

# CNB1303 (ON2180)

## Reflective Photosensor

### Overview

CNB1303 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 × 3.4 mm (height : 1.5 mm)
- Visible light cutoff resin is used
- Fast response :  $t_r, t_f = 20\mu\text{s}$  (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 (Ta = 25°C)

	Parameter	Symbol	Ratings	Unit
Input (Light emitting diode)	Reverse voltage (DC)	$V_R$	3	V
	Forward current (DC)	$I_F$	50	mA
	Power dissipation	$P_D^{*1}$	75	mW
Output (Photo transistor)	Collector current	$I_C$	20	mA
	Collector to emitter voltage	$V_{CEO}$	30	V
	Emitter to collector voltage	$V_{ECO}$	5	V
Temperature	Operating ambient temperature	$T_{opr}$	-25 to +85	°C
	Storage temperature	$T_{stg}$	-30 to +100	°C

### Electrical Characteristics (Ta = 25°C)

	Parameter	Symbol	Conditions	min	typ	max	Unit
Input characteristics	Forward voltage (DC)	$V_F$	$I_F = 50\text{mA}$		1.3	1.5	V
	Reverse current (DC)	$I_R$	$V_R = 3\text{V}$		0.01	10	$\mu\text{A}$
	Capacitance between terminals	$C_t$	$V_R = 0\text{V}, f = 1\text{MHz}$		30		pF
Output characteristics	Collector cutoff current	$I_{CEO}$	$V_{CE} = 10\text{V}$			200	nA
Transfer characteristics	Collector current	$I_C^{*1, *2}$	$V_{CC} = 5\text{V}, I_F = 10\text{mA}, R_L = 100\Omega, d = 1\text{mm}$	90		880	$\mu\text{A}$
	Leakage current	$I_D$	$V_{CC} = 5\text{V}, I_F = 10\text{mA}, R_L = 100\Omega$			200	nA
	Response time	$t_r^{*3}, t_f^{*4}$	$V_{CC} = 5\text{V}, I_C = 0.1\text{mA}, R_L = 100\Omega$		20		$\mu\text{s}$
	Collector to emitter saturation voltage	$V_{CE(sat)}$	$I_F = 20\text{mA}, I_C = 0.1\text{mA}$			0.4	V

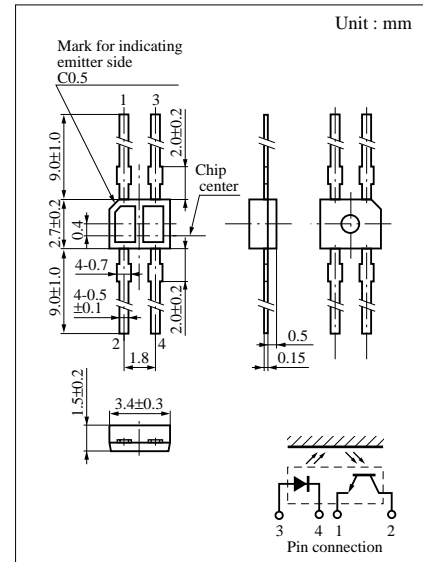
\*1  $I_C$  classifications

Class	Q	R	S
$I_C$ ( $\mu\text{A}$ )	90 to 220	180 to 440	360 to 880

\*3 Time required for the output current to increase from 10% to 90% of its final value

\*4 Time required for the output current to decrease from 90% to 10% of its initial value

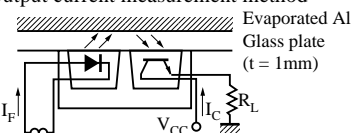
Note) The part number in the parenthesis shows conventional part number.

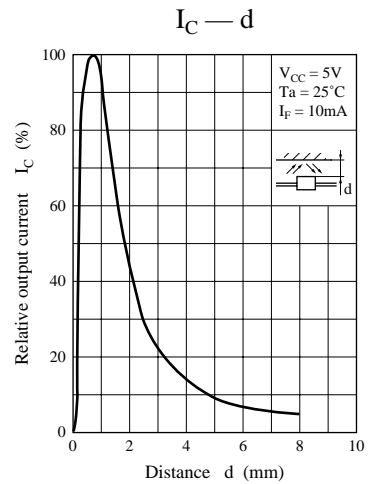
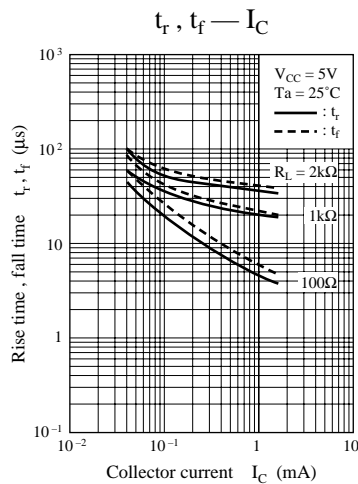
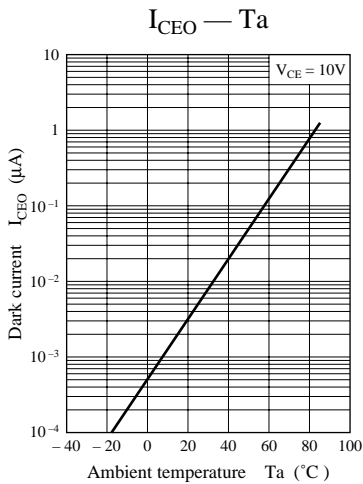
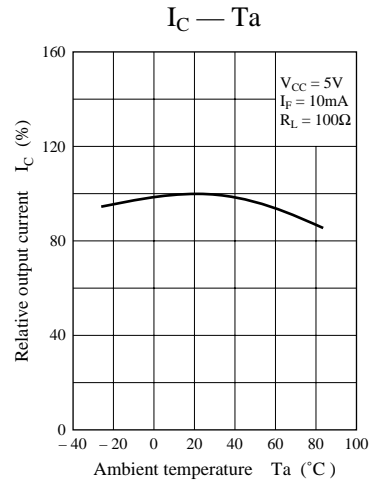
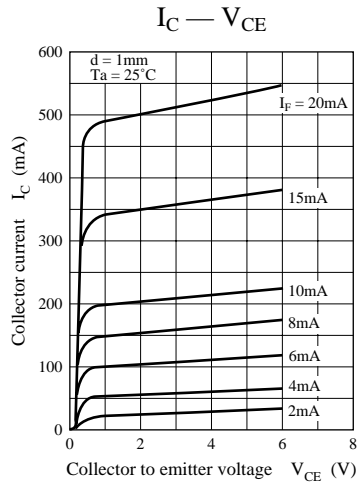
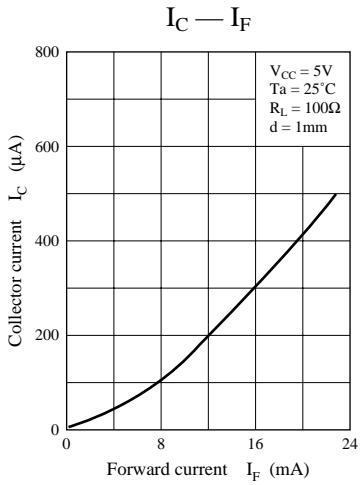
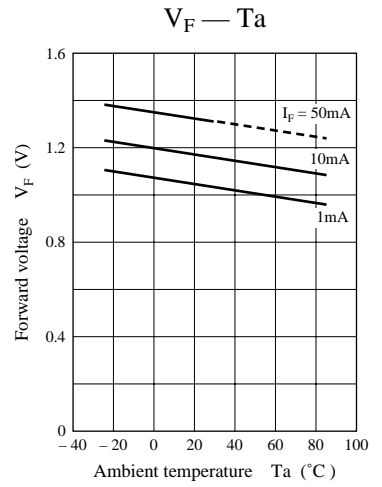
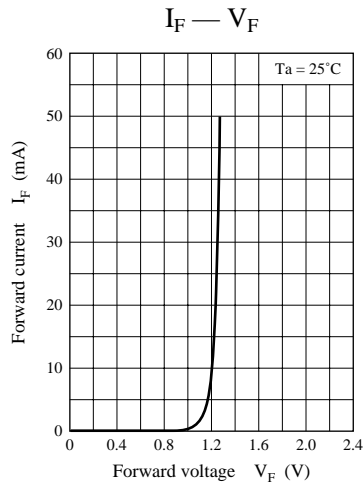
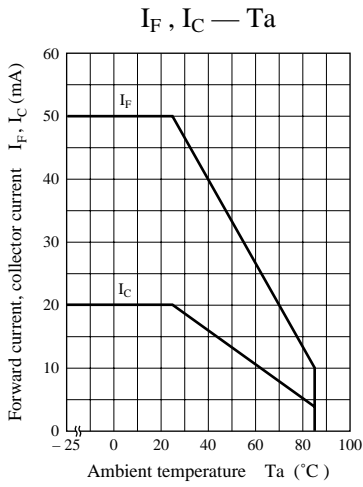


\*1 Input power derating ratio is 1.0 mW/°C at Ta ≥ 25°C.

\*2 Output power derating ratio is 0.67 mW/°C at Ta ≥ 25°C.

\*2 Output current measurement method





# Caution for Safety

 **DANGER**

Gallium arsenide material (GaAs) is used in this product.

Therefore, do not burn, destroy, cut, crush, or chemically decompose the product, since gallium arsenide material in powder or vapor form is harmful to human health.

Observe the relevant laws and regulations when disposing of the products. Do not mix them with ordinary industrial waste or household refuse when disposing of GaAs-containing products.

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