NEC

PHOTOTRANSISTOR
PH108

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DESCRIPTION

The PH108 is a phototransistor in a plastic molded package, and very suitable for a detector of a photointerrupter with combination of the SE308.

Since the device is housed in a small package with a lens, when it is used along with an infrared ray LED SE308 in the same shape, a small photointerrupter can be formed.

FEATURES

- Small size plastic molded package. (4.0 × 2.8 × 2.5 mm)
- High Sensitivity.
  (I_L = 0.9 mA TYP. @ V_{CE} = 5 V, H = 0.5 mW/cm^2)
- Spectrally matched to GaAs infrared emitter.

QUALITY GRADE

Standard

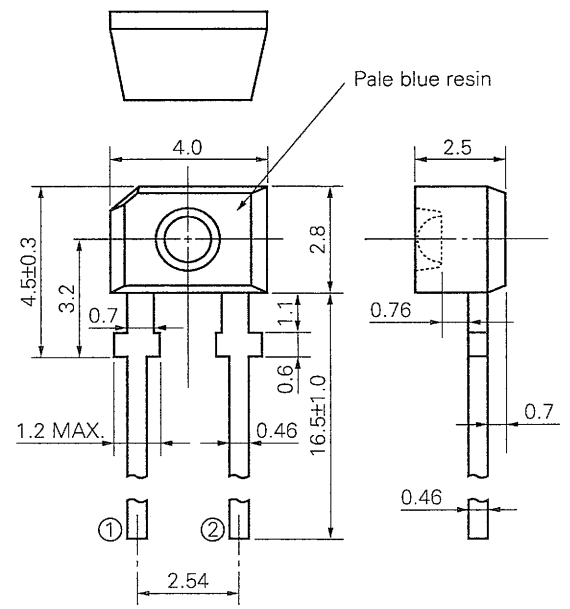
Please refer to "Quality grade on NEC Semiconductor Devices" (Document number IEI-1209) published by NEC Corporation to know the specification of quality grade on the devices and its recommended applications.

APPLICATIONS

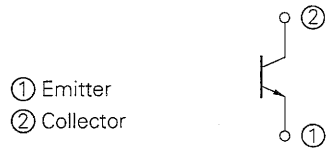
- Photo Sensor for photointerrupter.
- Optical encoder.
- High speed Optoelectronic Data Links.

PACKAGE DIMENSIONS

(Unit: mm)



PIN CONNECTION



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ABSOLUTE MAXIMUM RATINGS (T_a = 25 °C)

Collector to Emitter Voltage	V_{CEO}	30	V
Collector Current	I_C	40	mA
Power Dissipation	P_C	100	mW
Junction Temperature	T_j	100	°C
Storage Temperature	T_{stg}	−40 to +100	°C
Operating Temperature	T_{opt}	−20 to +80	°C

ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
Collector to Emitter Dark Current	I_{CEO}			100	nA	V_{CE} = 10 V, H = 0 mW/cm^2
Collector Saturation Voltage	$V_{CE\ (sat)}$			0.3	V	I_C = 0.5 mA, H = 5 mW/cm^2*
Photo Current	I_L	0.3	0.9		mA	V_{CE} = 5 V, H = 0.5 mW/cm^2*
Fall Time	t_f			40	μs	V_{CC} = 10 V, H = 0.5 mW/cm^2*, R_L = 1 kΩ

*Measured with a GaAs infrared LED with λ_P = 940 nm.

TYPICAL CHARACTERISTICS (T_a = 25 °C)

POWER DISSIPATION vs. AMBIENT TEMPERATURE

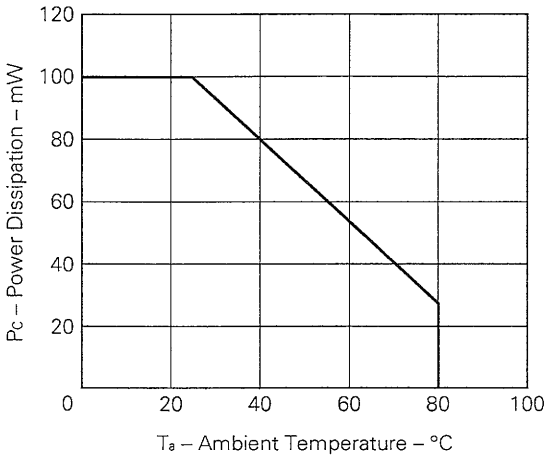
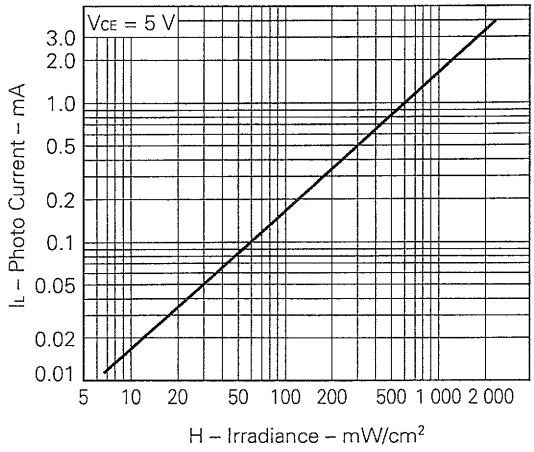
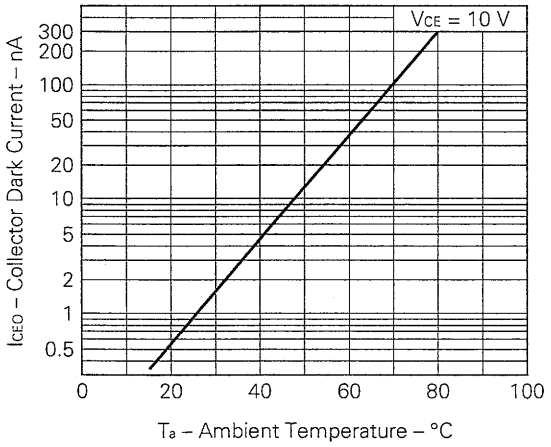


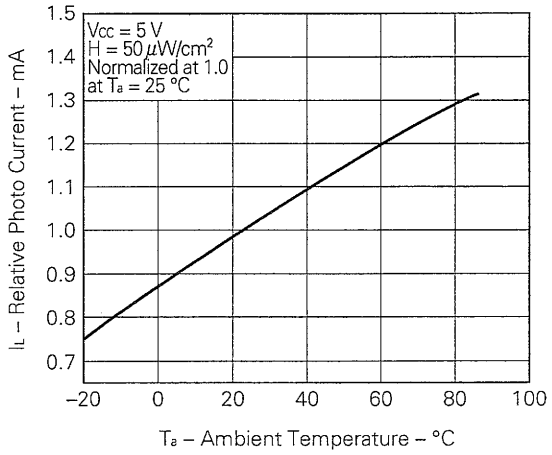
PHOTO CURRENT vs. IRRADIANCE



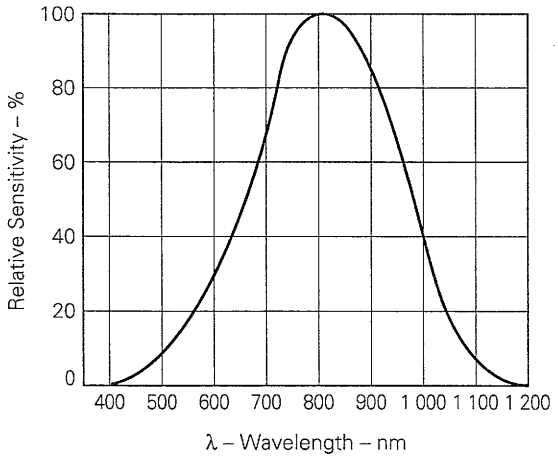
COLLECTOR DARK CURRENT vs. AMBIENT TEMPERATURE



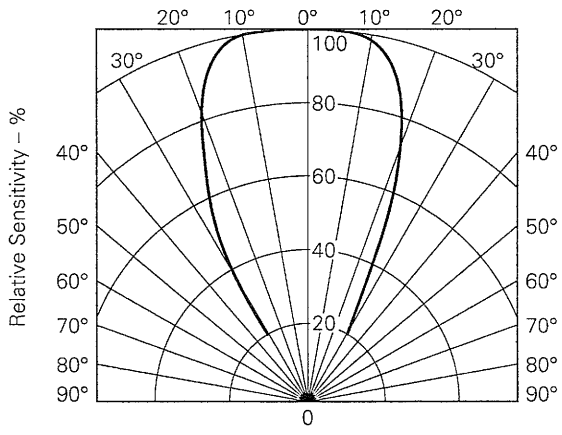
RELATIVE PHOTO CURRENT vs. AMBIENT TEMPERATURE



WAVELENGTH SENSITIVITY



SPATIAL DISTRIBUTION



HANDLING PRECAUTIONS:

- **Soldering**

The full resin-molded PH108 has generally a little mechanical and thermal strength than other resin-molded semiconductor devices as they have less additives. Therefore please note on the following points.

(a) Soldering of leads should be made at the point 2 mm or more from the root of the case at 260 °C and within 5 s.
(b) Please keep the package temperature less than 100 °C.
(c) If the temperature of the molded portion rises in addition to the residual stress between the lead, the possibility that open or short circuit occurs due to the deformation or destruction of the resin will increase.

- On cleaning the device:

(a) Cleaning with unsuitable solvent may impair the resin of the package and the following solvents should be used at the temperature of less than 45 °C and for less than 3 minutes of immersion time.
Ethanol, Methanol, Isopropyl-alcohol
(b) Ultrasonic cleaning will add some stress on devices. The degree of the stress differs depending on the oscillation output power, the size of the PCB and the mounting methods of the devices, therefore it should be confirmed by making an experiment at actual conditions that the cleaning does not have any problem on the devices.

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