

# CNC1S101, CNZ3132, CNZ3133, CNZ3134 (ON3131, ON3132, ON3133, ON3134)

## Optoisolators

### Overview

CNC1S101 is a DIL type 4-pin single-channel optoisolator which is housed in a small package. This optoisolator series also includes the two-channel CNZ3132, the three-channel CNZ3133, and the four-channel 3134.

The CNC1S101 series has a number of good features, including high I/O isolation voltage and current transfer ratio (CTR), as well as high speed response.

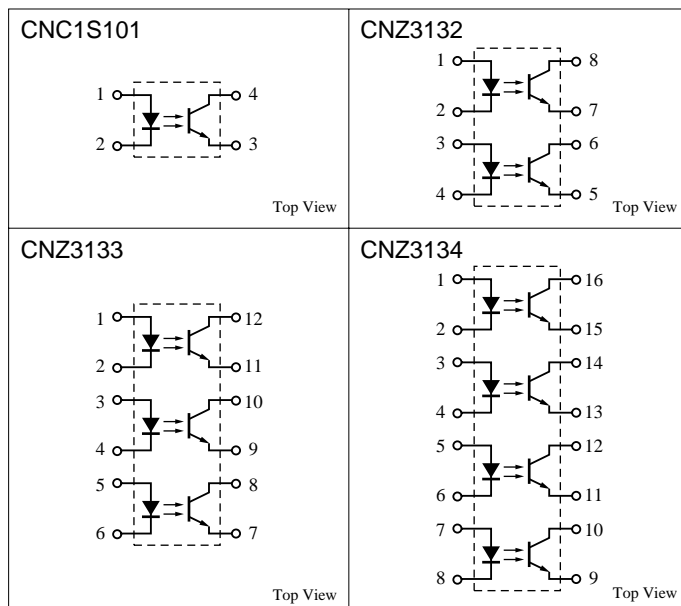
### Features

- High current transfer ratio :  $CTR \geq 100\%$
- High I/O isolation voltage :  $V_{ISO} = 5000 V_{rms}$  (min.)
- Fast response :  $t_r = 2 \mu s$ ,  $t_f = 3 \mu s$  (typ.)
- Low dark current :  $I_{CEO} \leq 100 nA$
- UL listed (UL File No. E79920)

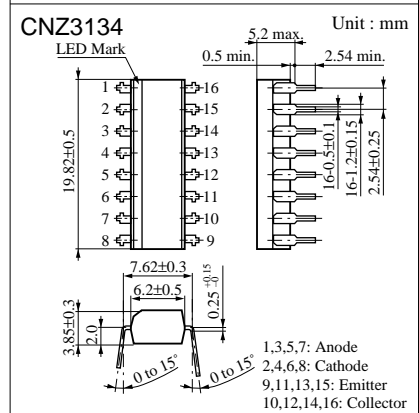
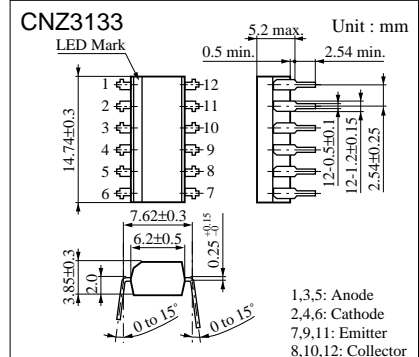
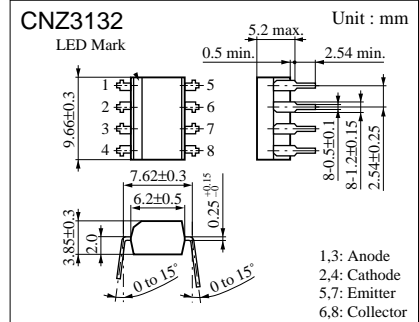
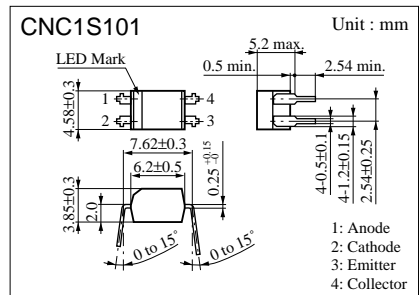
### Applications

- Switching power supply
- Computer terminal equipment
- System equipment, measuring equipment
- Telephones, copier, vending machines
- Televisions, VCRs, and other consumer electronics products
- Medical equipment and physical and chemical equipment
- Signal transmission between circuits with different potentials and impedances

### Pin Connection



Note) The part numbers in the parenthesis show conventional part number.



■ 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
	Pulse forward current	$I_{FP}^{*1}$	1	A
	Power dissipation	$P_D^{*2}$	75	mW
Output (Photo transistor)	Collector current	$I_C$	50	mA
	Collector to emitter voltage	$V_{CEO}$	80	V
	Emitter to collector voltage	$V_{ECO}$	7	V
Collector power dissipation		$P_C^{*3}$	150	mW
Total power dissipation		$P_T$	200	mW
Operating ambient temperature		$T_{opr}$	-30 to +100	°C
Storage temperature		$T_{stg}$	-55 to +125	°C

\*1 Pulse width ≤ 100 μs, repeat 100 pps

\*2 Input power derating ratio is 0.75 mW/°C at Ta ≥ 25°C.

\*3 Output power derating ratio is 1.5 mW/°C at Ta ≥ 25°C.

■ Electrical Characteristics (Ta = 25°C)

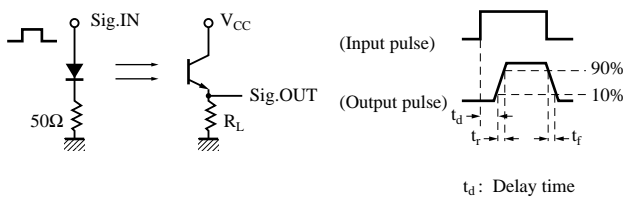
Parameter		Symbol	Conditions	min	typ	max	Unit
Input characteristics	Reverse current (DC)	$I_R$	$V_R = 3V$			10	μA
	Forward voltage (DC)	$V_F$	$I_F = 50mA$		1.35	1.5	V
	Capacitance between pins	$C_t$	$V_R = 0V, f = 1MHz$		15		pF
Output characteristics	Collector cutoff current	$I_{CEO}$	$V_{CE} = 20V$		5	100	nA
	Collector to emitter voltage	$V_{CEO}$	$I_C = 100\mu A$	80			V
	Collector to emitter capacitance	$C_C$	$V_{CE} = 10V, f = 1MHz$		3		pF
Transfer characteristics	Emitter to collector voltage	$V_{ECO}$	$I_E = 10\mu A$	7			V
	DC current transfer ratio	$CTR^{*1, *5}$	$V_{CE} = 5V, I_F = 5mA$	100		600	%
	Isolation voltage, input to output	$V_{ISO}$	$t = 1 min., RH < 60\%$	5000			$V_{rms}$
	Isolation capacitance, input to output	$C_{ISO}$	$f = 1MHz$		0.7		pF
	Isolation resistance, input to output	$R_{ISO}$	$V_{ISO} = 500V$	$10^{11}$			Ω
	Rise time	$t_r^{*2, *4}$	$V_{CC} = 10V, I_C = 2mA$		2		μs
	Fall time	$t_f^{*3, *4}$	$R_L = 100\Omega$		3		μs
Collector to emitter saturation voltage	$V_{CE(sat)}$	$I_F = 20mA, I_C = 1mA$		0.1	0.2	V	

\*1 DC current transfer ratio (CTR) is a ratio of output current against DC input current.

\*2  $t_r$  : Time required for the collector current to increase from 10% to 90% of its final value

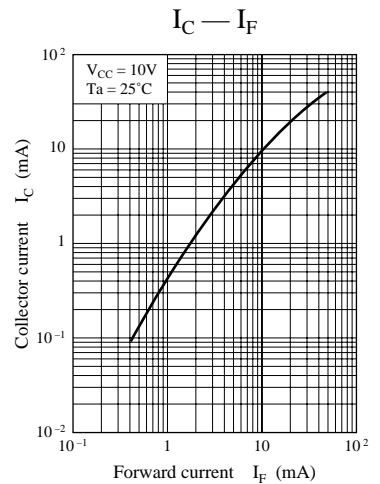
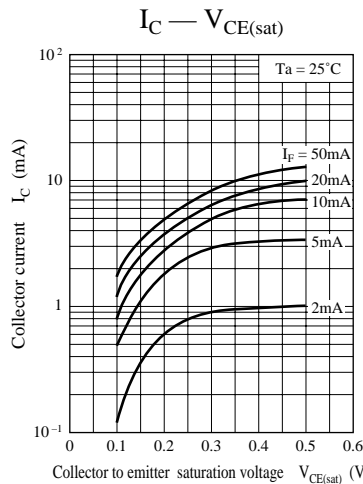
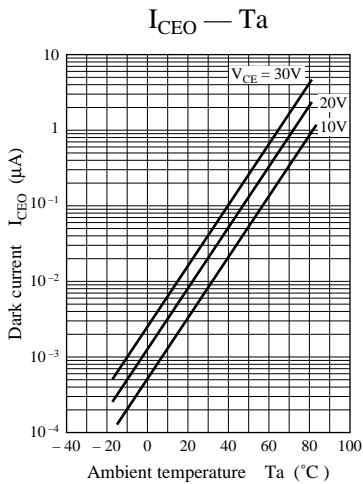
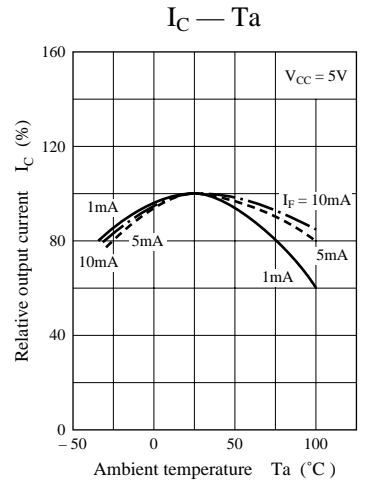
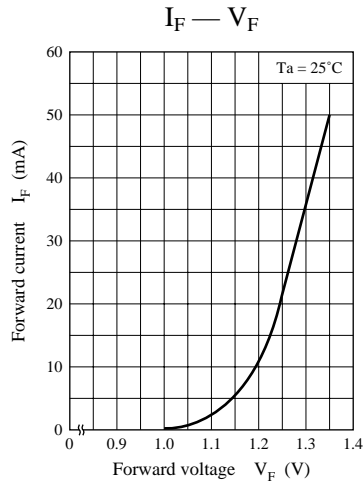
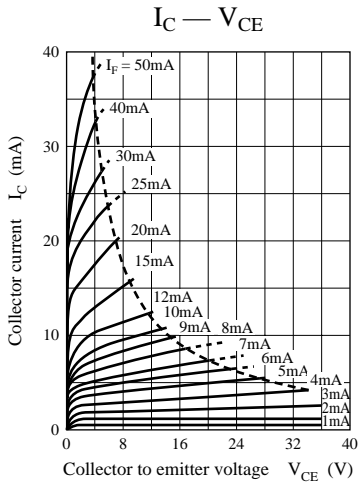
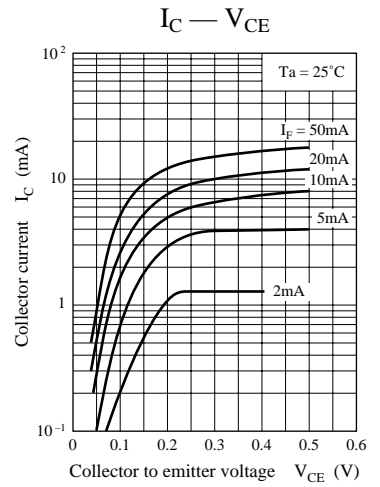
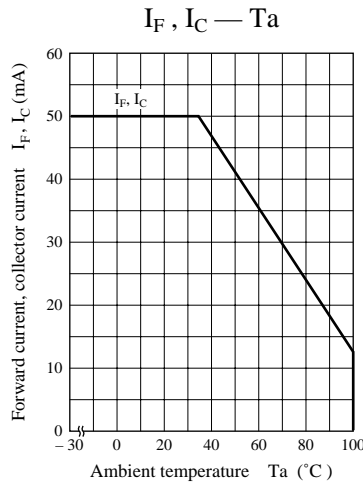
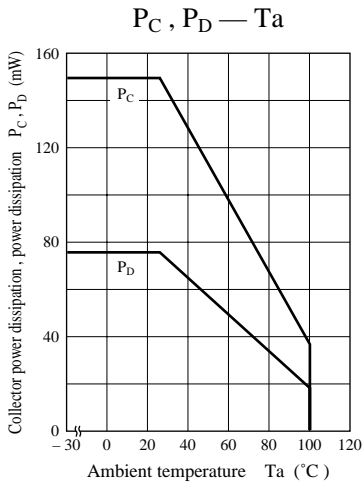
\*3  $t_f$  : Time required for the collector current to decrease from 90% to 10% of its initial value

\*4 Rise and fall time measurement circuit

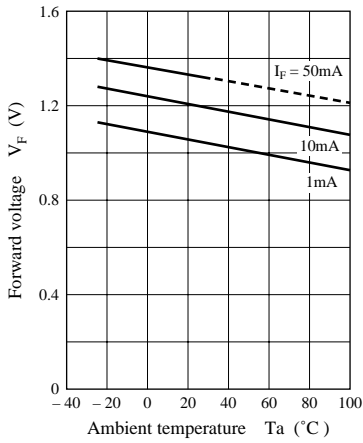


\*5 CTR classifications

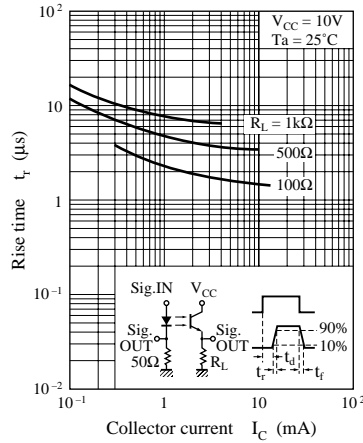
Class	General	R	S
CTR (%)	100 to 600	100 to 300	200 to 600



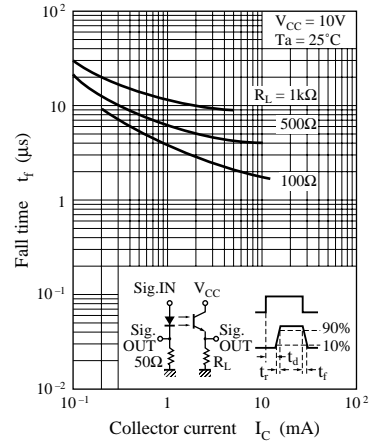
$V_F - T_a$



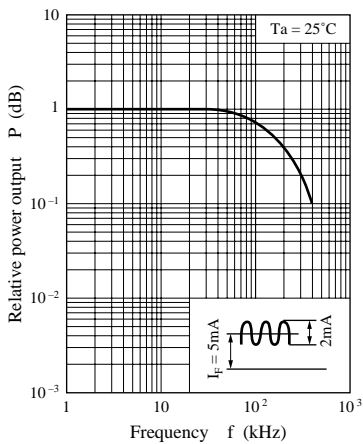
$t_r - I_C$



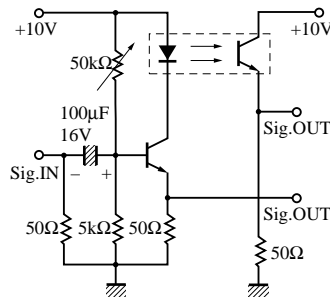
$t_f - I_C$



Frequency characteristics



Measurement circuit of frequency characteristics



# 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.

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