

# CNC7S102

## Optoisolators

### Overview

CNC7S102 is an AC input compatible optoisolator in which two GaAs high output infrared light emitting diode chips are connected in reverse parallel as light emitting elements, and optically are connected to a high sensitivity Si phototransistor chip as a light detecting element in a small DIL 4-pin package.

### Features

- Large current input support :  $I_F = 150 \text{ mA (max.)}$
- AC input support
- High I/O isolation voltage :  $V_{ISO} = 5000 \text{ V}_{rms} \text{ (min.)}$
- UL listed (UL File No. E79940)

### Applications

- Telephones / Telephone switchers
- Fax, Modem
- AC/DC input modules

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

Parameter		Symbol	Ratings	Unit
Input (Light emitting diode)	Forward current (DC)	$I_F$	$\pm 150$	mA
	Pulse forward current	$I_{FP}$	$\pm 1$	A
	Power dissipation	$P_D$	250	mW
Output (Photo transistor)	Collector current	$I_C$	80	mA
	Collector to emitter voltage	$V_{CEO}$	55	V
	Emitter to collector voltage	$V_{ECO}$	7	V
	Collector power dissipation	$P_C$	150	mW
Isolation voltage, input to output		$V_{ISO}$	5000	$V_{rms}$
Operating ambient temperature		$T_{opr}$	$-30 \text{ to } +100$	$^\circ\text{C}$
Storage temperature		$T_{stg}$	$-55 \text{ to } +125$	$^\circ\text{C}$

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

Parameter		Symbol	Conditions	min	typ	max	Unit
Input characteristics	Forward voltage (DC)	$V_F$	$I_F = \pm 100 \text{ mA}$		1.3	1.7	V
	Capacitance between pins	$C_t$	$V_R = 0 \text{ V}, f = 1 \text{ MHz}$		35		pF
Output characteristics	Collector cutoff current	$I_{CEO}$	$V_{CE} = 20 \text{ V}$		5	100	nA
	Collector to emitter voltage	$V_{CEO}$	$I_C = 100 \mu\text{A}$	55			V
	Emitter to collector voltage	$V_{ECO}$	$I_E = 10 \mu\text{A}$	7			V
	Collector to emitter capacitance	$C_C$	$V_{CE} = 10 \text{ V}, f = 1 \text{ MHz}$		10		pF
Transfer characteristics	DC current transfer ratio	CTR	$V_{CE} = 1 \text{ V}, I_F = \pm 20 \text{ mA}$	25	100		%
	DC current transfer ratio(High)	CTR(High)	$V_{CE} = 1 \text{ V}, I_F = \pm 100 \text{ mA}$	20		80	%
	Isolation capacitance, input to output	$C_{ISO}$	$f = 1 \text{ MHz}$		0.6		pF
	Isolation resistance, input to output	$R_{ISO}$	$V_{ISO} = 500 \text{ V}$	$10^{11}$			$\Omega$
	Rise time	$t_r$	$V_{CC} = 10 \text{ V}, I_C = 2 \text{ mA},$ $R_L = 100 \Omega$		4		$\mu\text{s}$
	Fall time	$t_f$			3		$\mu\text{s}$
	Collector to emitter saturation voltage	$V_{CE(sat)}$	$I_F = \pm 20 \text{ mA}, I_C = 1 \text{ mA}$		0.1	0.2	V
	Collector current ratio	$I_{C(Ratio)}$	$V_{CE} = 1 \text{ V}, I_F = 20 \text{ mA}$	0.33	1.0	3.0	—

