

CNB1302 (ON2170)

Reflective Photosensor

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 × 3.4 mm (height : 1.5 mm)
- Visible light cutoff resin is used
- Fast response : $t_r, t_f = 20\mu\text{s}$ (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 (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 | 20 | mA |
| | Collector to emitter voltage | V_{CEO} | 30 | V |
| | Emitter to collector voltage | V_{ECO} | 5 | V |
| Temperature | Collector power dissipation | P_C^{*2} | 50 | mW |
| | Operating ambient temperature | T_{opr} | -25 to +85 | °C |
| | Storage temperature | T_{stg} | -30 to +100 | °C |

Electrical Characteristics (Ta = 25°C)

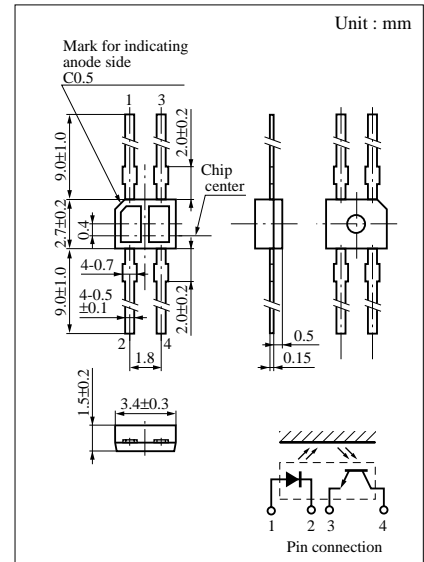
| | Parameter | Symbol | Conditions | min | typ | max | Unit |
|--------------------------|---|----------------------|--|-----|------|-----|---------------|
| Input characteristics | Forward voltage (DC) | V_F | $I_F = 50\text{mA}$ | | 1.3 | 1.5 | V |
| | Reverse current (DC) | I_R | $V_R = 3\text{V}$ | | 0.01 | 10 | μA |
| | Capacitance between terminals | C_t | $V_R = 0\text{V}, f = 1\text{MHz}$ | | 30 | | pF |
| Output characteristics | Collector cutoff current | I_{CEO} | $V_{CE} = 10\text{V}$ | | | 200 | nA |
| Transfer characteristics | Collector current | $I_C^{*1, *2}$ | $V_{CC} = 5\text{V}, I_F = 10\text{mA}, R_L = 100\Omega, d = 1\text{mm}$ | 90 | | 880 | μA |
| | Leakage current | I_D | $V_{CC} = 5\text{V}, I_F = 10\text{mA}, R_L = 100\Omega$ | | | 200 | nA |
| | Response time | t_r^{*3}, t_f^{*4} | $V_{CC} = 5\text{V}, I_C = 0.1\text{mA}, R_L = 100\Omega$ | | 20 | | μs |
| | Collector to emitter saturation voltage | $V_{CE(sat)}$ | $I_F = 20\text{mA}, I_C = 0.1\text{mA}$ | | | 0.4 | V |

*1 I_C classifications

| Class | Q | R | S |
|-------------------------|-----------|------------|------------|
| I_C (μA) | 90 to 220 | 180 to 440 | 360 to 880 |

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

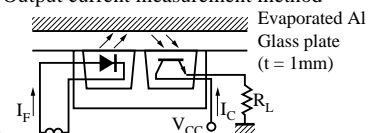
*4 Time required for the output current to decrease from 90% to 10% of its initial value



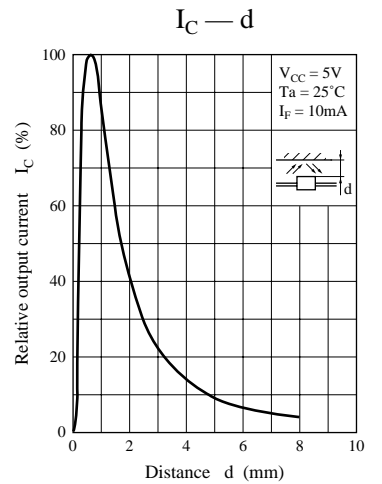
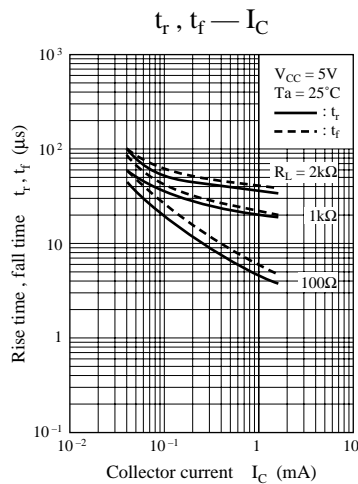
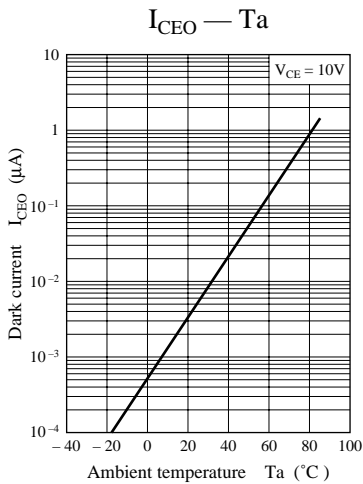
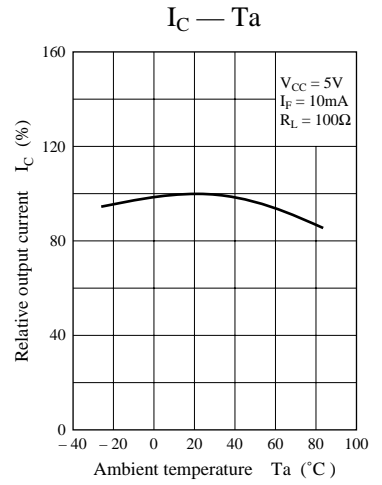
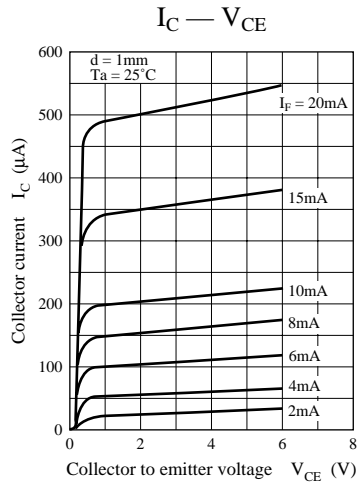
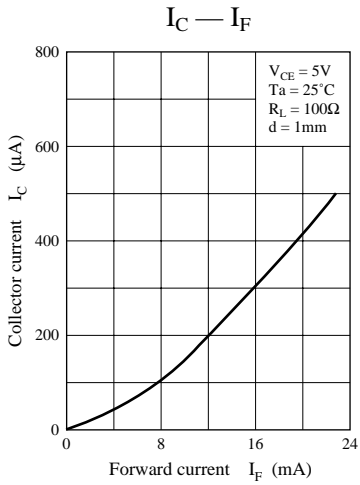
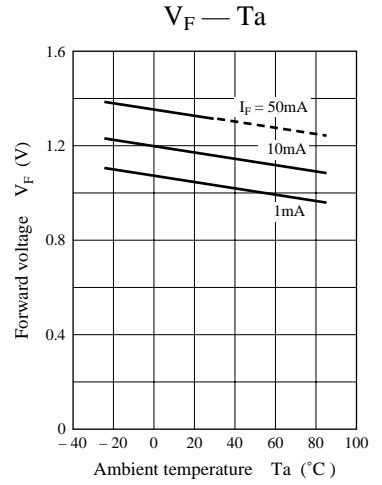
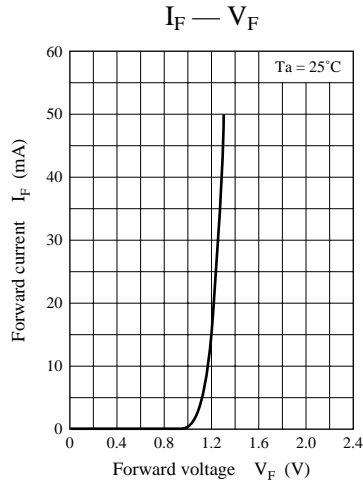
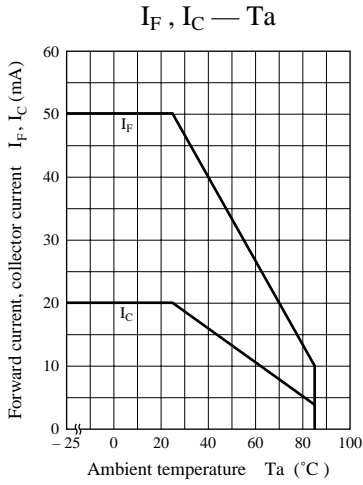
*1 Input power derating ratio is 1.0 mW/°C at Ta ≥ 25°C.

*2 Output power derating ratio is 0.67 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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