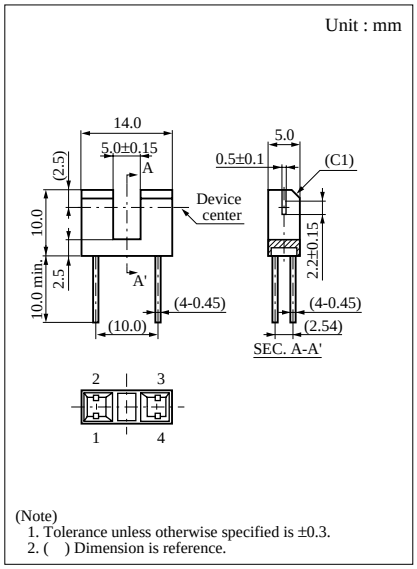
CNA1015

Photo Interrupters



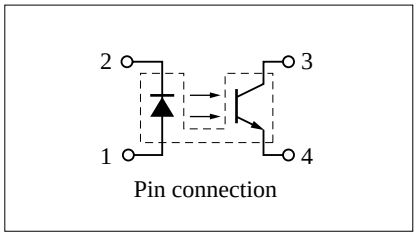
Overview

CNA1015 series is a transmissive photosensor series in which a high efficiency GaAs infrared light emitting diode is used as the light emitting element, and a high sensitivity phototransistor is used as the light detecting element. The two elements are arranged so as to face each other, and objects passing between them are detected.

Features

- Position detection accuracy : 0.3 mm
- Gap width : 5 mm
- The type directly attached to PCB

Internal connector



Absolute Maximum Ratings (Ta = 25˚C)

Parameter		Symbol	Ratings	Unit
Input (Light emitting diode)	Reverse voltage (DC)	V_R	5	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}	–40 to +100	˚C

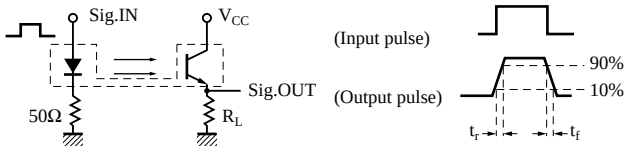
*1 Input power derating ratio is 1.0 mW/˚C at Ta = 25˚C.

*2 Output power derating ratio is 1.33 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		1.25	1.4	V
	Reverse current (DC)	I_R	V_R = 3V			10	µA
Output characteristics	Collector cutoff current	I_{CEO}	V_{CE} = 10V		10	200	nA
Transfer characteristics	Collector current	I_C	V_{CC} = 5V, I_F = 20mA, R_L = 100Ω	0.5		10	mA
	Collector to emitter saturation voltage	$V_{CE(sat)}$	I_F = 40mA, I_C = 1mA			0.4	V
	Response time	t_r , t_f *	V_{CC} = 5V, I_C = 1mA, R_L = 100Ω		5		µs

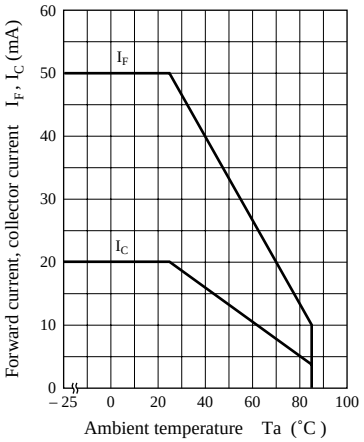
* Switching time measurement circuit



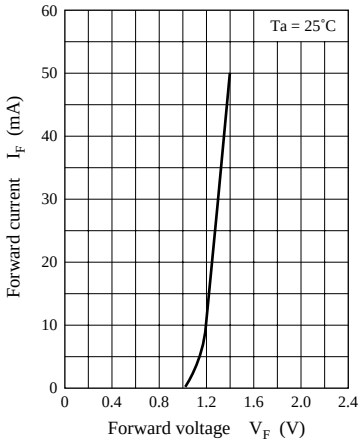
t_r : Rise time (Time required for the collector photo current to increase from 10% to 90% of its final value)

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

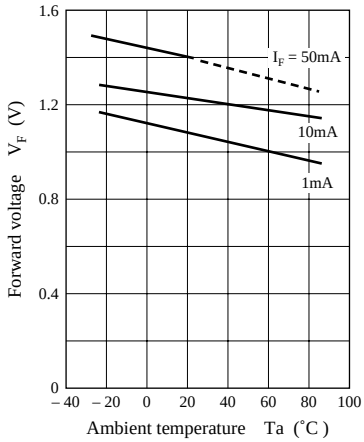
I_F , I_C — Ta



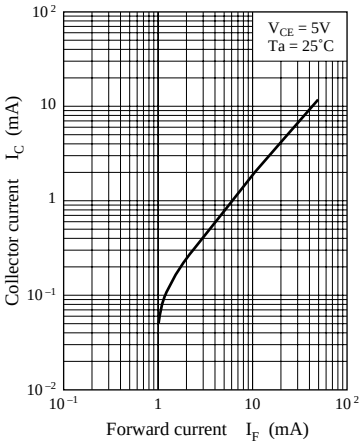
I_F — V_F



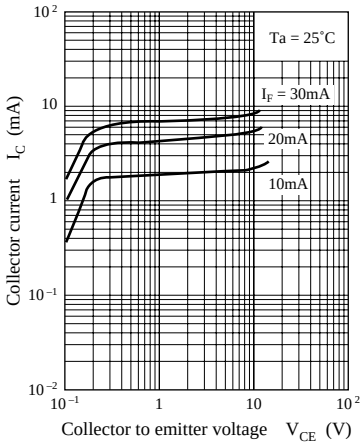
V_F — Ta



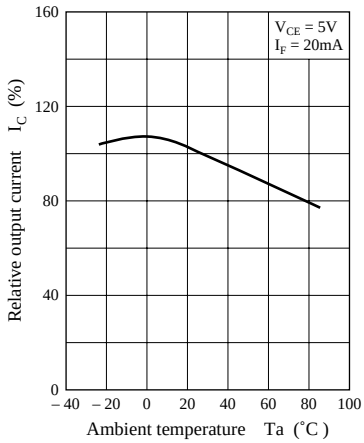
I_C — I_F



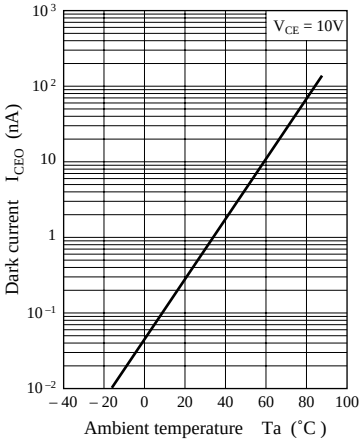
I_C — V_{CE}



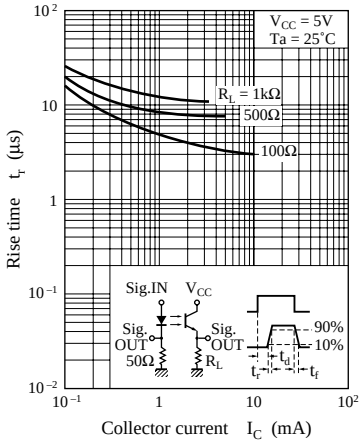
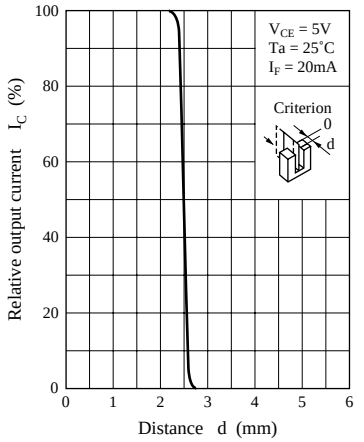
I_C — Ta



I_{CEO} — Ta



t_r — I_C



I_C — d