NEC

PHOTOTRANSISTOR
PH103

DARLINGTON PHOTOTRANSISTOR

— NEPOC SERIES —

The PH103 is a darlington phototransistor in a plastic molded package, and very suitable for a detector of a photointerrupter.

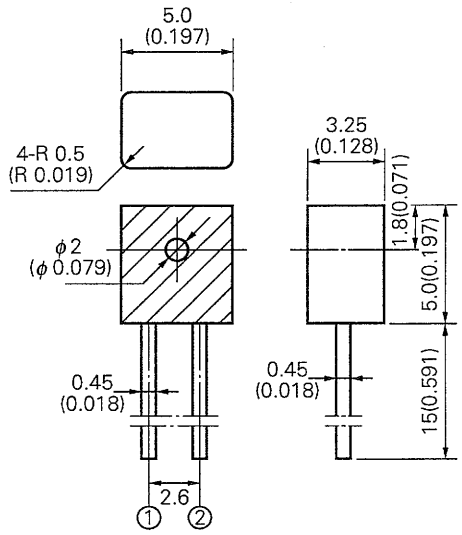
QUALITY GRADE

Standard

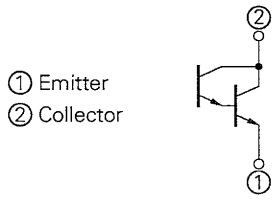
Please refer to "Quality grade on NEC Semiconductor Devices" (Document number IEI-1209) published by NEC Corporation to know the specification of quality grade on the devices and its recommended applications.

PACKAGE DIMENSIONS

in millimeters (inches)



PIN CONNECTION



ABSOLUTE MAXIMUM RATINGS (T_a = 25 °C)

Collector to Emitter Voltage	V_{CEO}	30	V
Collector Current	I_C	50	mA
Power Dissipation	P_D	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}		10	400	nA	V_{CE} = 10 V, L = 0 lx
Collector Saturation Voltage	$V_{CE\ (sat)}$		0.7	1.5	V	I_C = 10 mA, L = 1 000 lx*1
Photo Current*2	I_L	2.0	12		mA	V_{CE} = 2 V, L = 100 lx*1

*1 Measured with a tungsten filament lamp operated at a color temperature of 2 854 K.

*2 I_L rank K : 18 mA to L : 10 to 23 mA, M : 2 to 15 mA

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TYPICAL CHARACTERISTICS (T_a = 25 °C)

PHOTO CURRENT vs.
COLLECTOR TO EMITTER VOLTAGE

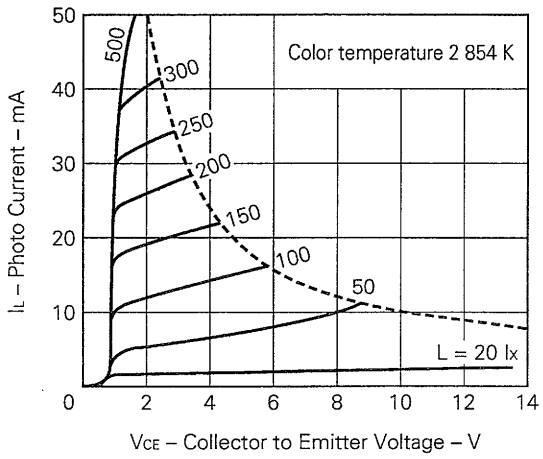
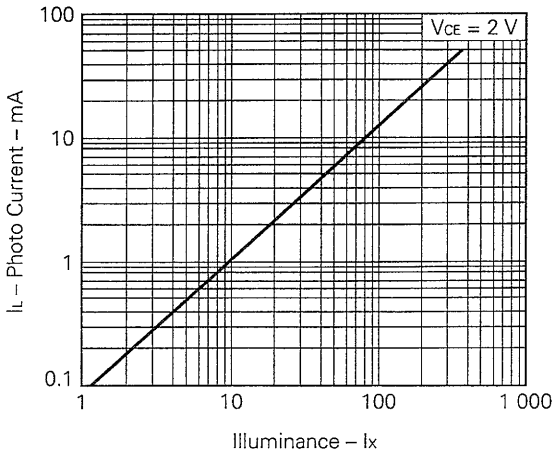
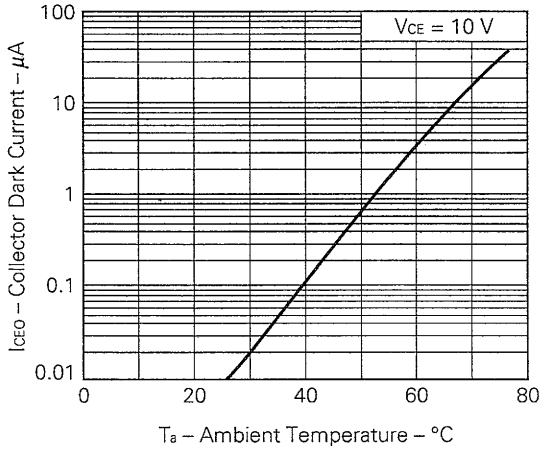


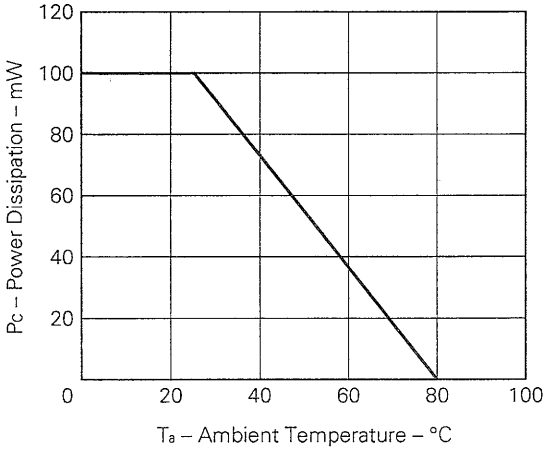
PHOTO CURRENT vs. ILLUMINANCE



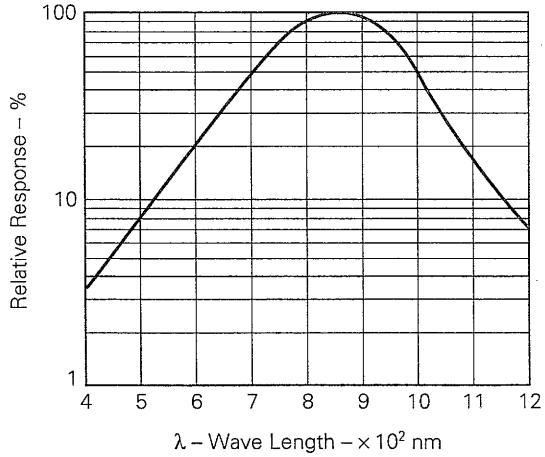
COLLECTOR DARK CURRENT vs.
AMBIENT TEMPERATURE



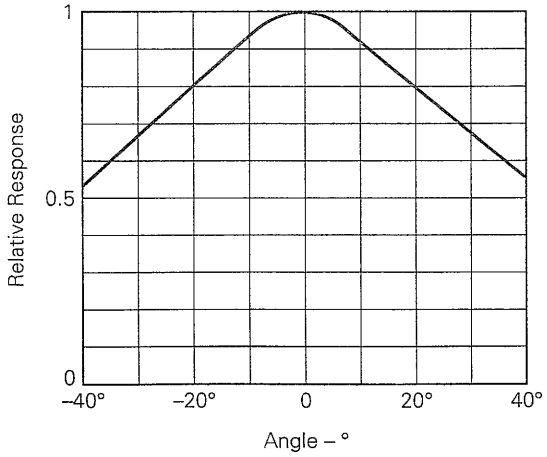
POWER DISSIPATION vs.
AMBIENT TEMPERATURE



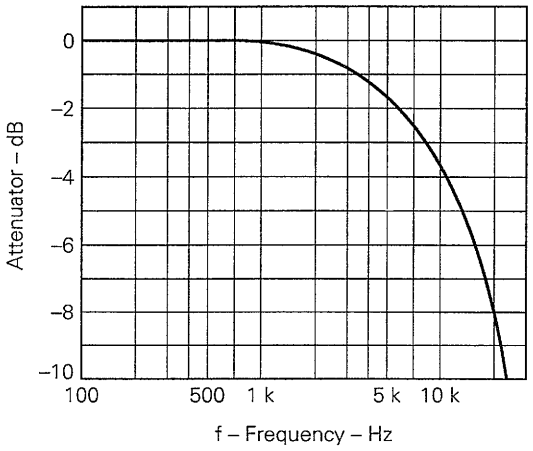
SPECTRAL RESPONSE



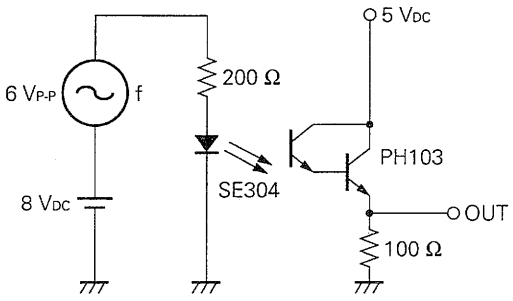
SPATIAL DISTRIBUTION



FREQUENCY RESPONSE



FREQUENCY RESPONSE TEST CIRCUIT



HANDLING PRECAUTIONS:

- **Soldering**

The full resin-molded PH103 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 leads, 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.

[MEMO]

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