

CNB1303

Reflective Photosensor

Overview

CNB1303 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 ($T_a = 25^\circ\text{C}$)

	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	$^\circ\text{C}$
	Storage temperature	T_{stg}	-30 to +100	$^\circ\text{C}$

Electrical Characteristics ($T_a = 25^\circ\text{C}$)

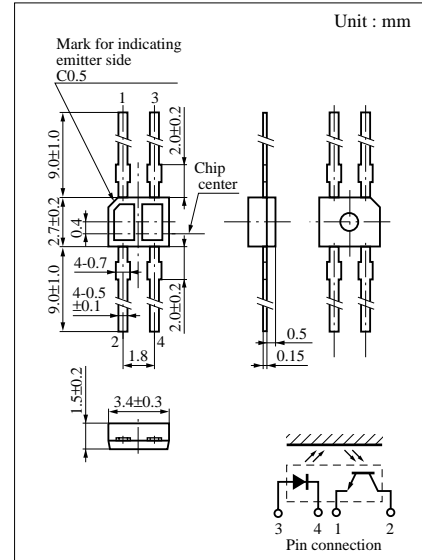
	Parameter	Symbol	Conditions	min	typ	max	Unit
Input characteristics	Forward voltage (DC)	V_F	$I_F = 50\text{mA}$		1.3	1.5	V
	Reverse current (DC)	I_R	$V_R = 3\text{V}$		0.01	10	μA
	Capacitance between terminals	C_t	$V_R = 0\text{V}, f = 1\text{MHz}$		30		pF
Output characteristics	Collector cutoff current	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/ $^\circ\text{C}$ at $T_a \geq 25^\circ\text{C}$.

*2 Output power derating ratio is 0.67 mW/ $^\circ\text{C}$ at $T_a \geq 25^\circ\text{C}$.

*2 Output current measurement method

