# CNB1001, CNB1002

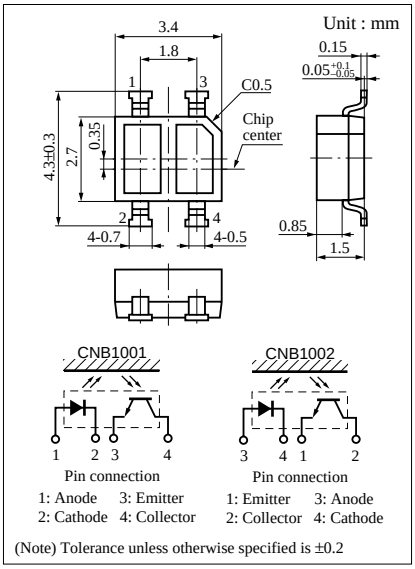
## Reflective Photosensors

### ■ Overview

CNB1001 and CNB1002 are a small, thin SMD-compatible 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

- Reflow-compatible reflective photosensor
- Ultraminiature, thin type : 2.7 × 3.4 mm (height : 1.5 mm)
- Visible light cutoff resin is used




### ■ Absolute Maximum Ratings (Ta = 25˚C)

| Parameter | | Symbol | Ratings | Unit |
|---|---|---|---|---|
| Input (Light emitting diode) | Reverse voltage (DC) | $V_R$ | 6 | 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 | $V_{CEO}$ | 35 | V |
| | Emitter to collector voltage | $V_{ECO}$ | 6 | V |
| | Collector power dissipation | $P_C$ *2 | 75 | mW |
| Temperature | Operating ambient temperature | $T_{opr}$ | –25 to +85 | ˚C |
| | Storage temperature | $T_{stg}$ | – 40 to +100 | ˚C |

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

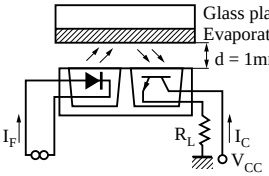
*2 Output power derating ratio is 1.0 mW/˚C at Ta ≥ 25˚C.

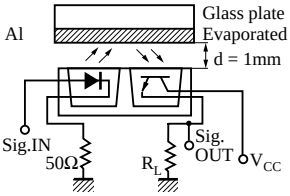
### ■ Electrical Characteristics (Ta = 25˚C)

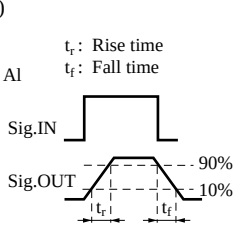
| Parameter | | Symbol | Conditions | min | typ | max | Unit |
|---|---|---|---|---|---|---|---|
| Input characteristics | Forward voltage (DC) | $V_F$ | $I_F$ = 20mA | | 1.2 | 1.4 | V |
| | Reverse current (DC) | $I_R$ | $V_R$ = 3V | | | 10 | µA |
| Output characteristics | Collector cutoff current | $I_{CEO}$ | $V_{CE}$ = 20V | | | 100 | nA |
| Transfer characteristics | Collector current | $I_C$ *1 | $V_{CC}$ = 2V, $I_F$ = 4mA. $R_L$ = 100Ω, d = 1mm | 23 | | 160 | µA |
| | Leakage current | $I_D$ | $V_{CC}$ = 2V, $I_F$ = 4mA, $R_L$ = 100Ω | | | 100 | nA |
| | Collector to emitter saturation voltage | $V_{CE(sat)}$ | $I_F$ = 20mA, $I_C$ = 0.1mA | | | 0.4 | V |
| | Response time | $t_r$ *2 | $V_{CC}$ = 5V, $I_C$ = 0.1mA, | | 30 | | µs |
| | | $t_f$ *2 | $R_L$ = 1000Ω | | 40 | | |

*1 Output Current (IC) measurement method (see figure below.)

*2 Response time measurement circuit (see figure below.)



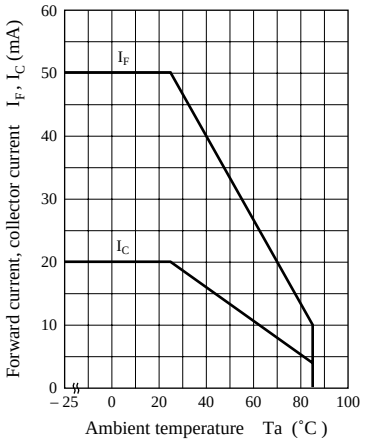

Color indication of classifications

| Class | $I_C$ (µA) | Color |
|---|---|---|
| Q | 23 to 50 | Orange |
| R | 41 to 90 | White |
| S | 74 to 160 | Light blue |

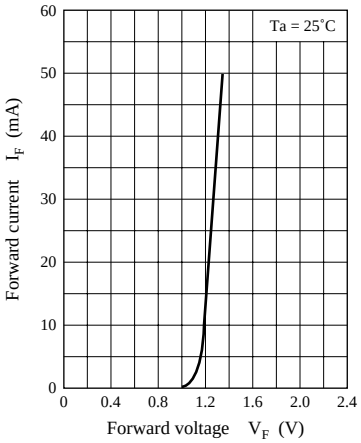
Input and output are handled electrically.

This product is not designed to withstand radiation.

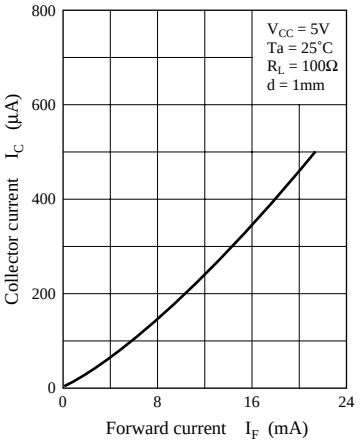
$I_F$ , $I_C$ — Ta



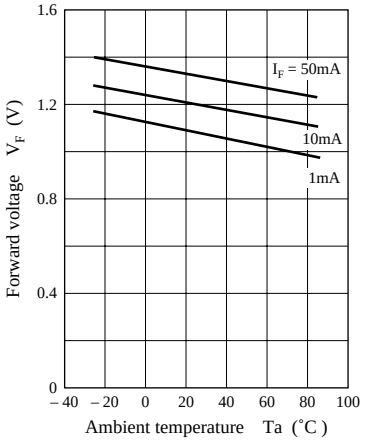

$I_F$ — $V_F$



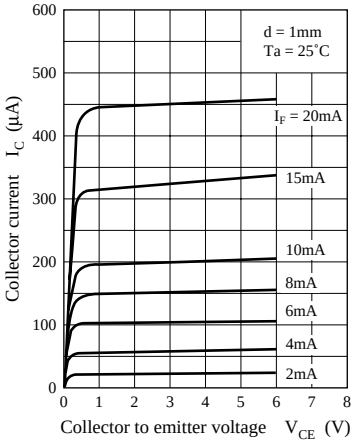

$I_C$ — $I_F$



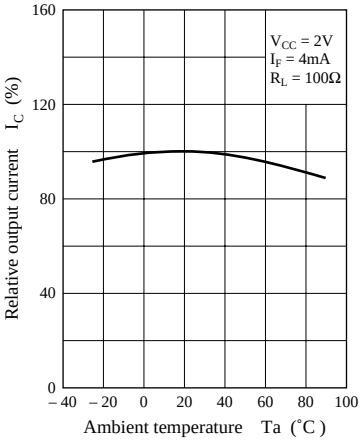

$V_F$ — Ta



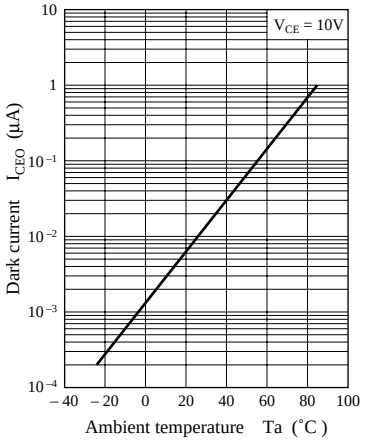

$I_C$ — $V_{CE}$



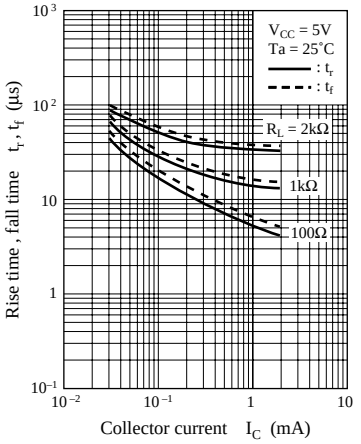

$I_C$ — Ta



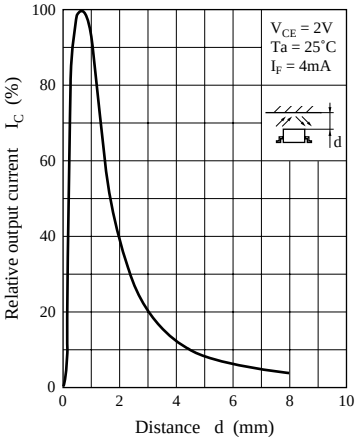

$I_{CEO}$ — Ta




$t_r$ , $t_f$ — $I_C$




$I_C$ — d



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