

# CNA1311K

## Photo Interrupter

For contactless SW, object detection

### Overview

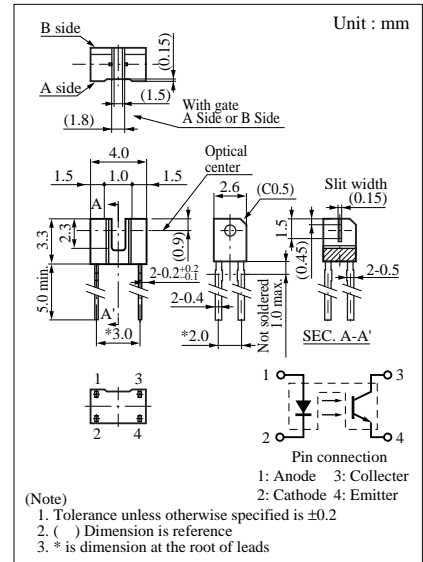
CNA1311K is an ultraminiature, highly reliable transmissive photosensor in which a high efficiency GaAs infrared light emitting diode chip and a high sensitivity Si phototransistor chip are integrated in a double molded resin package.

### Features

- Ultraminiature : 2.6 × 4.0 mm (height : 3.3 mm)
- Highly precise position detection : 0.05 mm
- Gap width : 1.0 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



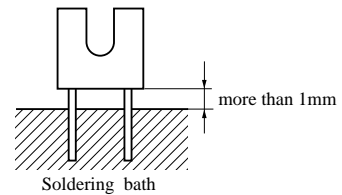
\*1 Input power derating ratio is

1.0W/°C at  $T_a \geq 25^\circ\text{C}$ .

\*2 Output power derating ratio is

1.0mW/°C at  $T_a \geq 25^\circ\text{C}$ .

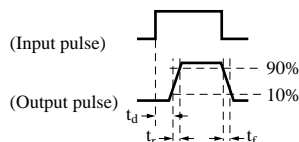
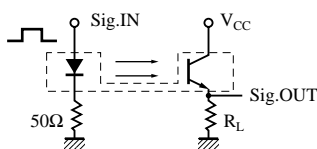
\*3 Soldering time is within 5 seconds.



### Electrical Characteristics (Ta = 25°C)

Parameter		Symbol	Conditions	min	typ	max	Unit
Input characteristics	Forward voltage (DC)	$V_F$	$I_F = 20\text{mA}$		1.2	1.4	V
	Reverse current (DC)	$I_R$	$V_R = 3\text{V}$			10	$\mu\text{A}$
Output characteristics	Collector cutoff current	$I_{CEO}$	$V_{CE} = 20\text{V}$			100	nA
Transfer characteristics	Collector current	$I_C$	$V_{CE} = 5\text{V}, I_F = 5\text{mA}$	50		600	$\mu\text{A}$
	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		$\mu\text{s}$

\* 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)

