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

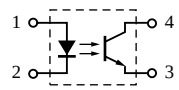
- High current transfer ratio : CTR ≥ 100%
- High I/O isolation voltage : V_{ISO} = 5000 V_{rms} (min.)
- Fast response : t_r = 2 µs, t_f = 3 µs (typ.)
- Low dark current : I_{CEO} ≤ 100 nA
- UL listed (UL File No. E79920)

■ 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 phsical and chemical equipment
- Signal transmission between circuits with different potentials and impedances

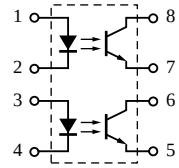
■ Pin Connection

CNC1S101



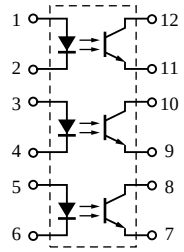
Top View

CNZ3132



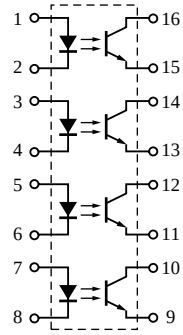
Top View

CNZ3133



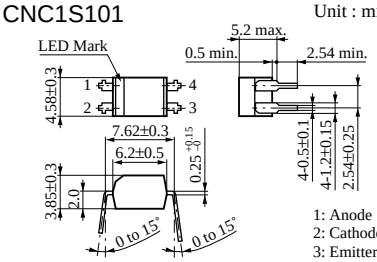
Top View

CNZ3134



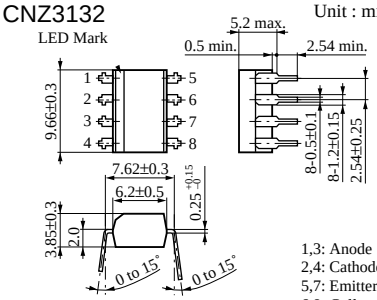
Top View

CNC1S101 Unit : mm



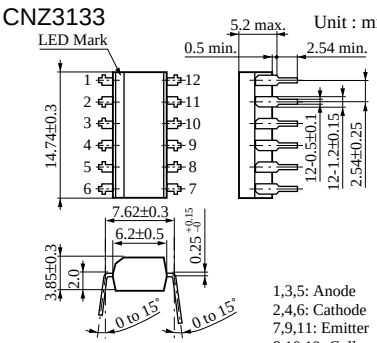
1: Anode
2: Cathode
3: Emitter
4: Collector

CNZ3132 Unit : mm



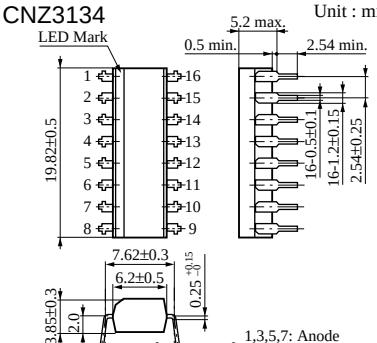
1,3: Anode
2,4: Cathode
5,7: Emitter
6,8: Collector

CNZ3133 Unit : mm



1,3,5: Anode
2,4,6: Cathode
7,9,11: Emitter
8,10,12: Collector

CNZ3134 Unit : mm



1,3,5,7: Anode
2,4,6,8: Cathode
9,11,13,15: Emitter
10,12,14,16: Collector

■ 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)

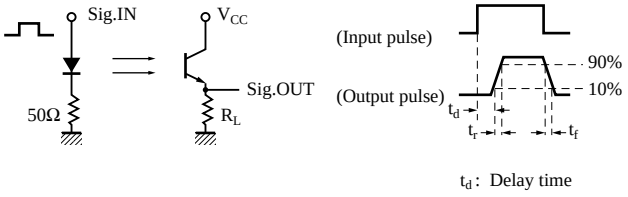
Parameter		Symbol	Conditions	min	typ	max	Unit
Input characteristics	Reverse current (DC)	I_R	V_R = 3V			10	µA
	Forward voltage (DC)	V_F	I_F = 50mA		1.35	1.5	V
	Capacitance between pins	C_t	V_R = 0V, f = 1MHz		15		pF
Output characteristics	Collector cutoff current	I_{CEO}	V_{CE} = 20V		5	100	nA
	Collector to emitter voltage	V_{CEO}	I_C = 100µA	80			V
	Collector to emitter capacitance	C_C	V_{CE} = 10V, f = 1MHz		3		pF
	Emitter to collector voltage	V_{ECO}	I_E = 10µA	7			V
Transfer characteristics	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 = 100Ω		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

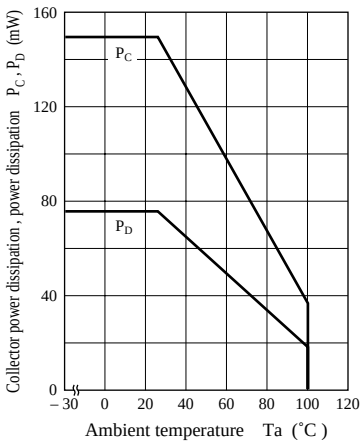


t_d: Delay time

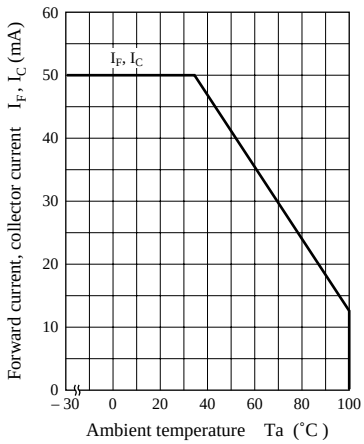
*5 CTR classifications

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

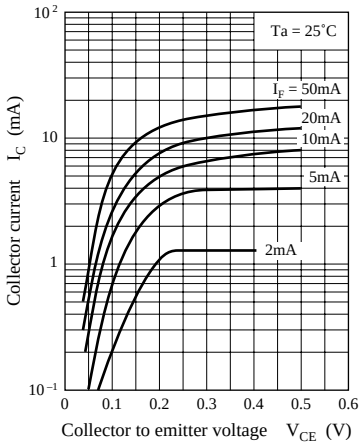
P_C , P_D — Ta



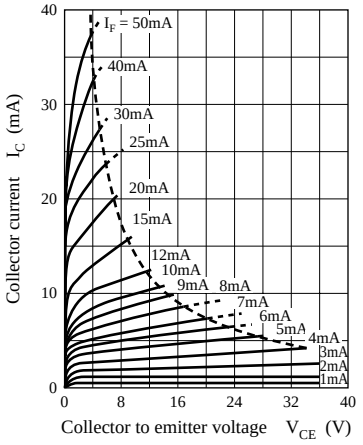
I_F , I_C — Ta



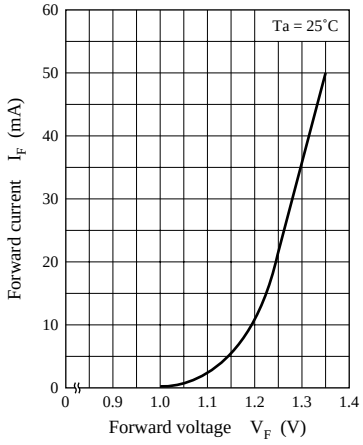
I_C — V_{CE}



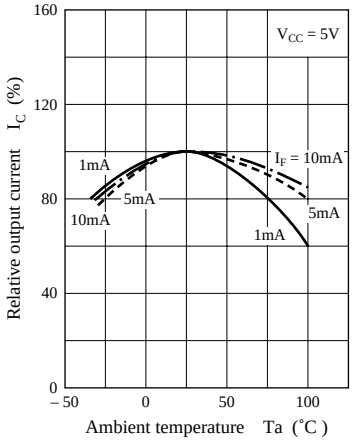
I_C — V_{CE}



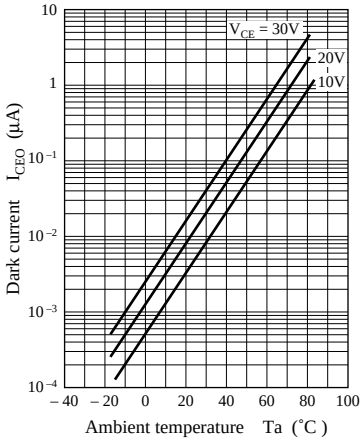
I_F — V_F



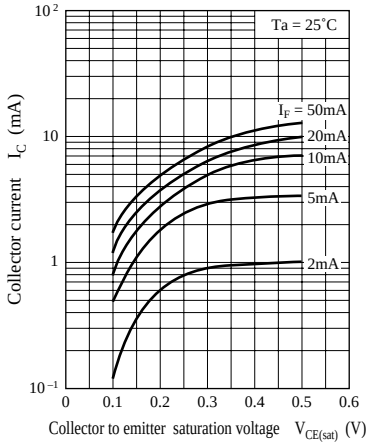
I_C — Ta



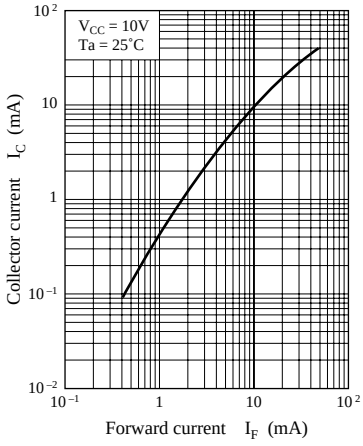
I_{CEO} — Ta



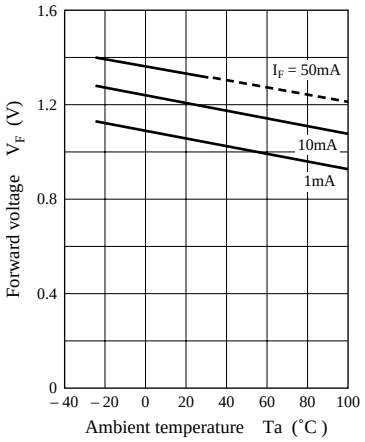
I_C — $V_{CE(sat)}$



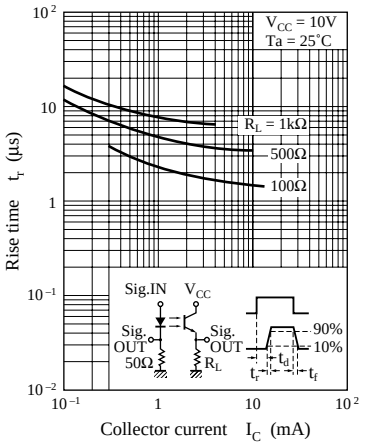
I_C — I_F



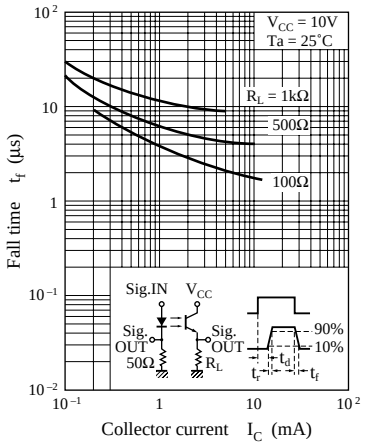
V_F — Ta



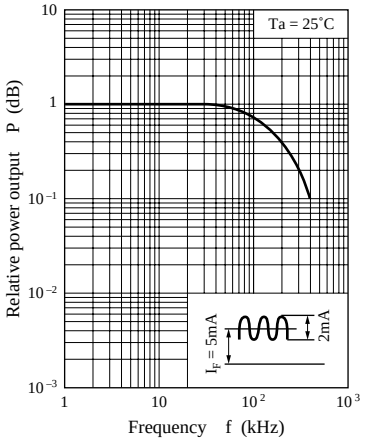
t_r — I_C



t_f — I_C



Frequency characteristics



Measurement circuit of frequency characteristics