

# CNB1302 (ON2170)

## Reflective Photosensor

For contactless SW and object detection

### ■ Overview

CNB1302 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 mm × 3.4 mm (height: 1.5 mm)
- Visible light cutoff resin is used
- Fast response:  $t_r$ ,  $t_f$  = 20  $\mu$ 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 $T_a = 25^\circ\text{C}$

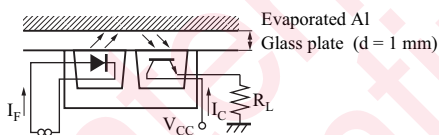
| Parameter                       |  | Symbol    | Rating      | Unit             |
|---------------------------------|--|-----------|-------------|------------------|
| Input<br>(Light emitting diode) | Power dissipation                        | $P_D$     | 75          | mW               |
|                                 | Forward current                          | $I_F$     | 50          | mA               |
|                                 | Reverse voltage                          | $V_R$     | 3           | V                |
| Output<br>(Photo transistor)    | Collector-emitter voltage<br>(Base open) | $V_{CEO}$ | 30          | V                |
|                                 | Emitter-collector voltage<br>(Base open) | $V_{ECO}$ | 5           | V                |
|                                 | Collector current                        | $I_C$     | 20          | mA               |
|                                 | Collector power dissipation              | $P_C$     | 50          | 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  $T_a = 25^{\circ}\text{C} \pm 3^{\circ}\text{C}$

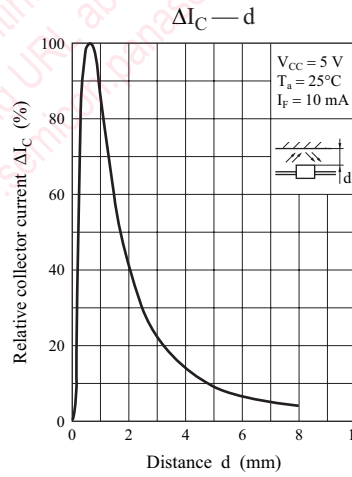
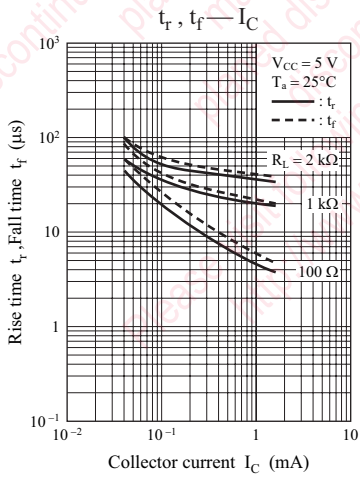
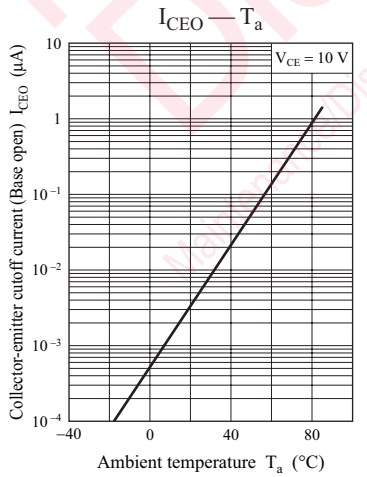
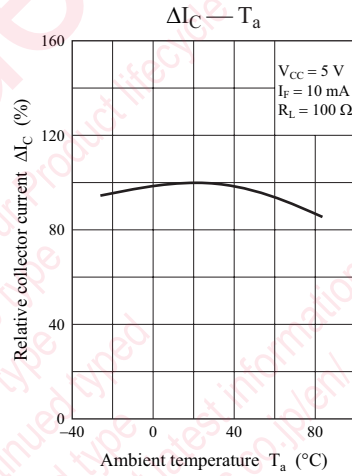
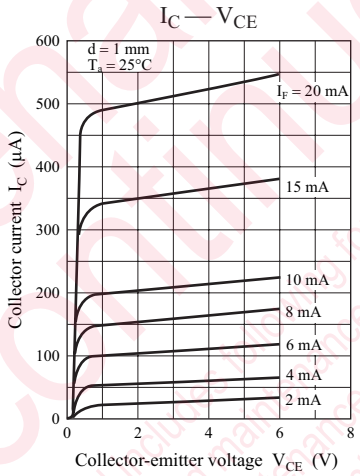
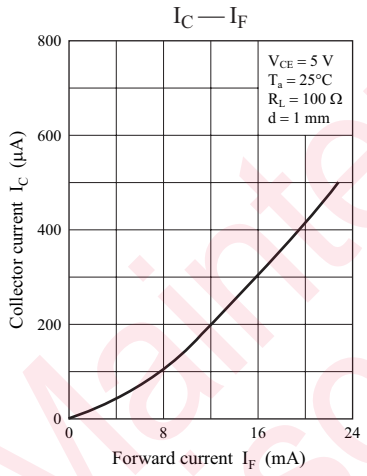
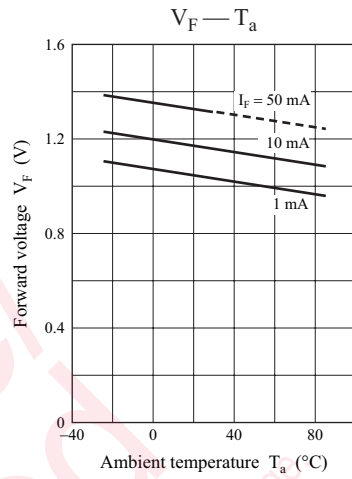
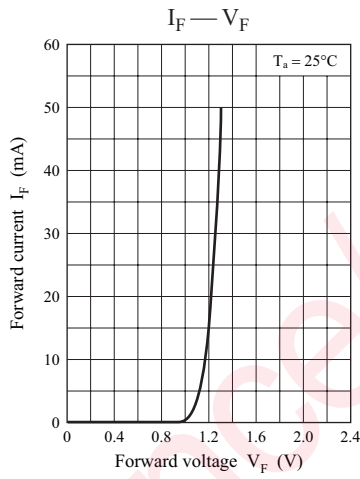
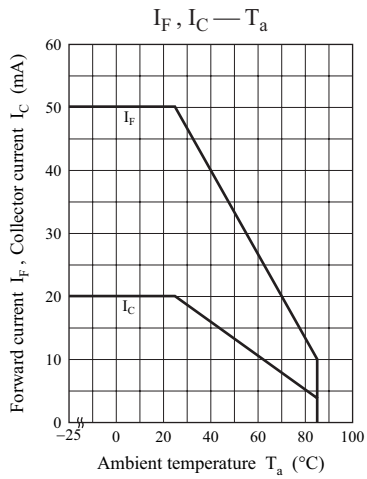
| Parameter                |  | Symbol        | Conditions  | Min | Typ  | Max | Unit          |
|--------------------------|--|---------------|---|-----|------|-----|---------------|
| Input characteristics    | Reverse current                              | $I_R$         | $V_R = 3 \text{ V}$   |     | 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) | $I_{CEO}$     | $V_{CE} = 10 \text{ V}$   |     |      | 200 | nA            |
| Transfer characteristics | Collector current *1, *2                     | $I_C$         | $V_{CC} = 5 \text{ V}, I_F = 10 \text{ mA}, R_L = 100 \Omega, d = 1 \text{ mm}$ | 90  |      | 880 | $\mu\text{A}$ |
|                          | Drain current                                | $I_D$         | $V_{CC} = 5 \text{ V}, I_F = 10 \text{ mA}, R_L = 100 \Omega$                   |     |      | 200 | nA            |
|                          | Collector-emitter saturation voltage         | $V_{CE(sat)}$ | $I_F = 20 \text{ mA}, I_C = 0.1 \text{ mA}$                                     |     |      | 0.4 | V             |
|                          | Rise time                                    | $t_r$         | $V_{CC} = 5 \text{ V}, I_C = 0.1 \text{ mA}, R_L = 100 \Omega$                  |     | 20   |     | $\mu\text{s}$ |
|                          | Fall time                                    | $t_f$         | $R_L = 100 \Omega$  |     | 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



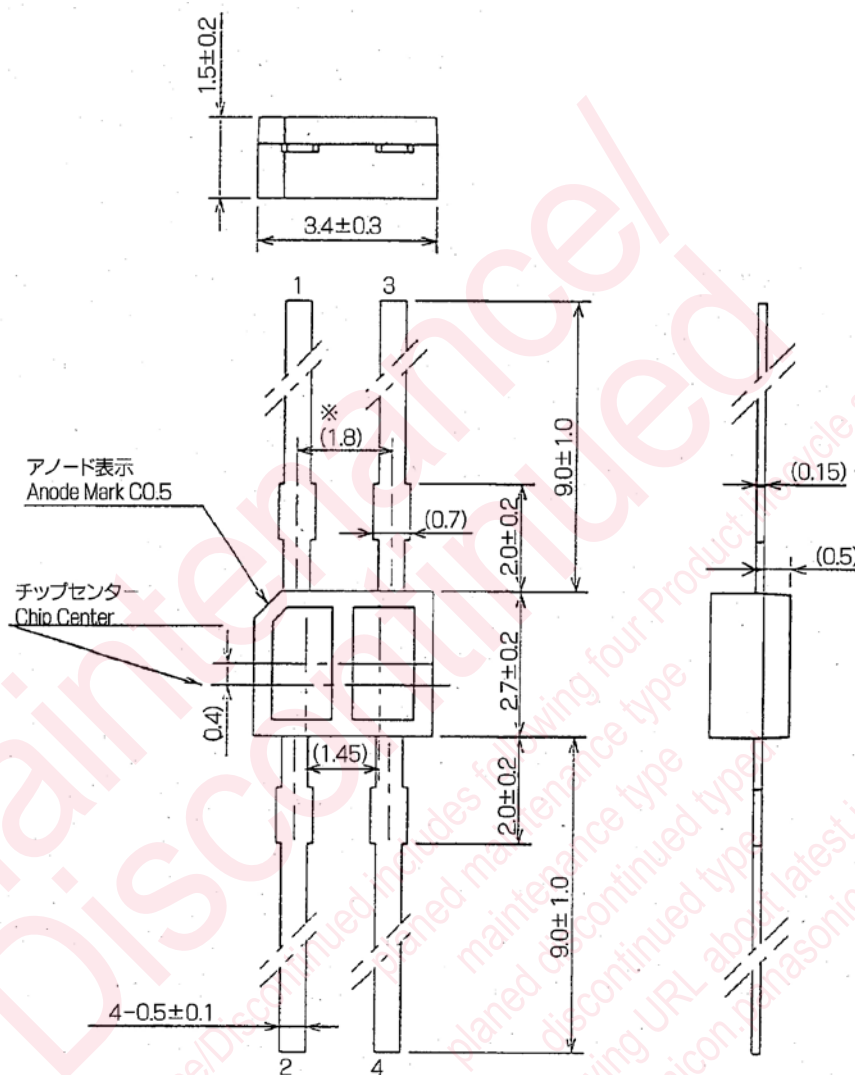
\*2: Rank classification

| Rank                | Q         | R          | S          |
|---------------------|-----------|------------|------------|
| $I_C (\mu\text{A})$ | 90 to 220 | 180 to 440 | 360 to 880 |
| Color               | Orange    | White      | 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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