

# CNB2301 (ON2270)

## Reflective Photosensor

For contactless SW and object detection

### ■ 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 mm × 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
- Liquid level sensor
- Detection of rotary positioning
- Start, end mark detection of magnetic tape

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

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

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

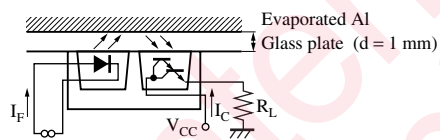
■ Electrical-Optical Characteristics  $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$ 

| Parameter                |  | Symbol        | Conditions   | Min  | Typ  | Max  | Unit          |
|--------------------------|--|---------------|--|------|------|------|---------------|
| Input characteristics    | Reverse current                              | $I_R$         | $V_R = 3 \text{ V}$  |      | 0.01 | 10   | $\mu\text{A}$ |
|                          | Forward voltage                              | $V_F$         | $I_F = 50 \text{ mA}$  |      | 1.3  | 1.5  | V             |
|                          | Terminal capacitance                         | $C_T$         | $V_R = 0 \text{ V}, f = 1 \text{ MHz}$   |      | 30   |      | pF            |
| Output characteristics   | Collector-emitter cutoff current (Base open) | $I_{CEO}$     | $V_{CE} = 10 \text{ V}$  |      |      | 1.0  | $\mu\text{A}$ |
| Transfer characteristics | Collector current *1, *2                     | $I_C$         | $V_{CC} = 5 \text{ V}, I_F = 2 \text{ mA}, R_L = 100 \Omega, d = 1 \text{ mm}$ | 0.46 |      | 12.0 | mA            |
|                          | Drain current                                | $I_D$         | $V_{CC} = 5 \text{ V}, I_F = 2 \text{ mA}, R_L = 100 \Omega$                   |      |      | 2.0  | $\mu\text{A}$ |
|                          | Collector-emitter saturation voltage         | $V_{CE(sat)}$ | $I_F = 5 \text{ mA}, I_C = 0.5 \text{ mA}$                                     |      |      | 1.5  | V             |
|                          | Rise time                                    | $t_r$         | $V_{CC} = 10 \text{ V}, I_C = 1 \text{ mA}, R_L =$                             |      | 150  |      | $\mu\text{s}$ |
|                          | Fall time                                    | $t_f$         | $100 \Omega$   |      | 150  |      | $\mu\text{s}$ |

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

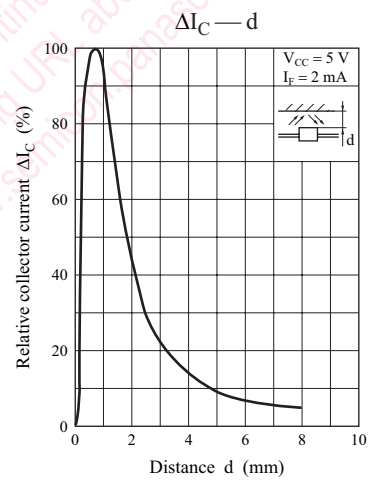
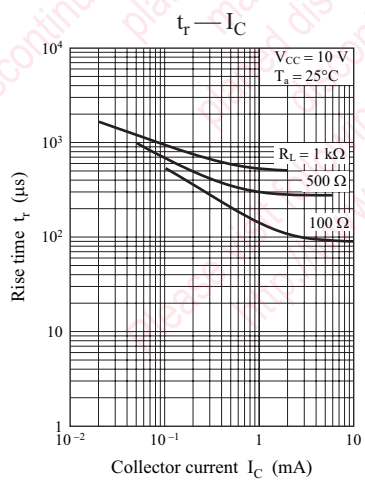
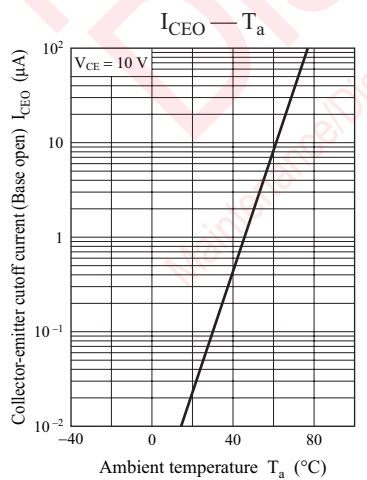
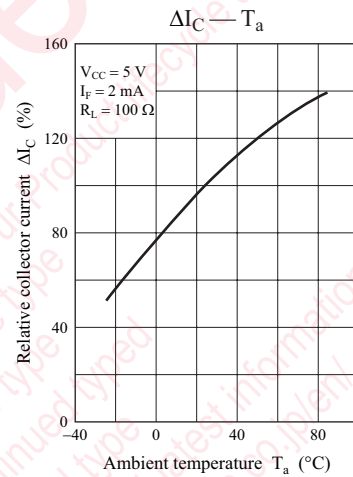
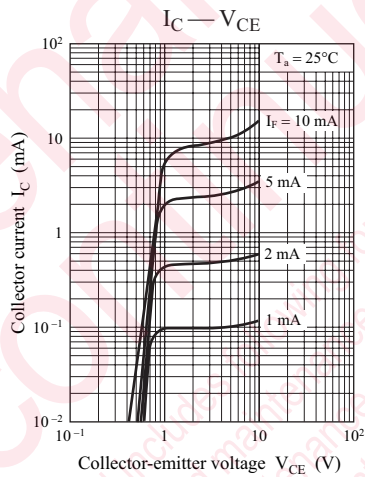
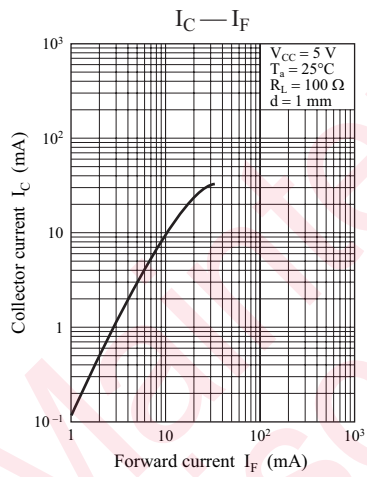
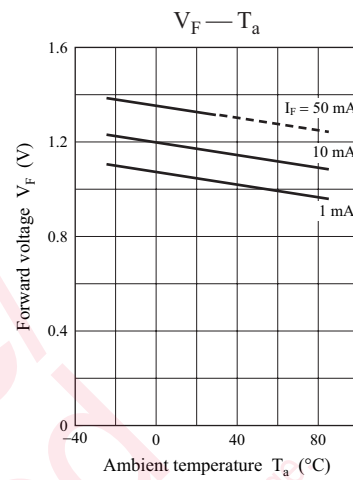
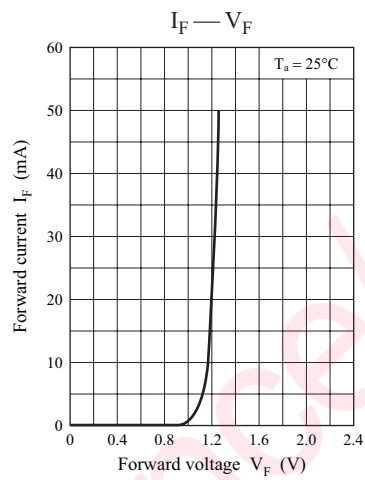
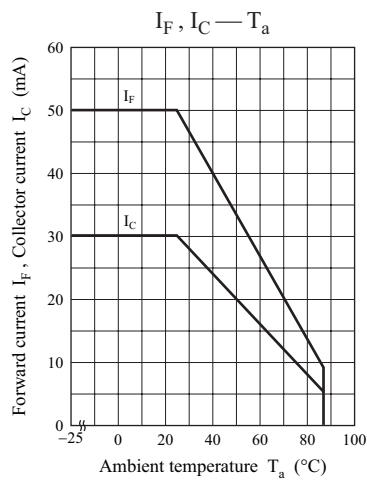
2. This device is designed by disregarding radiation.

3. \*1: Output current measurement circuit



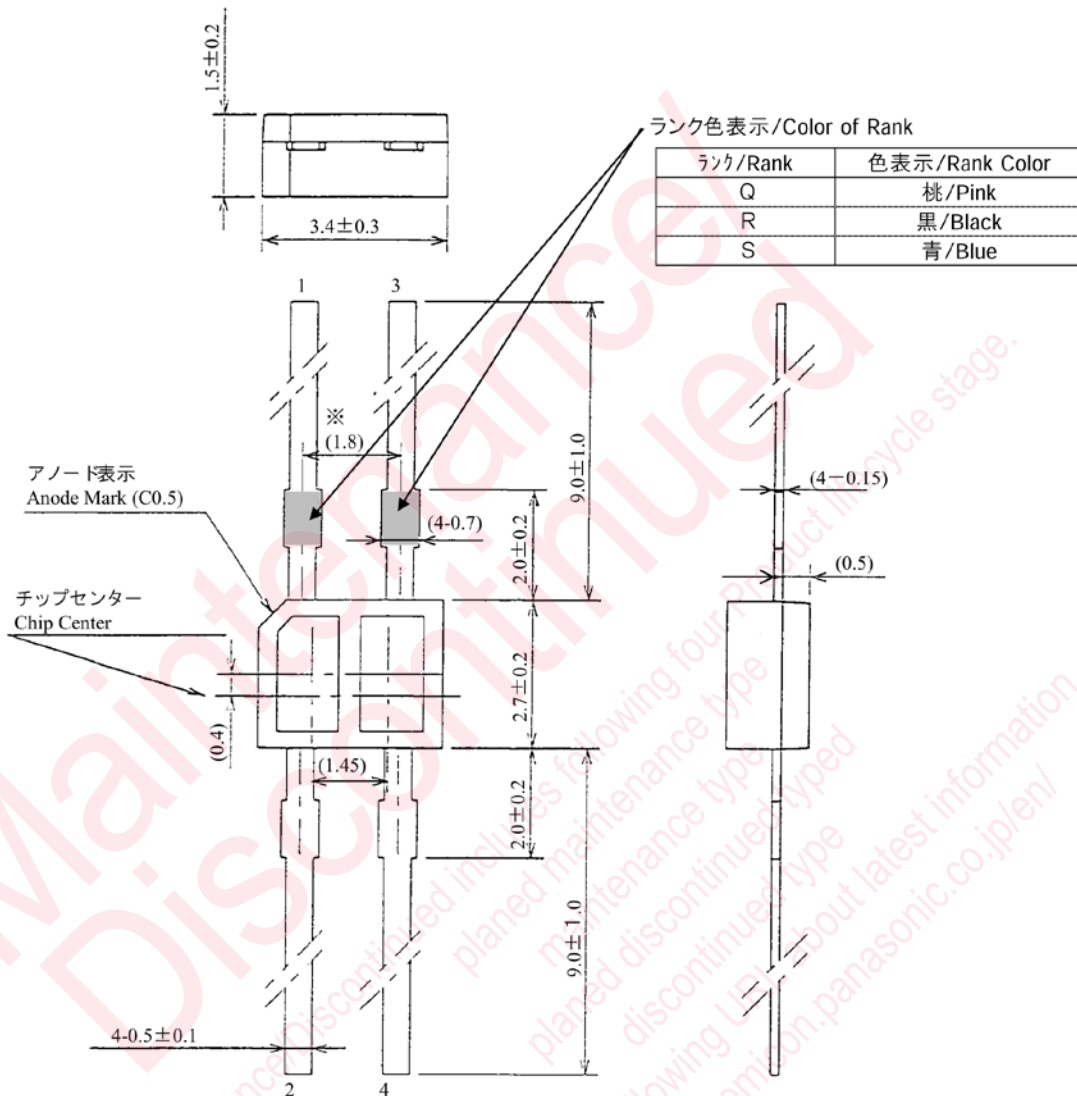
\*2: Rank classification

| Rank       | Q            | R            | S            |
|------------|--------------|--------------|--------------|
| $I_C$ (mA) | 0.46 to 1.75 | 1.30 to 4.95 | 3.15 to 12.0 |
| Color      | Pink         | Black        | Blue         |



## ■ Package (Unit: mm)

## LSMFRN4S0001



(注 1) ※リード根元寸法とします。

(Note1) ※Indicates root dimensions of lead.

(注 2) ランク色表示は、目視又は顕微鏡に於いて解読できる事。

(Note2) What rank color a sees an attention and can decode in a microscope.

## ● Pin name

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

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