

# CNB1301 (ON2171)

## Reflective Photosensor

For contactless SW and object detection

### ■ Overview

CNB1301 is a reflective photosensor consisting of a small, thin reflective photosensor (CNB1302) to which a plastic lens is attached to increase the focal distance from 0.8 mm to 2.5 mm.

### ■ Features

- Small size, light weight: 5 mm × 4.5 mm (height: 4.0 mm)
- Focal distance: 2.5 mm
- Visible light cutoff resin is used

### ■ Applications

- Copier
- Printers
- Fax
- Cassette deck

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

Parameter		Symbol	Rating	Unit
Input (Light emitting diode)	Power dissipation *1	$P_D$	75	mW
	Forward current	$I_F$	50	mA
	Reverse voltage	$V_R$	3	V
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 *2	$P_C$	50	mW
Operating ambient temperature		$T_{opr}$	-25 to +75	$^\circ\text{C}$
Storage temperature		$T_{stg}$	-30 to +80	$^\circ\text{C}$

Note) \*1: Input power derating ratio is 1.36 mW/ $^\circ\text{C}$  at  $T_a \geq 25^\circ\text{C}$

\*2: Output power derating ratio is 0.91 mW/ $^\circ\text{C}$  at  $T_a \geq 25^\circ\text{C}$

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

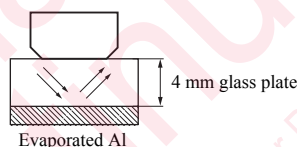
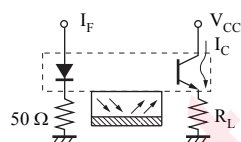
■ Electrical-Optical Characteristics  $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$ 

Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Input characteristics	Reverse current	$I_R$	$V_R = 3\text{ V}$			10	$\mu\text{A}$
	Forward voltage	$V_F$	$I_F = 50\text{ mA}$		1.3	1.5	V
Output characteristics	Collector-emitter cutoff current (Base open)	$I_{\text{CEO}}$	$V_{\text{CE}} = 10\text{ V}$			200	nA
Transfer characteristics	Collector current ratio <sup>*1</sup>	$I_C$	$V_{\text{CC}} = 5\text{ V}$ , $I_F = 10\text{ mA}$ , $R_L = 100\ \Omega$ , $d = 4\text{ mm}$	0.8		5.2	mA
	Drain current <sup>*2</sup>	$I_D$	$V_{\text{CC}} = 5\text{ V}$ , $I_F = 10\text{ mA}$ , $R_L = 100\ \Omega$			40	$\mu\text{A}$
	Collector-emitter saturation voltage	$V_{\text{CE(sat)}}$	$I_F = 20\text{ mA}$ , $I_C = 0.1\text{ mA}$			0.5	V
	Rise time <sup>*3</sup>	$t_r$	$V_{\text{CC}} = 5\text{ V}$ , $I_C = 0.1\text{ mA}$ , $R_L = 100\ \Omega$		20		$\mu\text{s}$
	Fall time <sup>*3</sup>	$t_f$			20		$\mu\text{s}$

Note) 1. Input and output are practiced by electricity.

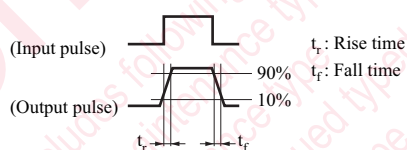
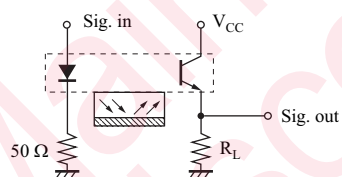
2. This device is designed by disregarding radiation.

3. \*1: Output current measurement circuit



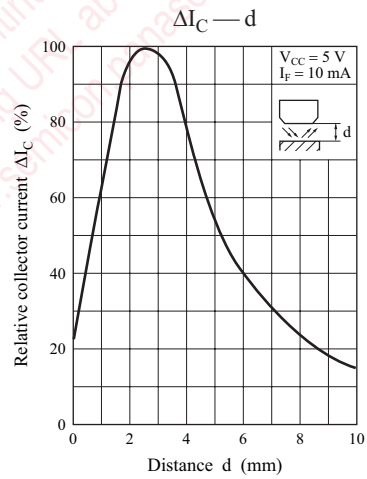
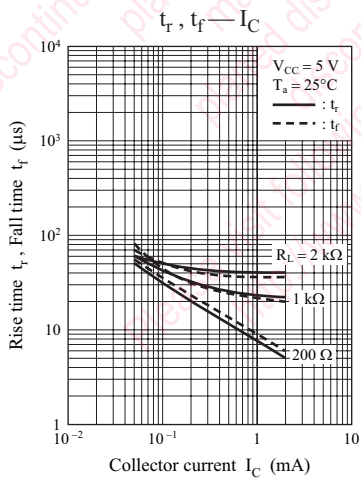
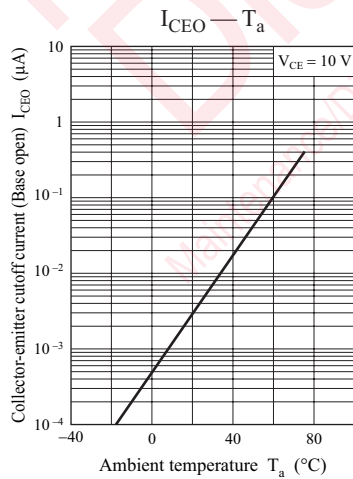
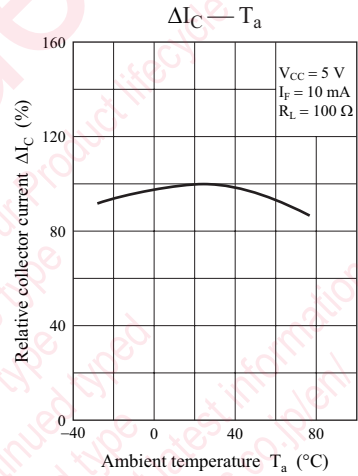
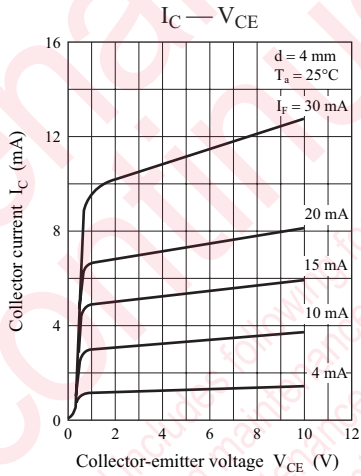
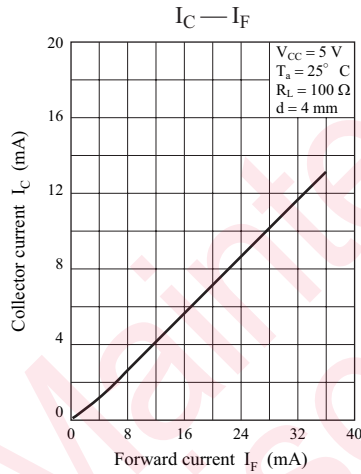
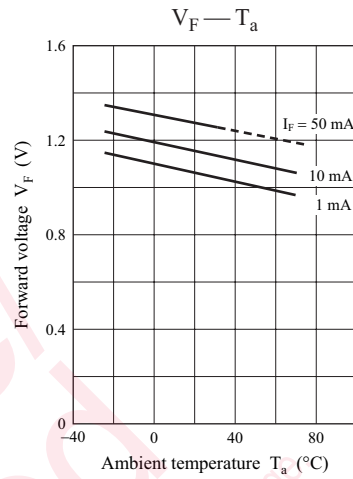
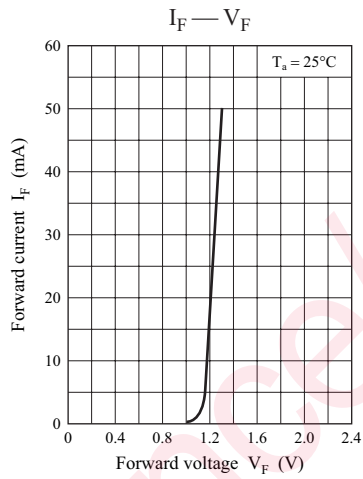
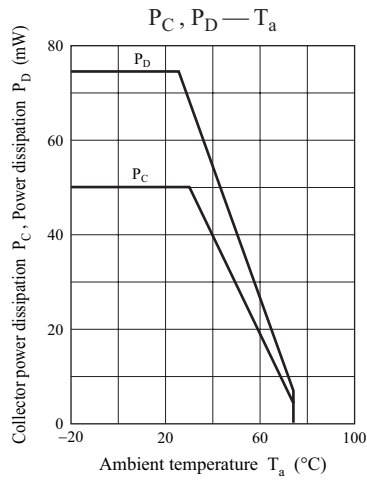
\*2: No reflector and dark condition.

\*3: Switching time measurement circuit



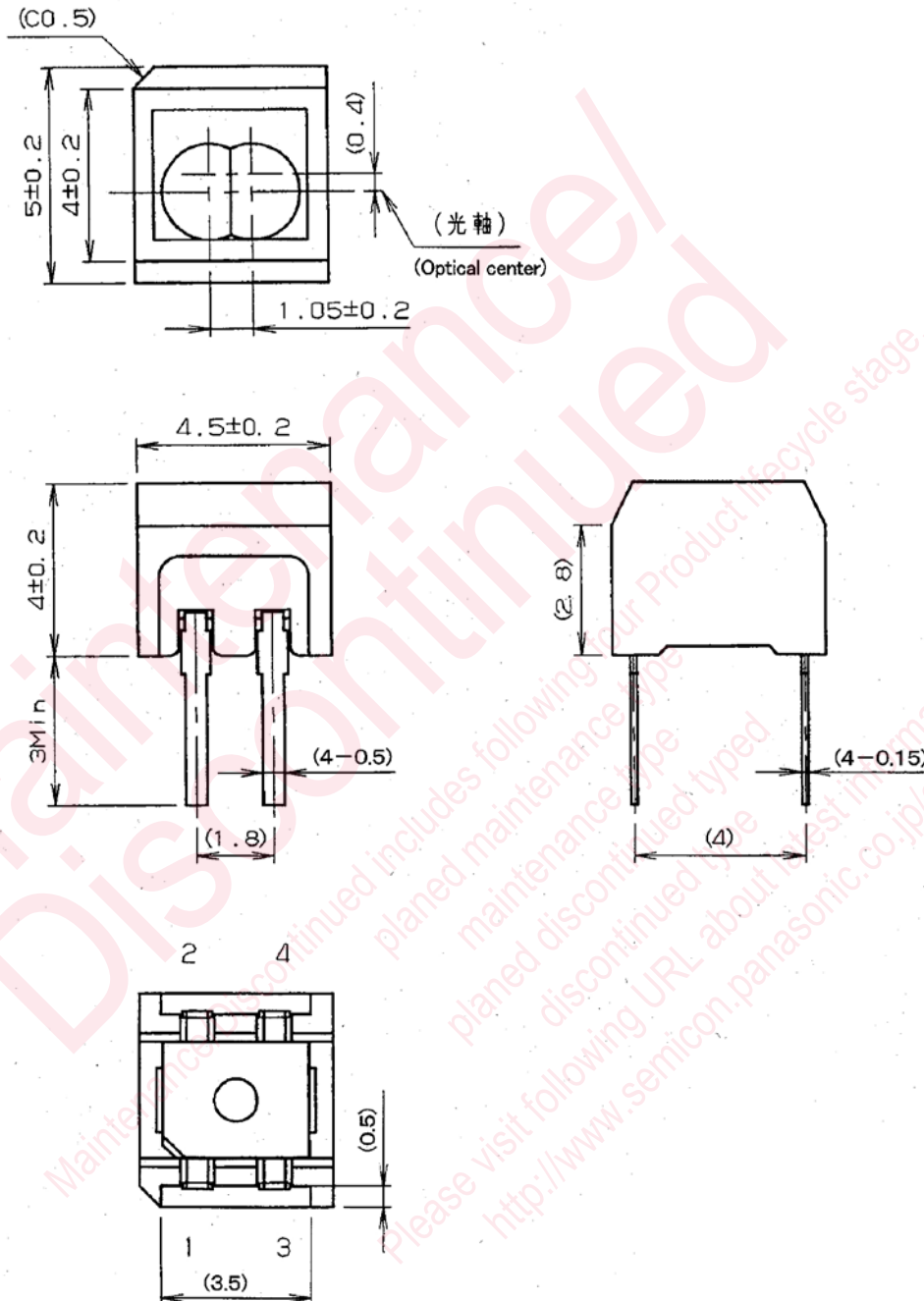
$t_r$ : Time required for the collector current to increase from 10% to 90% of its final value

$t_f$ : Time required for the collector current to decrease from 90% to 10% of its initial value



## ■ Package (Unit: mm)

## LSSLRR4S0001



## • Pin name

- 1: Anode
- 2: Cathode
- 3: Emitter
- 4: Collector

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