

CNC1S171 (ON3171)

Optoisolator

For isolated signal transmission

■ Features

- High current transfer ratio: CTR > 50% • UL listed (No. E79920)
- High I/O isolation voltage: • BSI certified
 $V_{ISO} = 5\,000\text{ V[rms]}$ (min.) (BS415 No. 7889, BS7002 No.7890)
- Fast response: • SEMKO certified (No. 9625004)
 $t_r = 2\ \mu\text{s}$, $t_f = 3\ \mu\text{s}$ (typ.) • DEMKO certified (No. 305848)
- Low collector-emitter cutoff current • NEMKO certified (No. 199633176)
(Base open) : $I_{CEO} < 100\ \text{nA}$ • FIMKO certified (No. 191784)
- VDE approved (VDE0884) • CSA approved (No. CA109151)

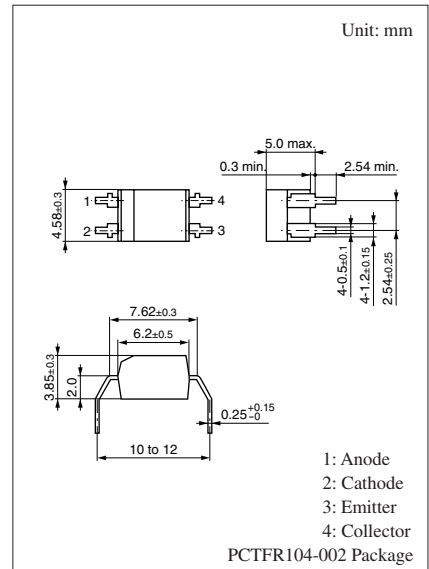
■ Absolute Maximum Ratings $T_a = 25^\circ\text{C}$

Parameter		Symbol	Rating	Unit
Input (Light emitting diode)	Reverse voltage	V_R	6	V
	Forward current	I_F	50	mA
	Pulse forward current *1	I_{FP}	1	A
	Power dissipation *2	P_D	75	mW
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		V_{ISO}	5 000	V[rms]
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	$^\circ\text{C}$

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

Parameter		Symbol	Conditions	Min	Typ	Max	Unit
Input characteristics	Forward voltage	V_F	$I_F = 50\ \text{mA}$		1.35	1.50	V
	Reverse current	I_R	$V_R = 3\ \text{V}$			10	μA
	Terminal capacitance	C_t	$V_R = 0\ \text{V}$, $f = 1\ \text{MHz}$		15		pF
Output characteristics	Collector-emitter voltage (Base open)	V_{CEO}	$I_C = 100\ \mu\text{A}$	80			V
	Emitter-collector voltage (Base open)	V_{ECO}	$I_E = 10\ \mu\text{A}$	7			V
	Collector-emitter cutoff current (Base open)	I_{CEO}	$V_{CE} = 20\ \text{V}$		5	100	nA
	Collector-emitter capacitance	C_C	$V_{CE} = 10\ \text{V}$, $f = 1\ \text{MHz}$		10		pF
Transfer characteristics	DC current transfer ratio *1,4	CTR	$V_{CE} = 10\ \text{V}$, $I_F = 5\ \text{mA}$	50		600	%
	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 *2	t_r	$V_{CC} = 10\ \text{V}$, $I_C = 2\ \text{mA}$		2		μs
	Fall time *3	t_f	$R_L = 100\ \Omega$		3		μs
	Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_F = 20\ \text{mA}$, $I_C = 1\ \text{mA}$		0.1	0.2	V

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



Note) *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-Optical Characteristics (continued) $T_a = 25^\circ\text{C} \pm 3^\circ\text{C}$

Note) 1. Input and output are handled electrically.

2. This product is not designed to withstand radiation

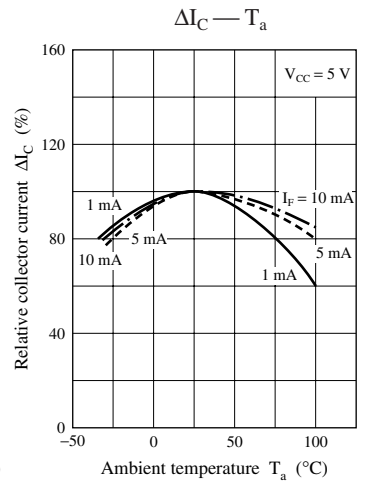
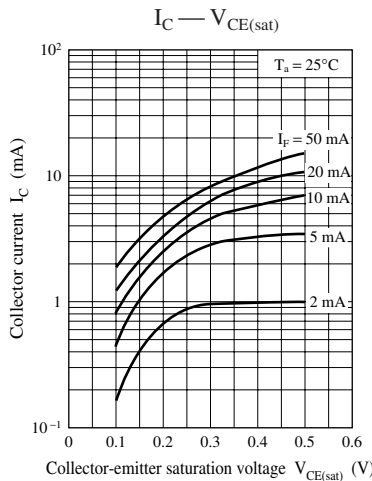
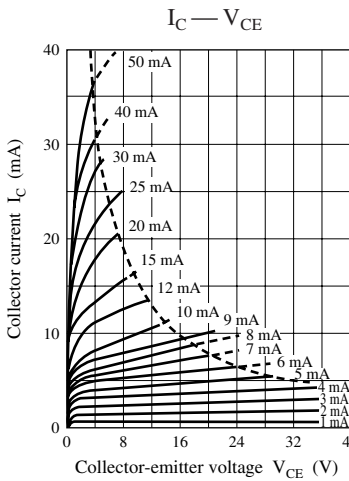
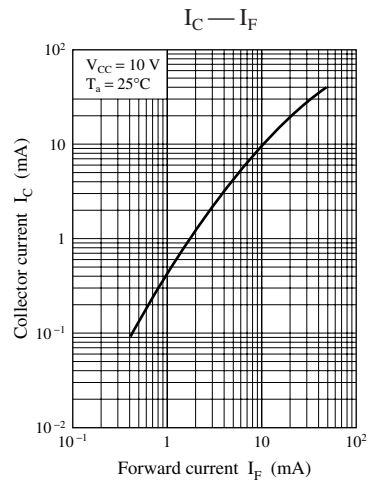
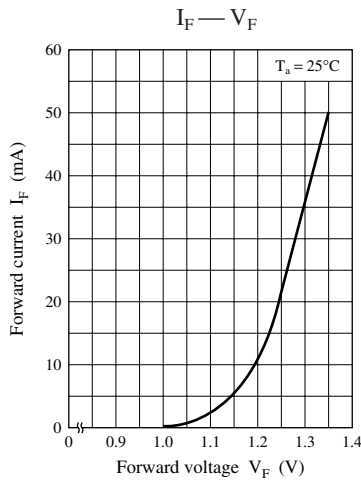
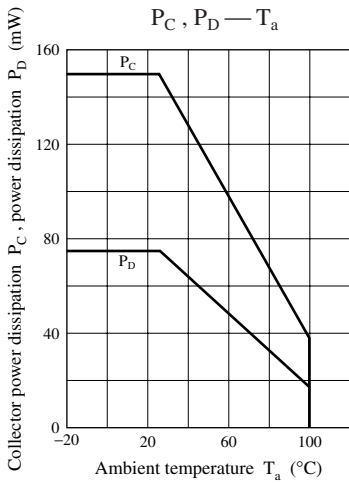
3. *1:
$$\text{CTR} = \frac{I_C}{I_F} \times 100\%$$

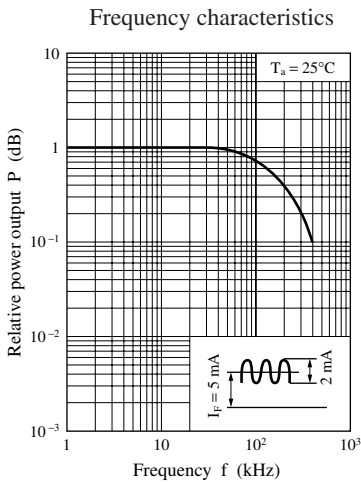
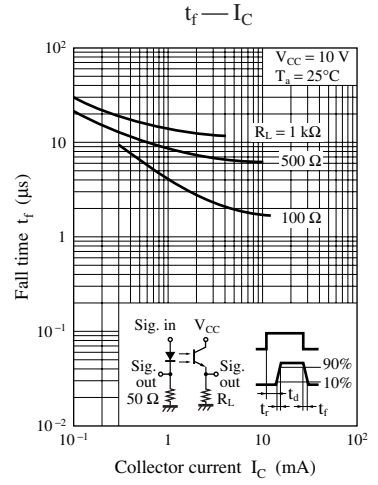
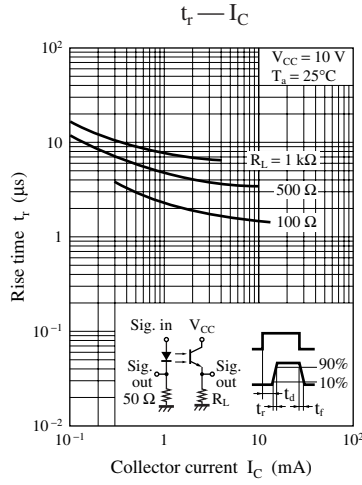
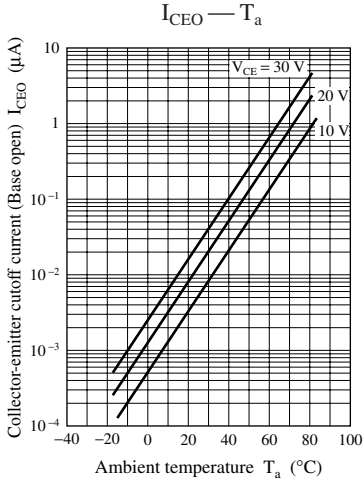
*2: t_r : Time required for the collector current to increase from 10% to 90% of its final value

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

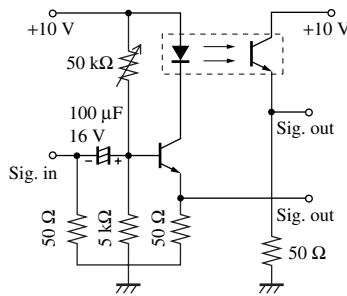
*4: Rank classification

Rank	Q	R	S	No-rank
CTR (%)	50 to 120	100 to 250	200 to 600	50 to 600





Measurement circuit of frequency characteristics



Caution for Safety

 **DANGER**

■ This product contains Gallium Arsenide (GaAs).

GaAs powder and vapor are hazardous to human health if inhaled or ingested. Do not burn, destroy, cut, cleave off, or chemically dissolve the product. Follow related laws and ordinances for disposal. The product should be excluded from general industrial waste or household garbage.

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