

# CNC1S171 (ON3171)

## Optoisolator

For isolated signal transmission

### ■ Features

- High current transfer ratio: CTR > 50%
- 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.)
- Low collector-emitter cutoff current (base open):  $I_{CEO} < 100\ \text{nA}$
- UL listed (UL File No. E79920)

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

Parameter		Symbol	Rating	Unit
Input (Light emitting diode)	Power dissipation *1	$P_D$	75	mW
	Forward current	$I_F$	50	mA
	Pulse forward current *2	$I_{FP}$	1	A
	Reverse voltage	$V_R$	6	V
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		$V_{ISO}$	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

Note) \*1: Input power derating ratio is 0.75 mW/°C at  $T_a \geq 25^\circ\text{C}$ .

\*2: Pulse width  $\leq 100\ \mu\text{s}$ , repeat 100 pps

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

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

Note) The part number in the parenthesis shows conventional part number.

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

Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Input characteristics	Reverse current	$I_R$	$V_R = 3\text{ V}$			10	$\mu\text{A}$
	Forward voltage	$V_F$	$I_F = 50\text{ mA}$		1.35	1.5	V
	Terminal capacitance	$C_t$	$V_R = 0\text{ V}, f = 1\text{ MHz}$		15		pF
Output characteristics	Collector-emitter voltage (Base open)	$V_{\text{CEO}}$	$I_C = 100\ \mu\text{A}$	80			V
	Emitter-collector voltage (Base open)	$V_{\text{ECO}}$	$I_E = 10\ \mu\text{A}$	7			V
	Collector-emitter cutoff current (Base open)	$I_{\text{CEO}}$	$V_{\text{CE}} = 20\text{ V}$		5	100	nA
	Collector-emitter capacitance	$C_C$	$V_{\text{CE}} = 10\text{ V}, f = 1\text{ MHz}$		10		pF
Transfer characteristics	DC current transfer ratio *1	CTR	$V_{\text{CE}} = 10\text{ V}, I_F = 5\text{ mA}$	50		600	%
	Isolation capacitance, input to output	$C_{\text{ISO}}$	$f = 1\text{ MHz}$		0.7		pF
	Isolation resistance, input to output	$R_{\text{ISO}}$	$V_{\text{ISO}} = 500\text{ V}$	$10^{11}$			$\Omega$
	Rise time *2	$t_r$	$V_{\text{CC}} = 10\text{ V}, I_C = 2\text{ mA}, R_L = 100\ \Omega$		2		$\mu\text{s}$
	Fall time *3	$t_f$	$\Omega$		3		$\mu\text{s}$
	Collector-emitter saturation voltage	$V_{\text{CE(sat)}}$	$I_F = 20\text{ mA}, I_C = 1\text{ mA}$		0.1	0.2	V

Note) 1. Input and output are practiced by electricity.

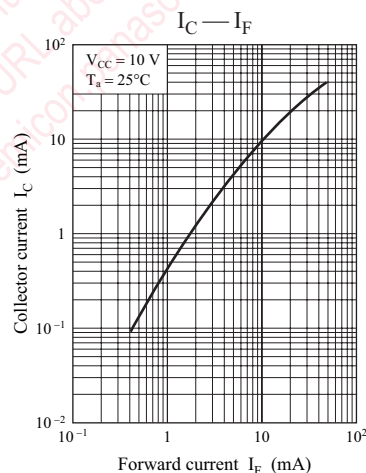
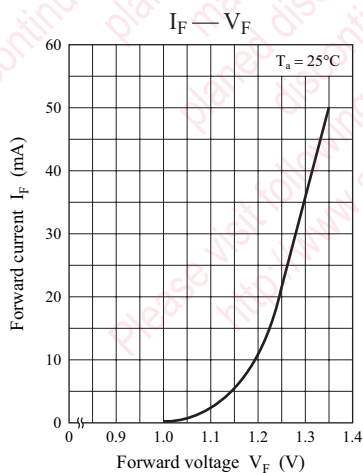
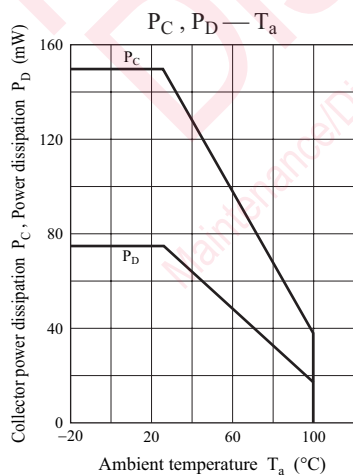
2. This device is designed by disregarding radiation.

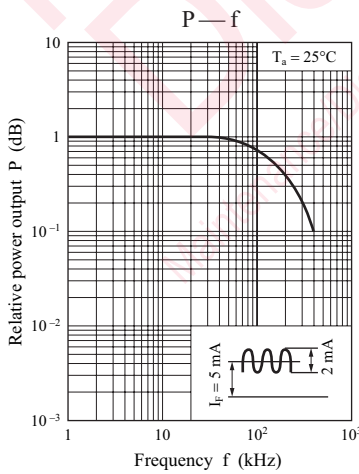
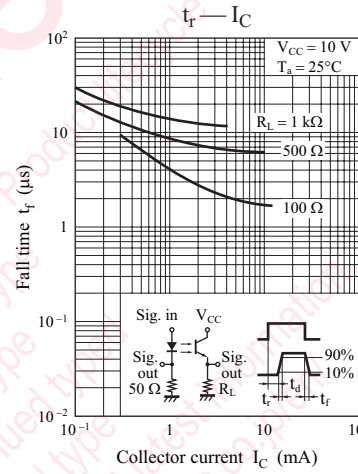
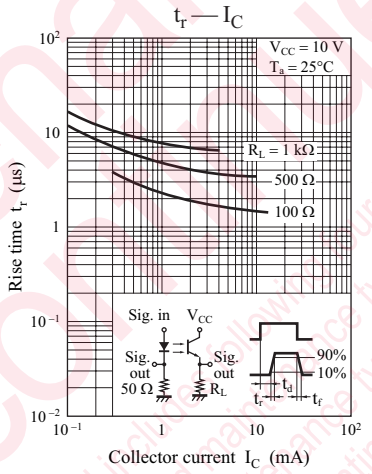
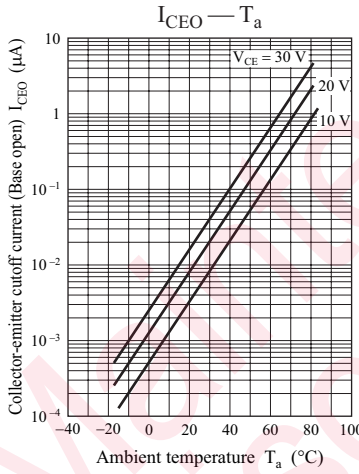
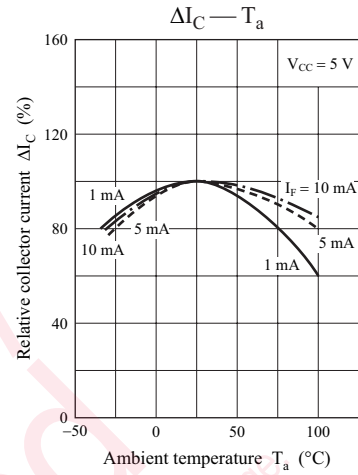
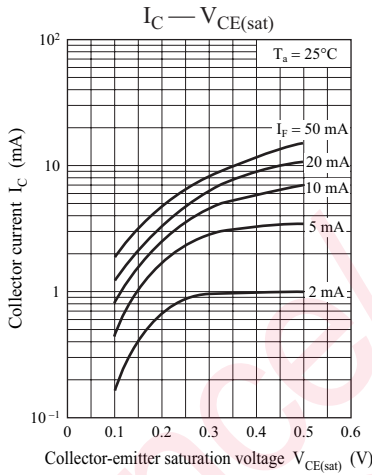
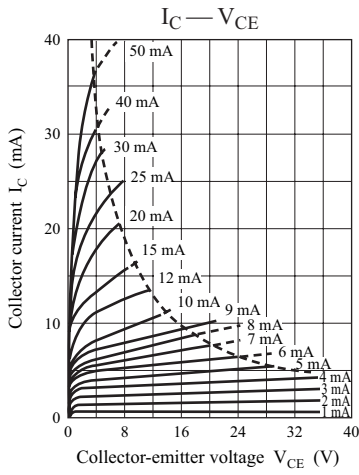
3. \*1:

$$\text{CTR} = \frac{I_C}{I_F} \times 100\%$$

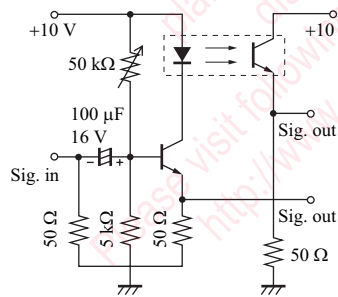
\*2:  $t_r$ : Time required for the collector current to increase from 10% to 90% of its final value

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



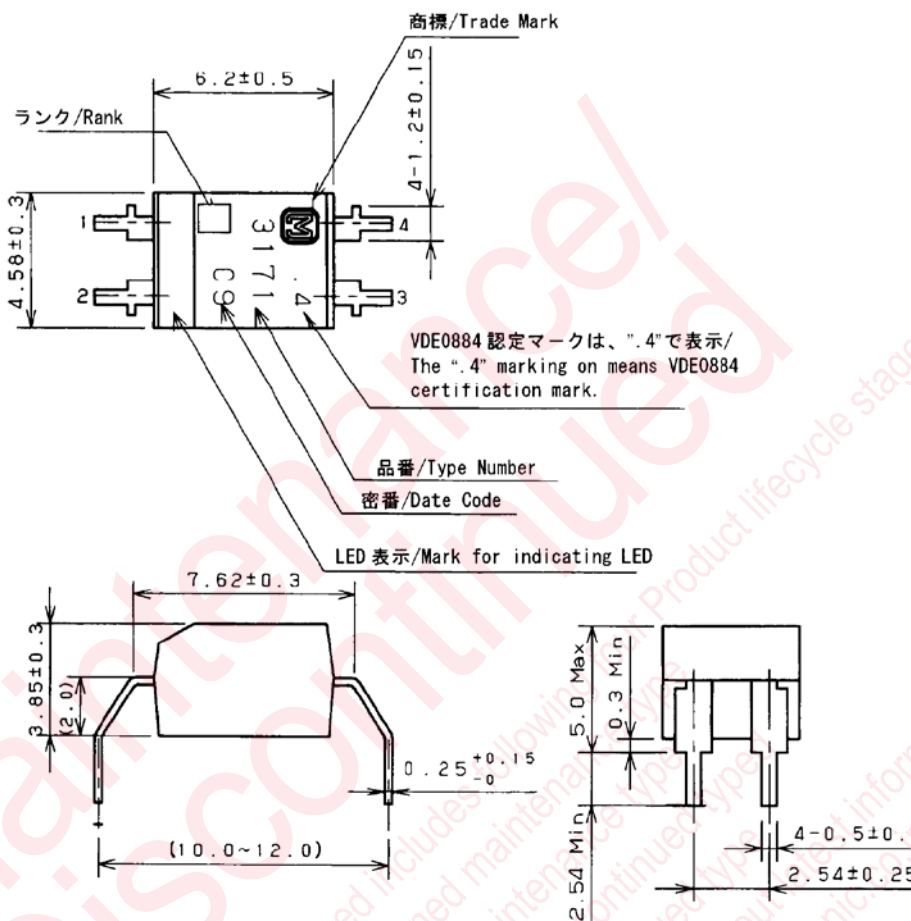


Measurement circuit of frequency characteristics



■ Package (Unit: mm)

LCTXXN4Z0002



(注1) マークは、目視又は顕微鏡に於いて解読できる事。  
(Note1) What a mark sees an attention and can decode in a microscope.

- Pin name
- 1: Anode
- 2: Cathode
- 3: Emitter
- 4: Collector

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