

CNC1S101,CNZ3132,CNZ3133,CNZ3134

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.

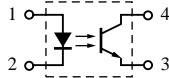
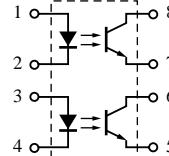
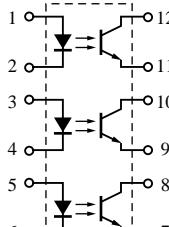
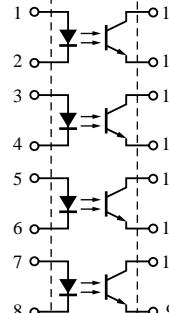
■ Features

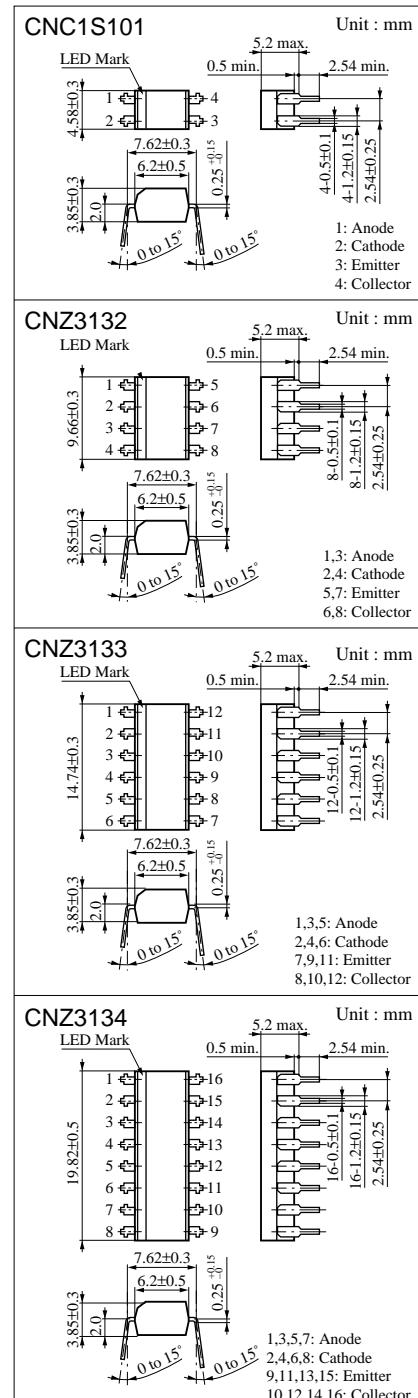
- High current transfer ratio : CTR $\geq 100\%$
- High I/O isolation voltage : $V_{ISO} = 5000 \text{ V}_{rms}$ (min.)
- Fast response : $t_r = 2 \mu\text{s}$, $t_f = 3 \mu\text{s}$ (typ.)
- Low dark current : $I_{CEO} \leq 100 \text{ nA}$
- UL listed (UL File No. E79920)

■ 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

CNC1S101	CNZ3132
	
Top View	Top View
CNZ3133	CNZ3134
	
Top View	Top View



■ Absolute Maximum Ratings ($T_a = 25^\circ\text{C}$)

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 $^\circ\text{C}$	
Storage temperature	T_{stg}	-55 to +125 $^\circ\text{C}$	

*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 $T_a \geq 25^\circ\text{C}$.

■ Electrical Characteristics ($T_a = 25^\circ\text{C}$)

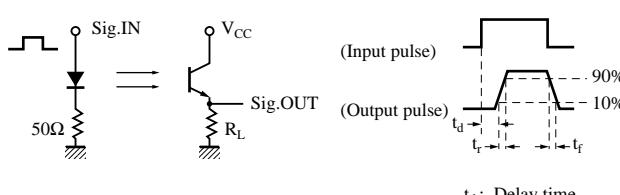
Parameter	Symbol	Conditions	min	typ	max	Unit
Input characteristics	Reverse current (DC)	I_R $V_R = 3\text{V}$			10	μA
	Forward voltage (DC)	V_F $I_F = 50\text{mA}$		1.35	1.5	V
	Capacitance between pins	C_t $V_R = 0\text{V}$, $f = 1\text{MHz}$		15		pF
Output characteristics	Collector cutoff current	I_{CEO}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

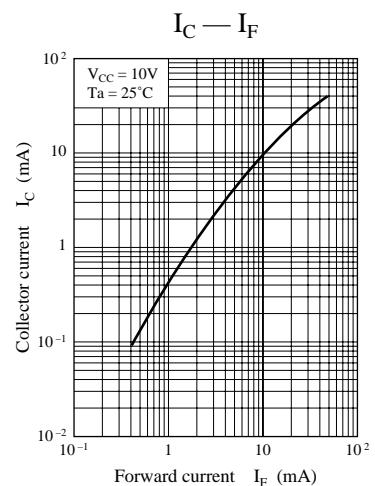
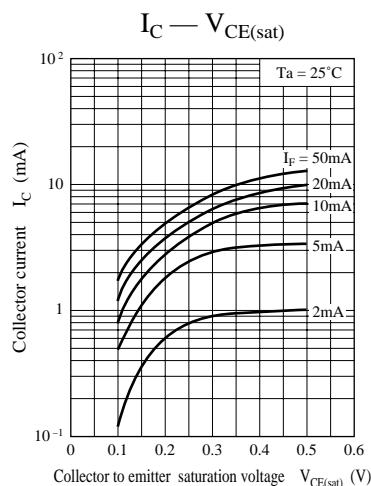
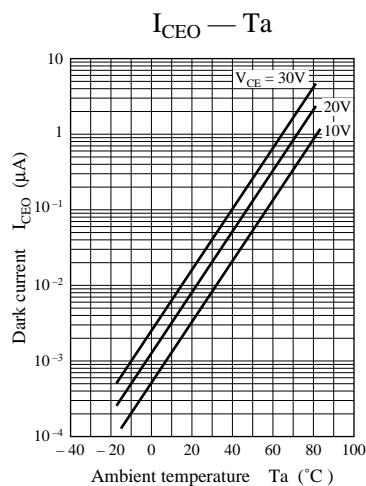
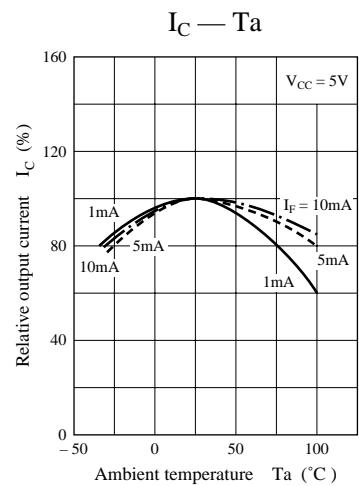
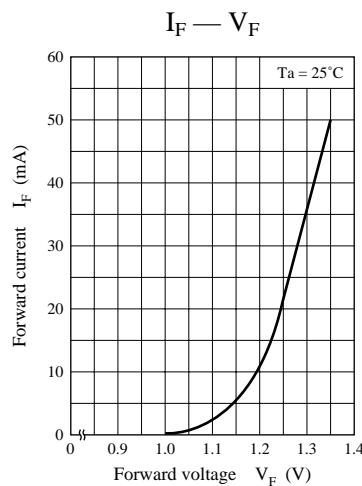
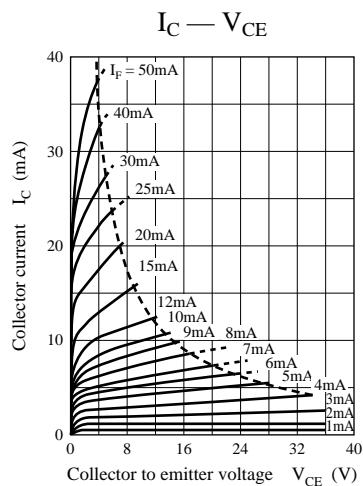
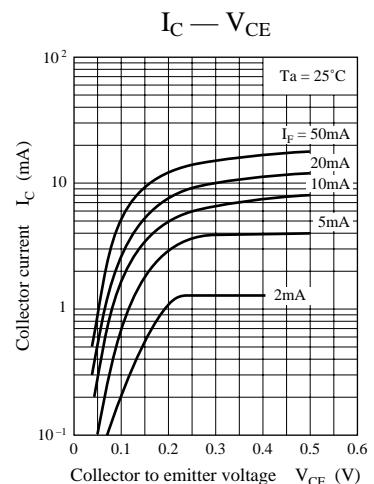
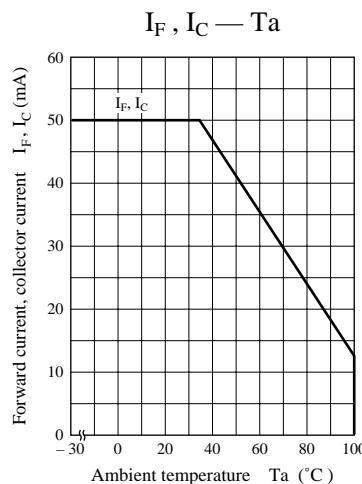
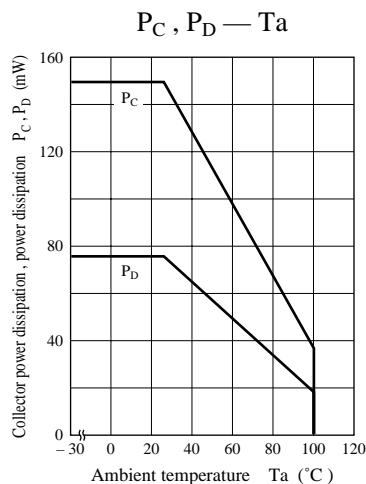
*4 Rise and fall time measurement circuit

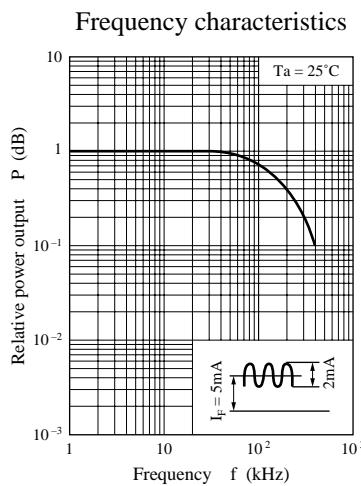
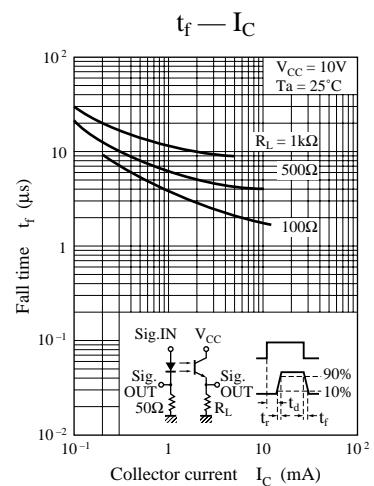
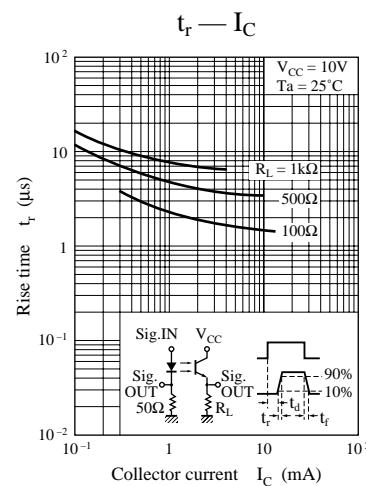
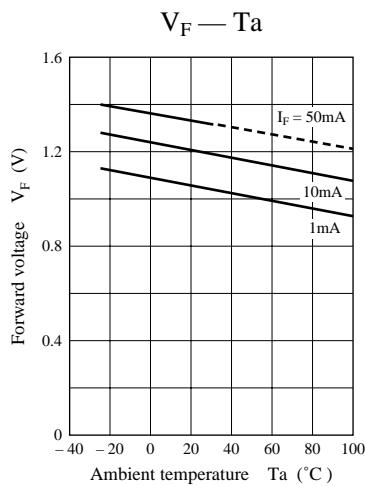


t_d : Delay time

*5 CTR classifications

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





Measurement circuit of frequency characteristics

