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Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

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CNC1S101 (ON3131), CNZ3132 (ON3132), CNZ3133 (ON3133), CNZ3134 (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.

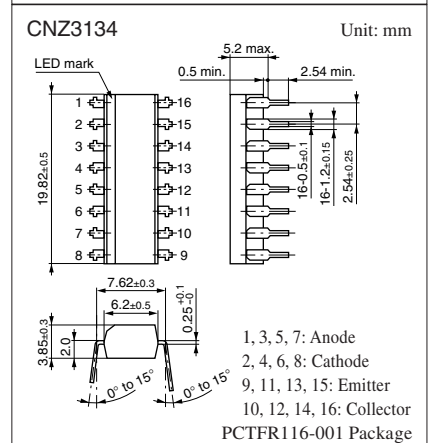
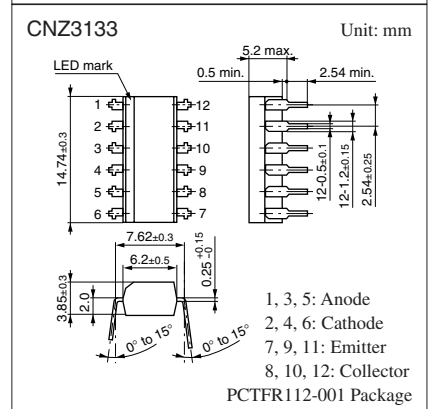
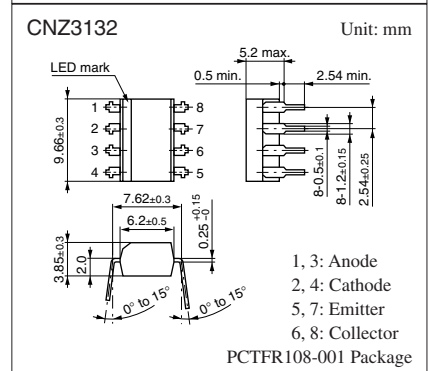
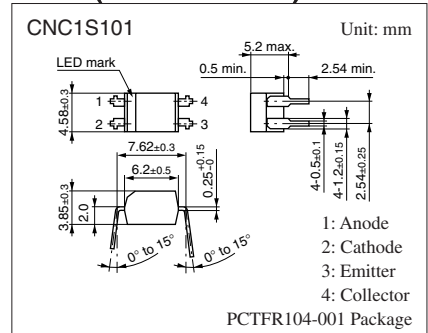
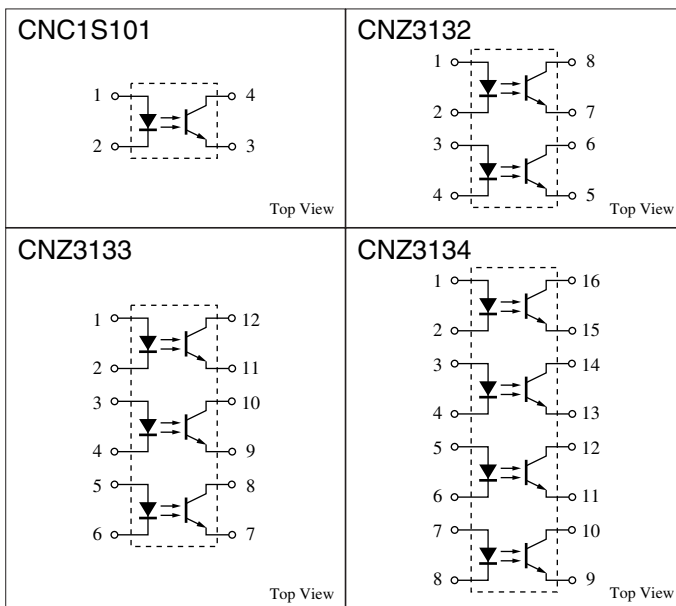
Features

- High current transfer ratio: CTR ≥ 100%
- High I/O isolation voltage: $V_{ISO} = 5\,000\text{ V[rms]}$ (min.)
- Fast response: $t_r = 2\ \mu\text{s}$, $t_f = 3\ \mu\text{s}$ (typ.)
- Collector-emitter cutoff current (Base open): $I_{CEO} \leq 100\ \text{nA}$
- 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 $T_a = 25^\circ\text{C}$

Parameter		Symbol	Rating	Unit
Input (Light emitting diode)	Reverse voltage	V_R	6	V
	Forward current	I_F	50	mA
	Pulse forward current *1	I_{FP}	1	A
	Power dissipation *2	P_D	75	mW
Output (Photo transistor)	Collector-emitter voltage (Base open)	V_{CEO}	80	V
	Emitter-collector voltage (Base open)	V_{ECO}	7	V
	Collector current	I_C	50	mA
	Collector power dissipation *3	P_C	150	mW
Isolation voltage, input to output *4		V_{ISO}	5 000	V[rms]
Total power dissipation		P_T	200	mW
Operating ambient temperature		T_{opr}	-30 to +100	$^\circ\text{C}$
Storage temperature		T_{stg}	-55 to +125	$^\circ\text{C}$

Note) *1: Pulse width $\leq 100 \mu\text{s}$, repeat 100 pps

*2: Input power derating ratio is
0.75 mW/ $^\circ\text{C}$ at $T_a \geq 25^\circ\text{C}$

*3: Output power derating ratio is
1.5 mW/ $^\circ\text{C}$ at $T_a \geq 25^\circ\text{C}$

*4: AC 1 min., RH < 60%

■ Electrical-Optical Characteristics $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Input characteristics	Forward voltage	V_F	$I_F = 50 \text{ mA}$		1.35	1.50	V
	Reverse current	I_R	$V_R = 3 \text{ V}$			10	μA
	Terminal capacitance	C_t	$V_R = 0 \text{ V}$, $f = 1 \text{ MHz}$		15		pF
Output characteristics	Collector-emitter voltage (Base open)	V_{CEO}	$I_C = 100 \mu\text{A}$	80			V
	Emitter-collector voltage (Base open)	V_{ECO}	$I_E = 10 \mu\text{A}$	7			V
	Collector-emitter cutoff current (Base open)	I_{CEO}	$V_{CE} = 20 \text{ V}$		5	100	nA
	Collector-emitter capacitance	C_C	$V_{CE} = 10 \text{ V}$, $f = 1 \text{ MHz}$		10		pF
Transfer characteristics	DC current transfer ratio *1	CNZ3132	$V_{CE} = 5 \text{ V}$, $I_F = 5 \text{ mA}$	100		600	%
		CNZ3133					
		CNZ3134					
		CNC1S101 *4					
	Isolation capacitance, input to output	C_{ISO}	$f = 1 \text{ MHz}$		0.7		pF
	Isolation resistance, input to output	R_{ISO}	$V_{ISO} = 500 \text{ V}$	10^{11}			Ω
	Rise time *2	t_r	$V_{CC} = 10 \text{ V}$, $I_C = 2 \text{ mA}$		2		μs
	Fall time *3	t_f	$R_L = 100 \Omega$		3		μs
Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_F = 20 \text{ mA}$, $I_C = 1 \text{ mA}$		0.1	0.2	V	

Note) 1. Input and output are handled electrically.

2. This product is not designed to withstand radiation

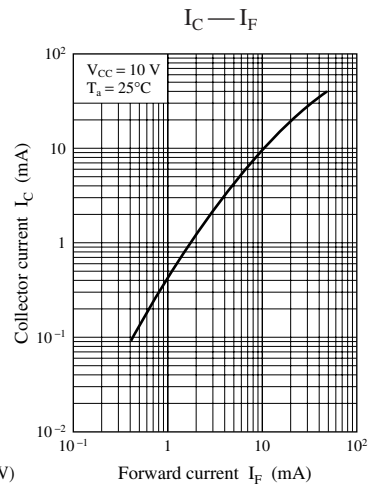
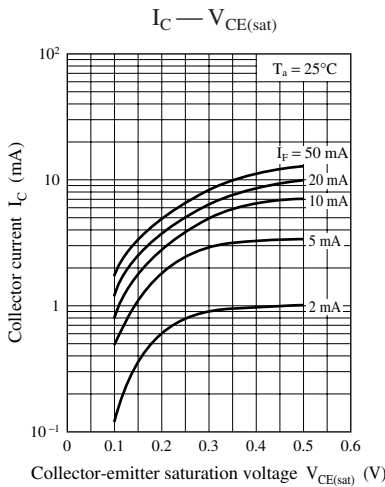
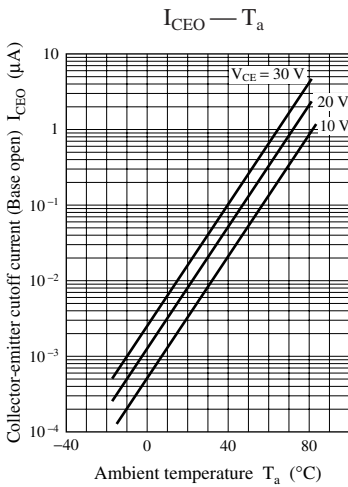
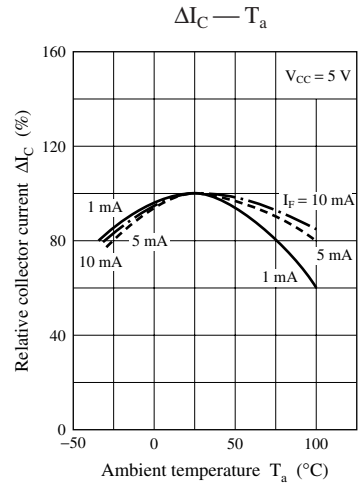
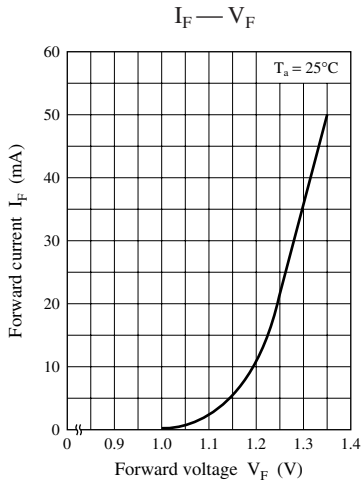
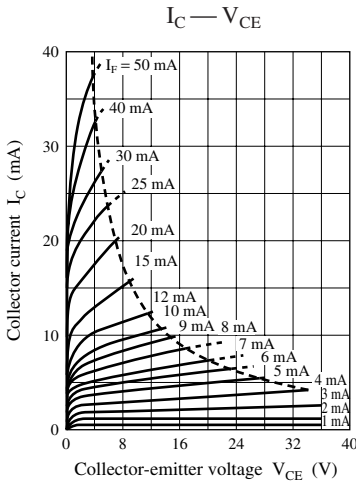
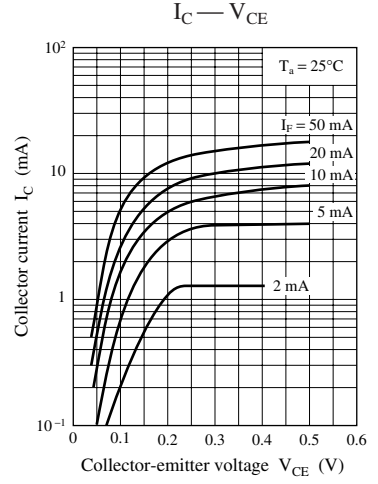
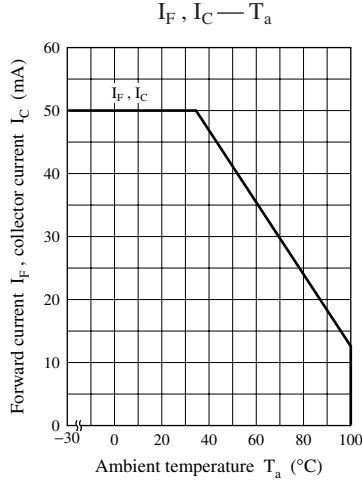
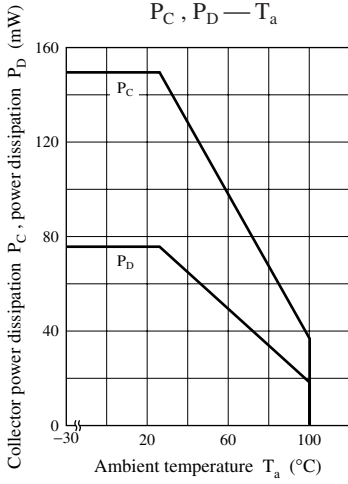
3. *1:
$$\text{CTR} = \frac{I_C}{I_F} \times 100\%$$

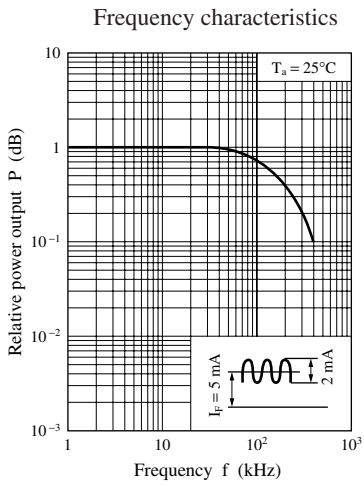
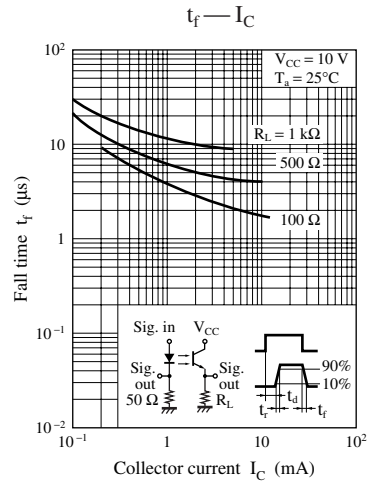
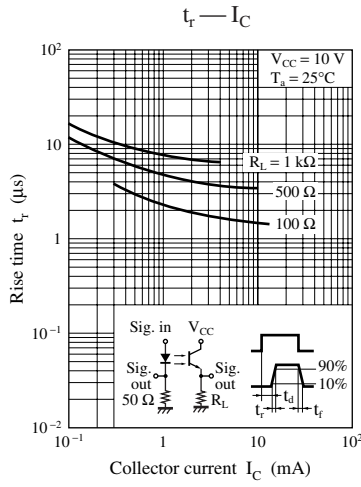
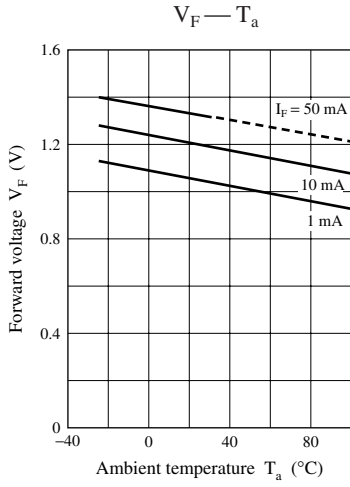
*2: t_r : Time required for the collector current to increase from 10% to 90% of its final value

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

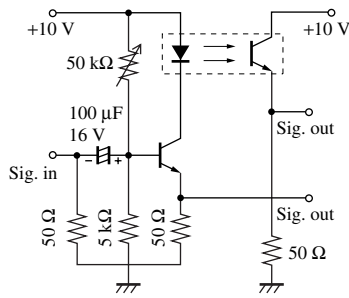
*4: Rank classification

Rank	R	S	V	No-rank
CTR (%)	100 to 300	200 to 600	80 to 130	100 to 600





Measurement circuit of frequency characteristics



Caution for Safety

 **DANGER**

■ This product contains Gallium Arsenide (GaAs).

GaAs powder and vapor are hazardous to human health if inhaled or ingested. Do not burn, destroy, cut, cleave off, or chemically dissolve the product. Follow related laws and ordinances for disposal. The product should be excluded from general industrial waste or household garbage.

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