

# CNC1S171

## Optoisolator

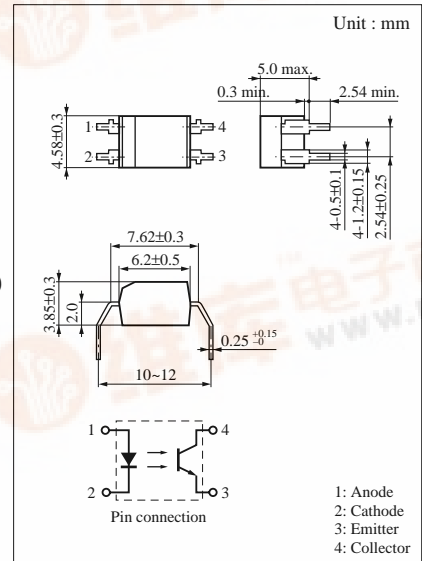
For isolated signal transmission

### Features

- High current transfer ratio : CTR >50%
- 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 :  $I_{CEO} < 100nA$
- VDE approved (VDE0884)
- UL listed (No. E79920)
- BSI certified (BS415 No. 7889, BS7002 No. 7890)
- SEMKO certified (No. 9625004)
- DEMKO certified (No. 305848)
- NEMKO certified (No. 199633176)
- FIMKO certified (No. 191784)
- CSA approved (No. CA109151)

### Absolute Maximum Ratings (Ta = 25°C)

Parameter		Symbol	Rated	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
Isolation voltage, input to output		$V_{ISO}$	5000	$V_{rms}$
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	$C_i$	$V_R = 0V, f = 1MHz$		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	$C_C$	$V_{CE} = 10V, f = 1MHz$		10		pF
Transfer characteristics	DC current transfer ratio	CTR <sup>*1*4</sup>	$V_{CE} = 10V, I_F = 5mA$	50		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	$t_r^{*2}$	$V_{CC} = 10V, I_C = 5mA,$		2		μs
	Fall time	$t_f^{*3}$	$R_L = 100\Omega$		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.

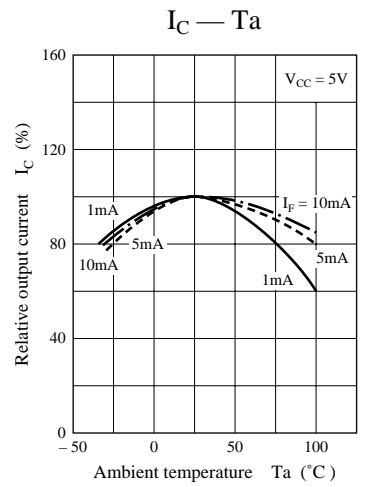
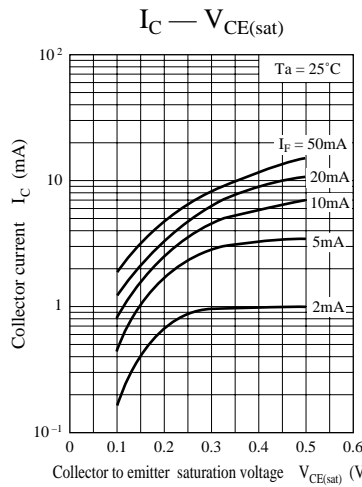
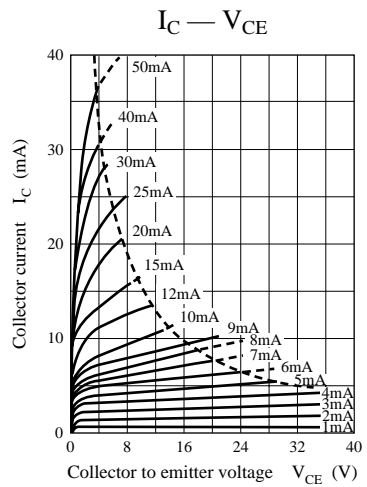
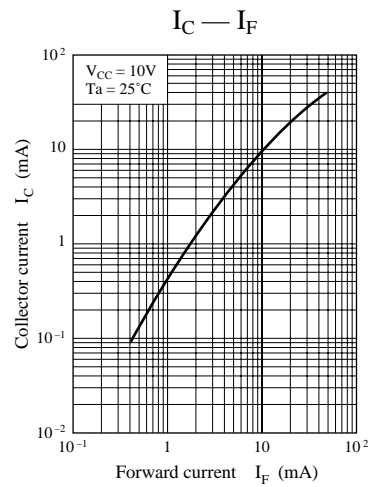
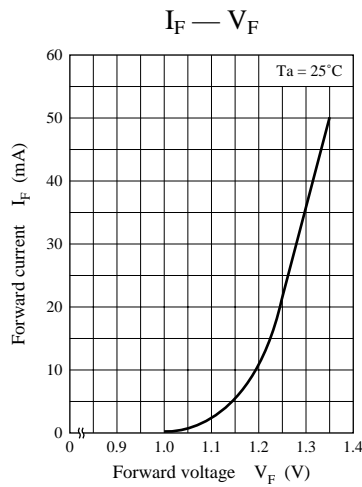
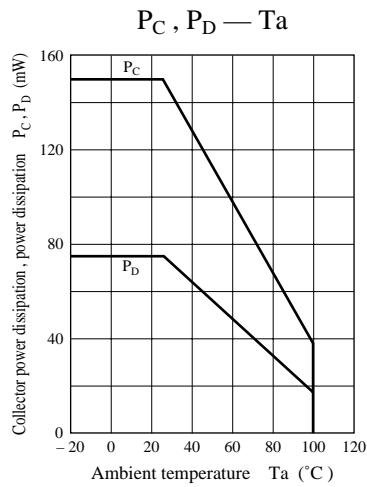
\*2  $t_r$ : Time required for the collector current to increase from 10% to 90% of its final value

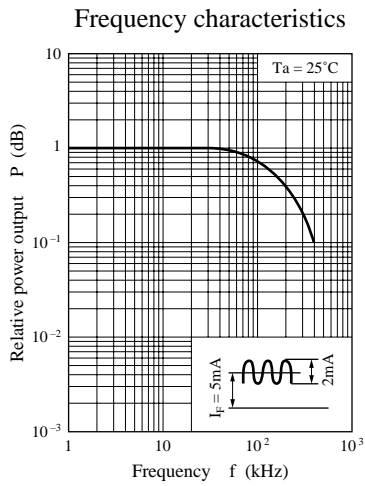
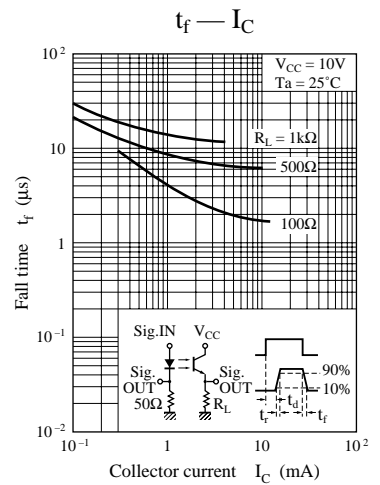
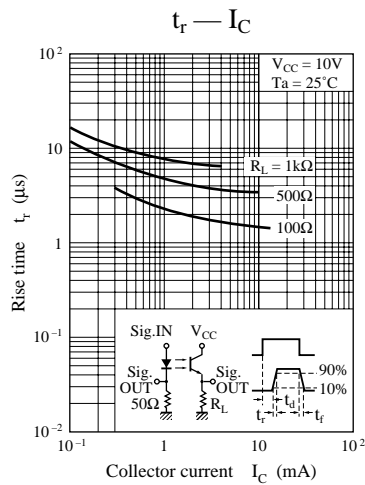
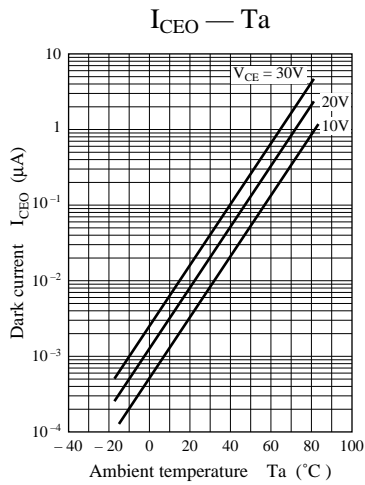
\*3  $t_f$ : Time required for the collector current to decrease from 90% to 10% of its initial value



\*4 CTR classifications

Class	Q	R	S
CTR (%)	50 to 120	100 to 250	200 to 600





Measurement circuit of frequency characteristics

