

CNA1312K

Photo Interrupter

For contactless SW, object detection

Overview

CNA1312K 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 : 2.6 × 4.9 mm (height : 3.3 mm)
- Highly precise position detection : 0.1 mm
- Gap width : 2.0 mm

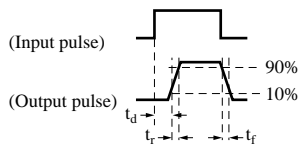
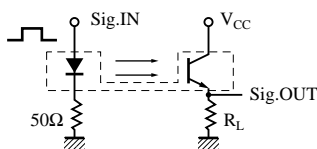
Absolute Maximum Ratings (Ta = 25°C)

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

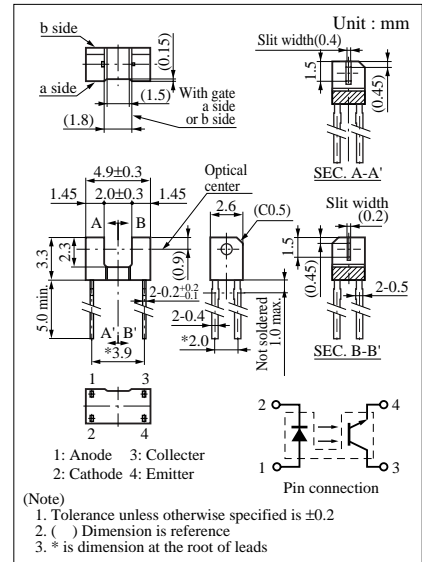
Electrical Characteristics (Ta = 25°C)

Parameter		Symbol	Conditions	min	typ	max	Unit
Input characteristics	Forward voltage (DC)	V_F	$I_F = 20\text{mA}$		1.2	1.4	V
	Reverse current (DC)	I_R	$V_R = 3\text{V}$			10	μA
Output characteristics	Collector cutoff current	I_{CEO}	$V_{CE} = 20\text{V}$			100	nA
Transfer characteristics	Collector current	I_C	$V_{CE} = 5\text{V}, I_F = 5\text{mA}$	40		400	μA
	Collector to emitter saturation voltage	$V_{CE(sat)}$	$I_F = 10\text{mA}, I_C = 40\mu\text{A}$			0.4	V
	Response time	t_r, t_f^{*}	$V_{CC} = 5\text{V}, I_C = 0.1\text{mA}, R_L = 1000\Omega$		50		μs

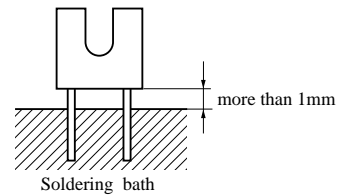
* Switching time measurement circuit

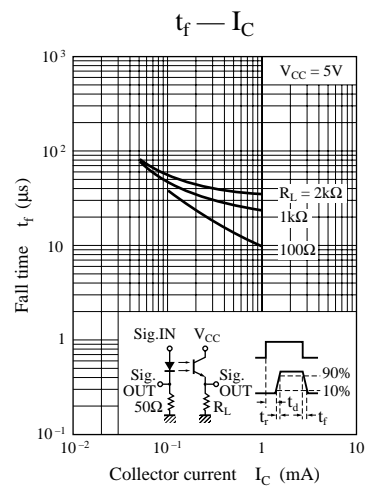
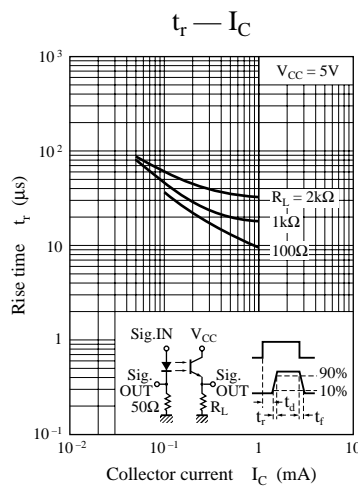
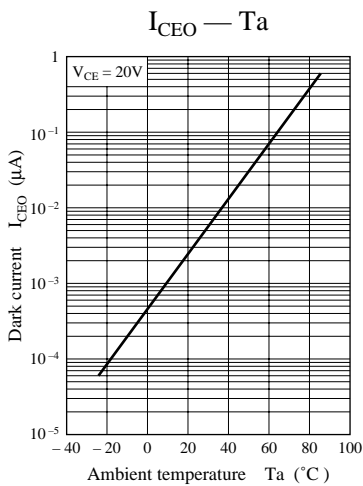
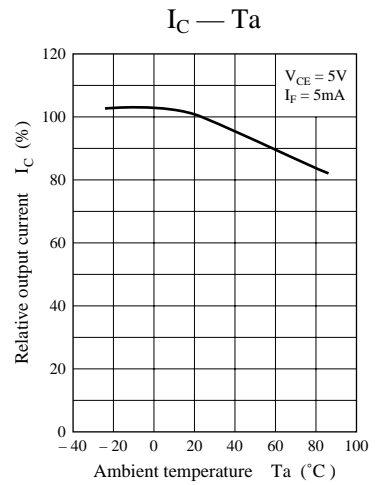
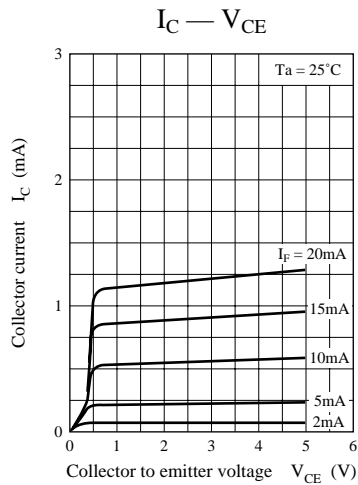
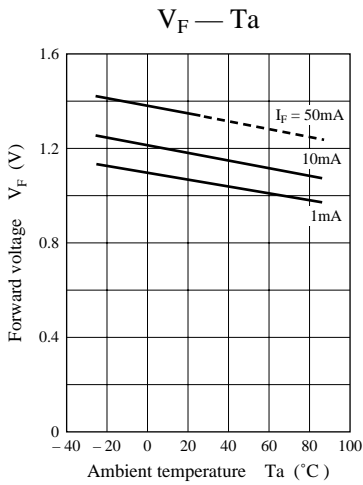
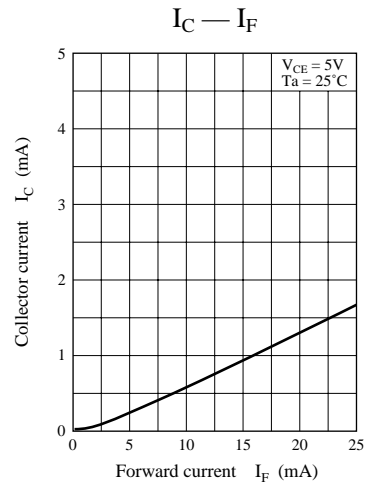
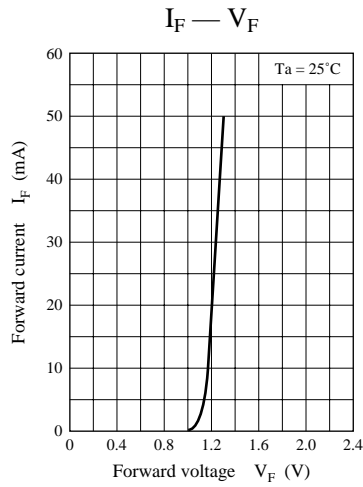
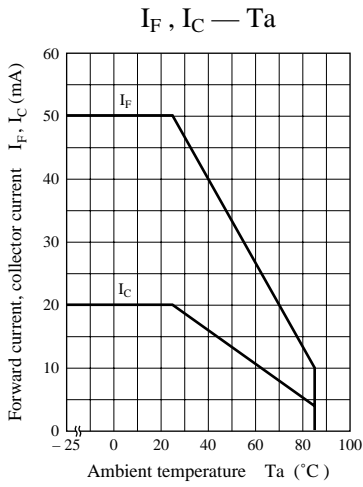


t_d : Delay time
 t_r : Rise time (Time required for the collector current to increase from 10% to 90% of its final value)
 t_f : Fall time (Time required for the collector current to decrease from 90% to 10% of its initial value)

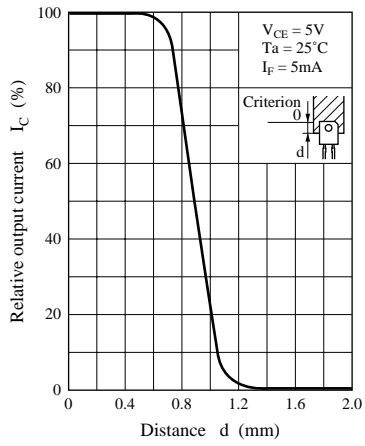


- *1 Input power derating ratio is 1.0 mW/°C at Ta ≥ 25°C.
- *2 Output power derating ratio is 1.0 mW/°C at Ta ≥ 25°C.
- *3 Soldering time is within 5 seconds.

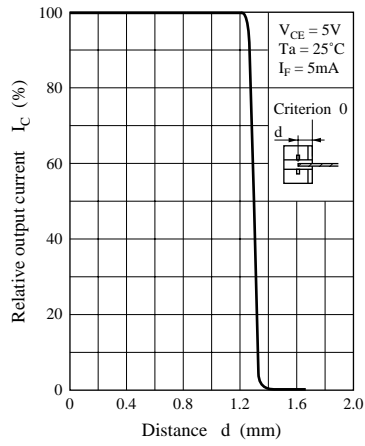




$I_C - d (1)$



$I_C - d (2)$



Caution for Safety

 **DANGER**

Gallium arsenide material (GaAs) is used in this product.

Therefore, do not burn, destroy, cut, crush, or chemically decompose the product, since gallium arsenide material in powder or vapor form is harmful to human health.

Observe the relevant laws and regulations when disposing of the products. Do not mix them with ordinary industrial waste or household refuse when disposing of GaAs-containing products.

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