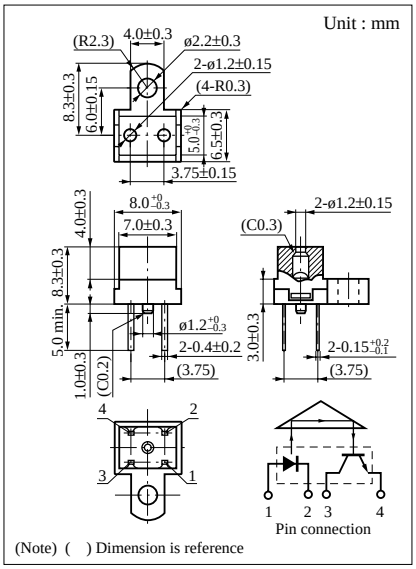
CNB1304

Reflective Photosensor



Tape end sensor for DAT

■ Overview

CNB1304 is a sensor which consists of a high efficiency GaAs infrared light emitting diode and a high sensitivity Si phototransistor which are arranged together in the same direction. It detects the beginning and end of a tape based on changes in the amount of light reflected from a prism which is situated outside of the sensor.

■ Features

- Fast response
- Small size and light weight

■ 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
	Collector power dissipation	P_C *2	100	mW
Temperature	Operating ambient temperature	T_{opr}	–25 to +85	˚C
	Storage temperature	T_{stg}	–30 to +100	˚C

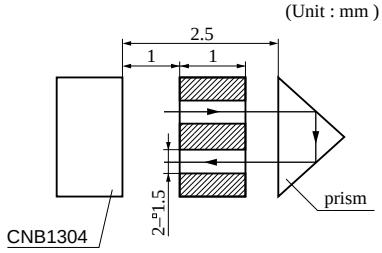
*1 Input power derating ratio is 1.0 mW/˚C at Ta ≥ 25˚C.

*2 Output power derating ratio is 1.34 mW/˚C at Ta ≥ 25˚C.

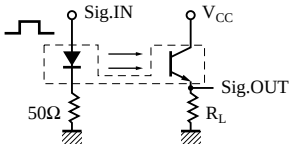
■ Electrical Characteristics (Ta = 25˚C)

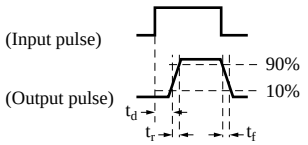
Parameter		Symbol	Conditions	min	typ	max	Unit
Input characteristics	Forward voltage (DC)	V_F	I_F = 50mA			1.5	V
	Reverse current (DC)	I_R	V_R = 3V			10	µA
Output characteristics	Collector cutoff current	I_{CEO}	V_{CE} = 10V			0.2	µA
Transfer characteristics	Collector current	I_C *1	V_{CE} = 5V, I_F = 20mA, R_L = 100Ω	30			µA
	Response time	t_r , t_f *2	V_{CC} = 10V, I_C = 0.5mA, R_L = 100Ω		6		µs
	Collector to emitter saturation voltage	$V_{CE(sat)}$	I_F = 50mA, I_C = 0.1mA			0.5	V

*1 I_C Measurement method



*2 Switching time measurement circuit





t_d : Delay time

t_r : Rise time (Time required for the collector current to increase from 10% to 90% of its final value)

t_f : Fall time (Time required for the collector current to decrease from 90% to 10% of its initial value)