

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)

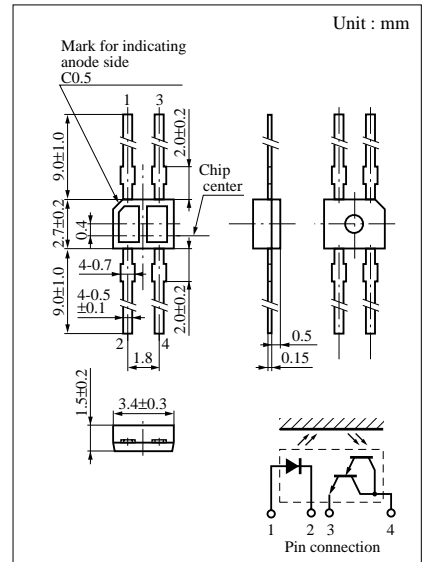
| Parameter | | Symbol | Conditions | min | typ | max | Unit |
|--------------------------|---|----------------------|---|------|------|------|---------------|
| Input characteristics | Forward voltage (DC) | V_F | $I_F = 50\text{mA}$ | | 1.3 | 1.5 | V |
| | Reverse current (DC) | I_R | $V_R = 3\text{V}$ | | 0.01 | 10 | μA |
| | 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 | μA |
| 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 | μA |
| | Response time | t_r^{*3}, t_f^{*4} | $V_{CC} = 10\text{V}, I_C = 1\text{mA}, R_L = 100\Omega$ | | 150 | | μs |
| | 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

