

# CNB2301

## 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
	Collector power dissipation	$P_C^{*2}$	75	mW
Temperature	Operating ambient temperature	$T_{opr}$	-25 to +85	°C
	Storage temperature	$T_{stg}$	-30 to +100	°C

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

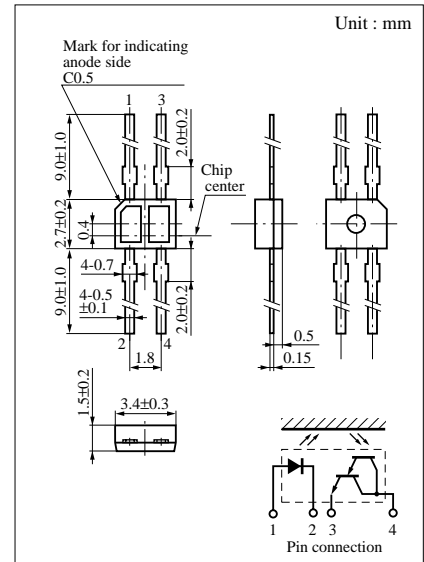
Parameter		Symbol	Conditions	min	typ	max	Unit
Input characteristics	Forward voltage (DC)	$V_F$	$I_F = 50\text{mA}$		1.3	1.5	V
	Reverse current (DC)	$I_R$	$V_R = 3\text{V}$		0.01	10	$\mu\text{A}$
	Capacitance between terminals	$C_i$	$V_R = 0\text{V}, f = 1\text{MHz}$		30		pF
Output characteristics	Collector cutoff current	$I_{CEO}$	$V_{CE} = 10\text{V}$			1.0	$\mu\text{A}$
Transfer characteristics	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
	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

