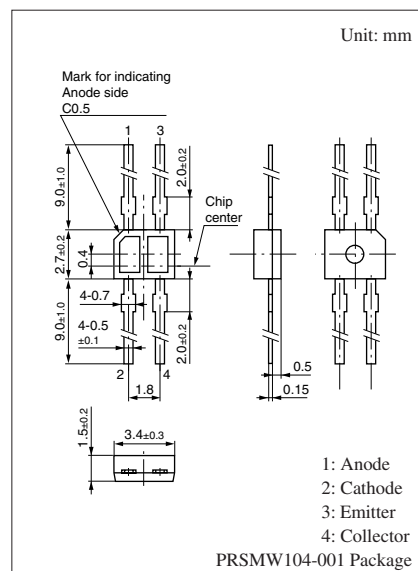
3. \*1: Output current measurement method

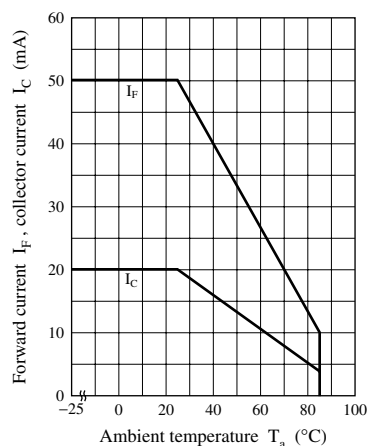
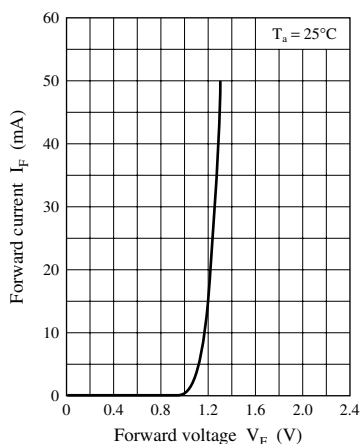
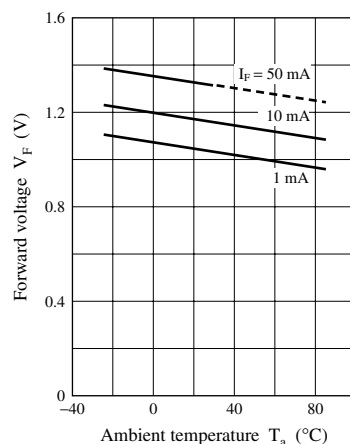
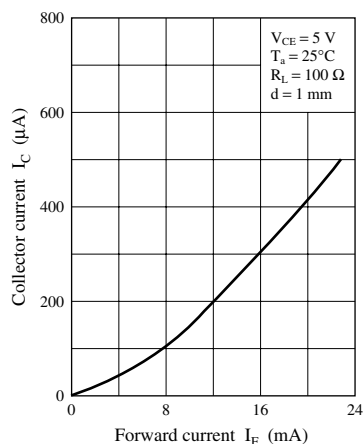
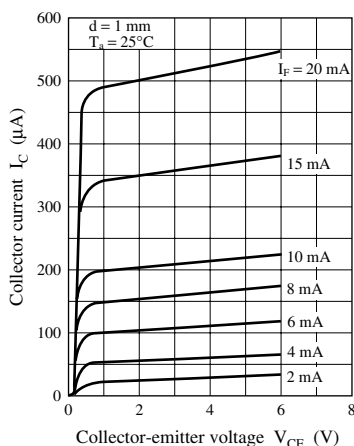
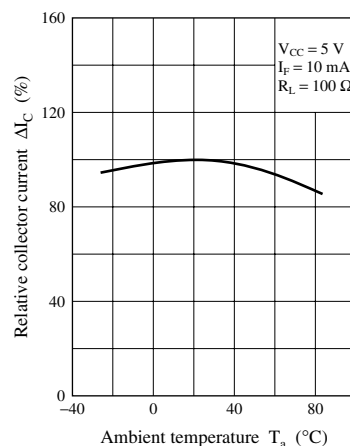
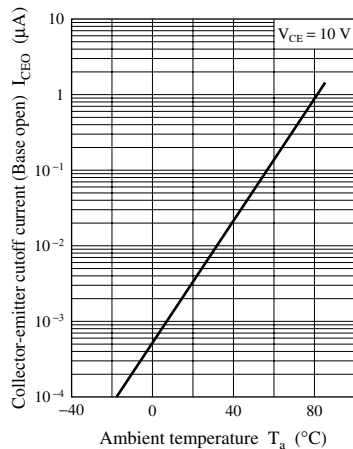
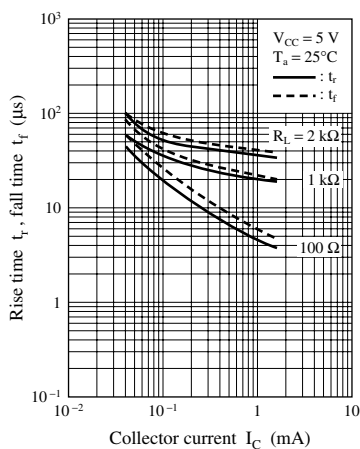
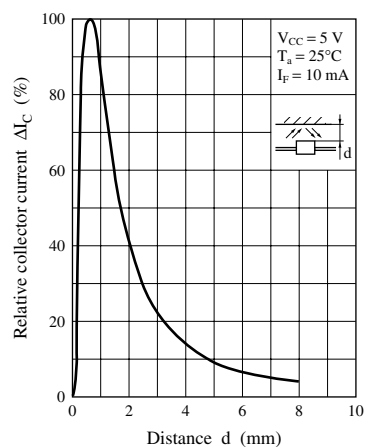


\*2: Rank classification

Rank	Q	R	S
$I_C$ ( $\mu\text{A}$ )	90 to 220	180 to 440	360 to 880
Color	Orange	White	Blue

Note) The part number in the parenthesis shows conventional part number.



$I_F, I_C - T_a$  $I_F - V_F$  $V_F - T_a$  $I_C - I_F$  $I_C - V_{CE}$  $\Delta I_C - T_a$  $I_{CEO} - T_a$  $t_r, t_f - I_C$  $\Delta I_C - d$ 

# 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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