

# CNB2301 (ON2270)

## Reflective Photosensor

### Overview

CNB2301 is a small, thin reflective photosensor consisting of a high efficiency GaAs infrared light emitting diode which is integrated with a high sensitivity Darlington phototransistor used as the photo detector in a single resin package.

### Features

- Ultraminiature : 2.7 × 3.4 mm
- Visible light cutoff resin is used
- High current-transfer ratio

### Applications

- Detection of paper, film and cloth
- Detection of position and edge
- Detection of rotary positioning
- Liquid level sensor
- 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	$I_C$	30	mA
	Collector to emitter voltage	$V_{CEO}$	20	V
	Emitter to collector voltage	$V_{ECO}$	5	V
Temperature	Collector power dissipation	$P_C^{*2}$	75	mW
	Operating ambient temperature	$T_{opr}$	-25 to +85	°C
	Storage temperature	$T_{stg}$	-30 to +100	°C

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

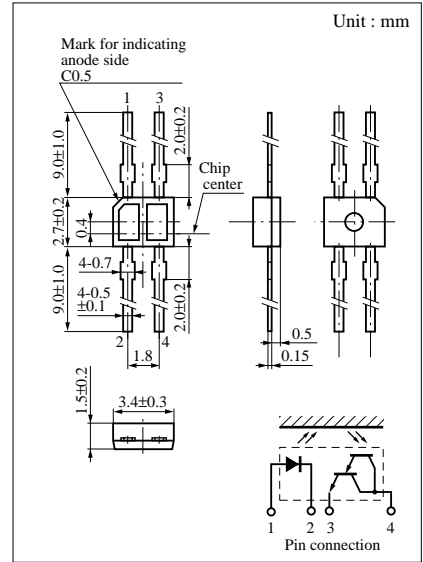
	Parameter	Symbol	Conditions	min	typ	max	Unit
Input characteristics	Forward voltage (DC)	$V_F$	$I_F = 50\text{mA}$		1.3	1.5	V
	Reverse current (DC)	$I_R$	$V_R = 3\text{V}$		0.01	10	$\mu\text{A}$
	Capacitance between terminals	$C_t$	$V_R = 0\text{V}, f = 1\text{MHz}$		30		pF
Output characteristics	Collector cutoff current	$I_{CEO}$	$V_{CE} = 10\text{V}$			1.0	$\mu\text{A}$
	Collector current	$I_C^{*1, *2}$	$V_{CC} = 5\text{V}, I_F = 2\text{mA}, R_L = 100\Omega, d = 1\text{mm}$	0.46		12.0	mA
Transfer characteristics	Leakage current	$I_D$	$V_{CC} = 5\text{V}, I_F = 2\text{mA}, R_L = 100\Omega$			2.0	$\mu\text{A}$
	Response time	$t_r^{*3}, t_f^{*4}$	$V_{CC} = 10\text{V}, I_C = 1\text{mA}, R_L = 100\Omega$		150		$\mu\text{s}$
	Collector to emitter saturation voltage	$V_{CE(sat)}$	$I_F = 5\text{mA}, I_C = 0.5\text{mA}$			1.5	V

\*1  $I_C$  classifications

Class	Q	R	S
$I_C$ (mA)	0.46 to 1.75	1.3 to 4.95	3.15 to 12.0

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

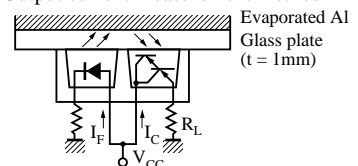
\*4 Time required for the output current to decrease from 90% to 10% of its initial value



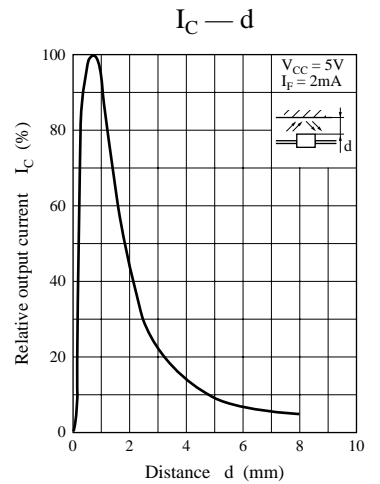
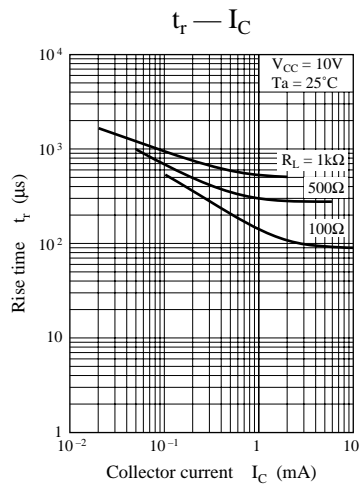
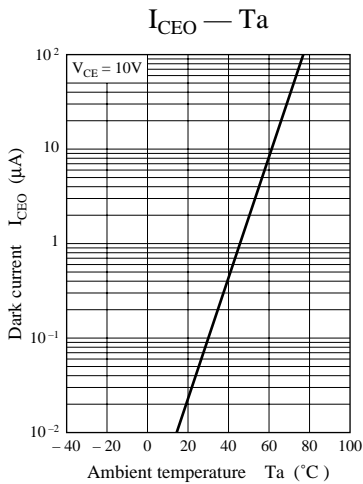
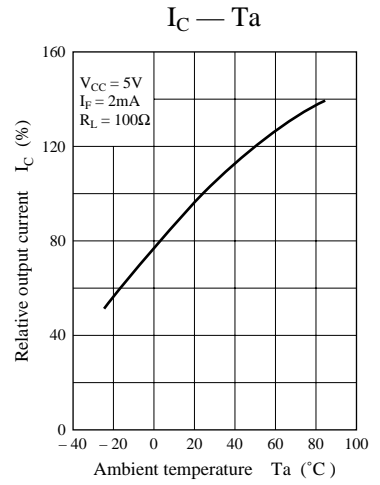
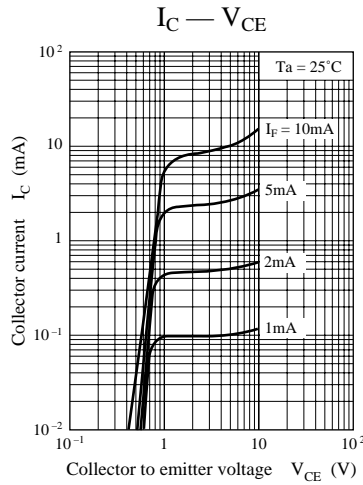
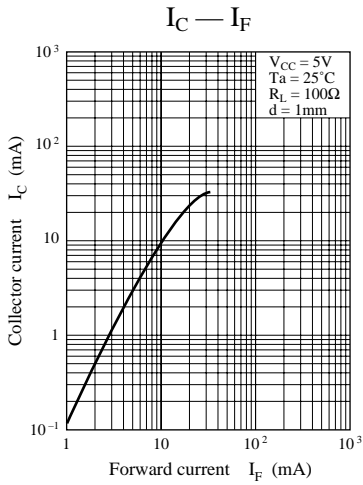
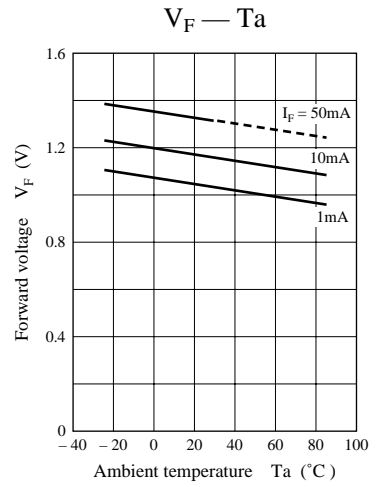
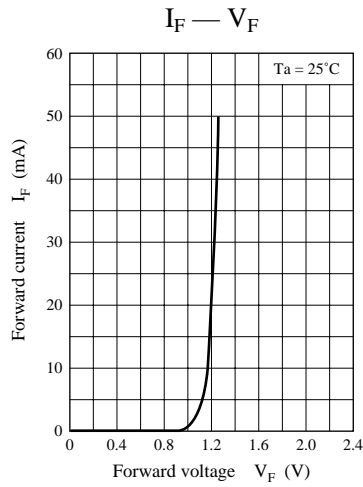
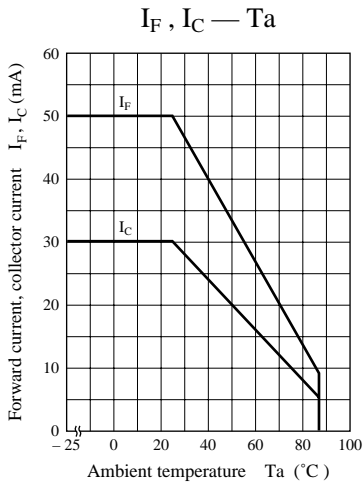
\*1 Input power derating ratio is 1.0 mW/°C at Ta ≥ 25°C.

\*2 Output power derating ratio is 1.0 mW/°C at Ta ≥ 25°C.

\*2 Output current measurement method



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



# 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.

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