

CNZ1002

Photo Interrupter

For contactless SW, object detection

Overview

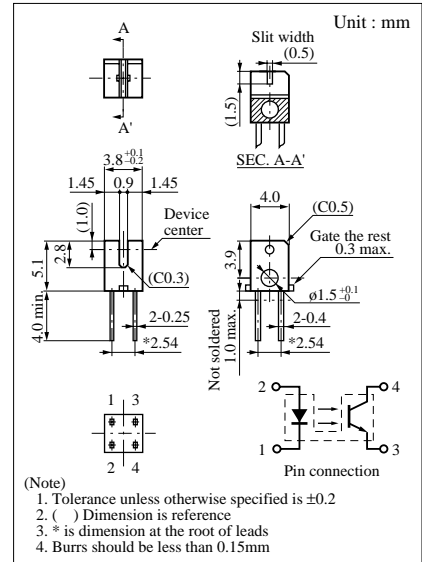
CNZ1002 is an ultraminiature, highly reliable transmissive photosensor in which a high efficiency GaAs infrared light emitting diode chip and a high sensitivity Si phototransistor chip are integrated in a double molded resin package.

Features

- Ultraminiature : 4.0 × 3.8 mm (height : 5.1 mm)
- Fast response : $t_r, t_f = 35 \mu s$ (typ.)
- Highly precise position detection : 0.25 mm
- Gap width : 0.9 mm

Absolute Maximum Ratings (Ta = 25°C)

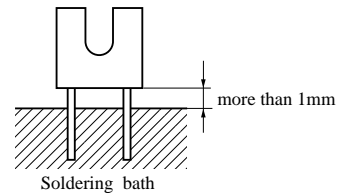
	Parameter	Symbol	Ratings	Unit
Input (Light emitting diode)	Reverse voltage (DC)	V_R	6	V
	Forward current (DC)	I_F	50	mA
	Power dissipation	P_D^{*1}	75	mW
Output (Photo transistor)	Collector current	I_C	20	mA
	Collector to emitter voltage	V_{CEO}	35	V
	Emitter to collector voltage	V_{ECO}	6	V
Temperature	Collector power dissipation	P_C^{*2}	75	mW
	Operating ambient temperature	T_{opr}	-25 to +85	°C
	Storage temperature	T_{stg}	-40 to +100	°C
	Soldering temperature	T_{sol}^{*3}	260	°C



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

^{*2} Output power derating ratio is 1.0mW/°C at Ta ≥ 25°C.

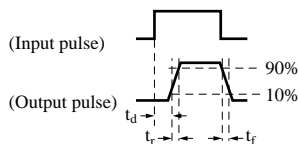
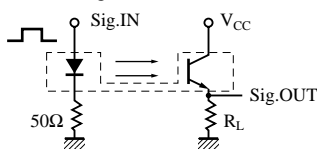
^{*3} Soldering time is within 5 seconds.



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	$V_{CE} = 5V, I_F = 1.5mA$	65		480	μA
	Collector to emitter saturation voltage	$V_{CE(sat)}$	$I_F = 3mA, I_C = 30\mu A$			0.4	V
	Response time	t_r, t_f^*	$V_{CC} = 5V, I_C = 0.1mA, R_L = 1000\Omega$		35		μs

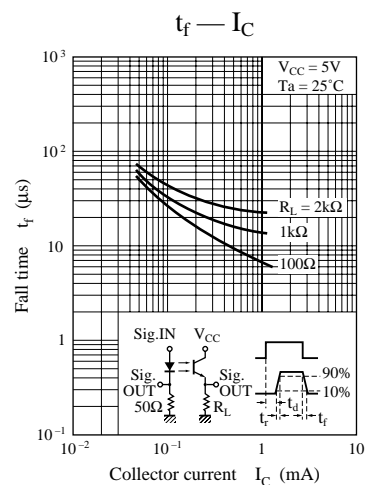
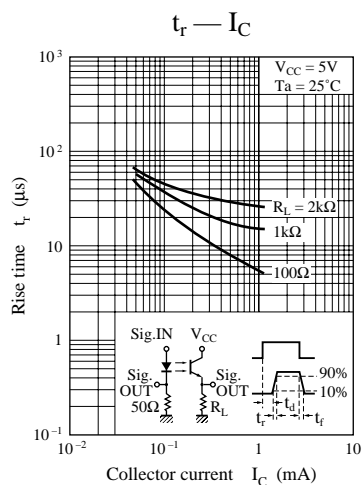
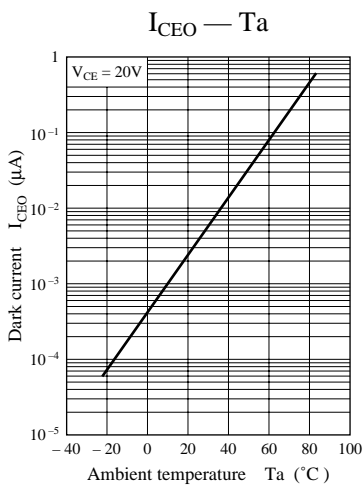
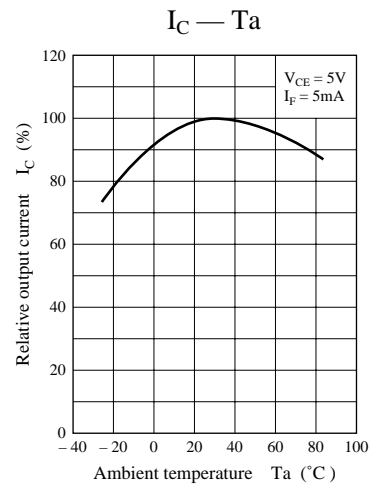
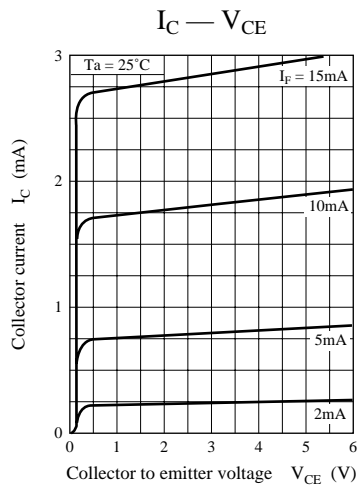
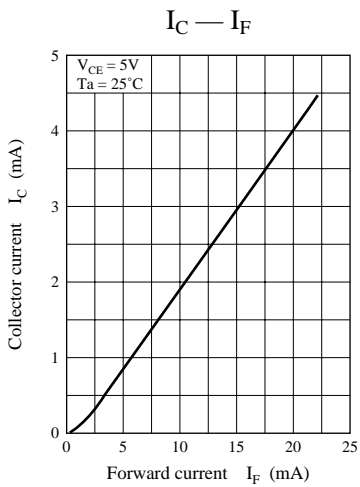
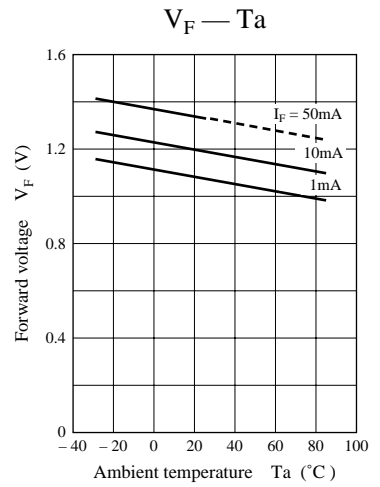
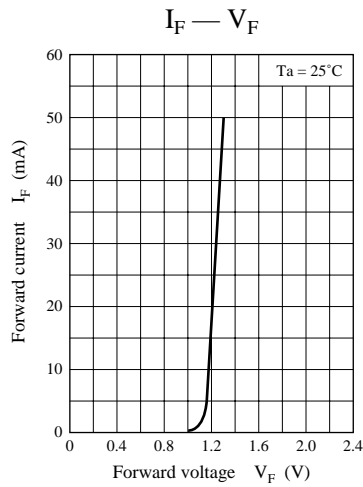
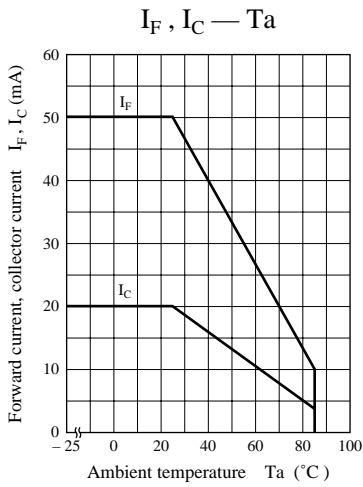
* Switching time measurement circuit



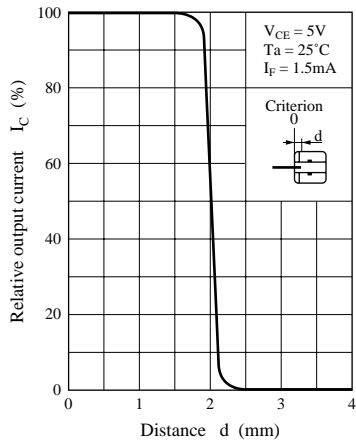
t_d : Delay time

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)



$I_C - d$ (1)



$I_C - d$ (2)

