NEC

PIN PHOTODIODE
PH320

PIN PHOTODIODE

— NEPOC SERIES —

The PH320 is a PIN structure photodiode which is molded with visible-ray shielding resin, thus activating the light-receiving sensitivity at approx. 840 nm and leading to little possibility of malfunction by fluorescent lamps.

As the high-speed response is possible and the infrared ray sensitivity (λ = 940 nm) is the same as PH302C, PH309 and PH310, it is ideally suited for various types of remote control applications.

FEATURES

- Ultra high speed response (t_r = 30 ns, t_f = 50 ns TYP.)
- Superlative wave matching the characteristic for infrared LED ($\lambda_{max.}$ = 990 nm TYP.)
- Light receiving sensitivity:
  4.4 μA (@ V_R = 5 V, H = 0.1 μW/cm^2)
- Compact package
- Infrared-ray filter resin molding (Rise wavelength: 840 nm)

QUALITY GRADE

Standard

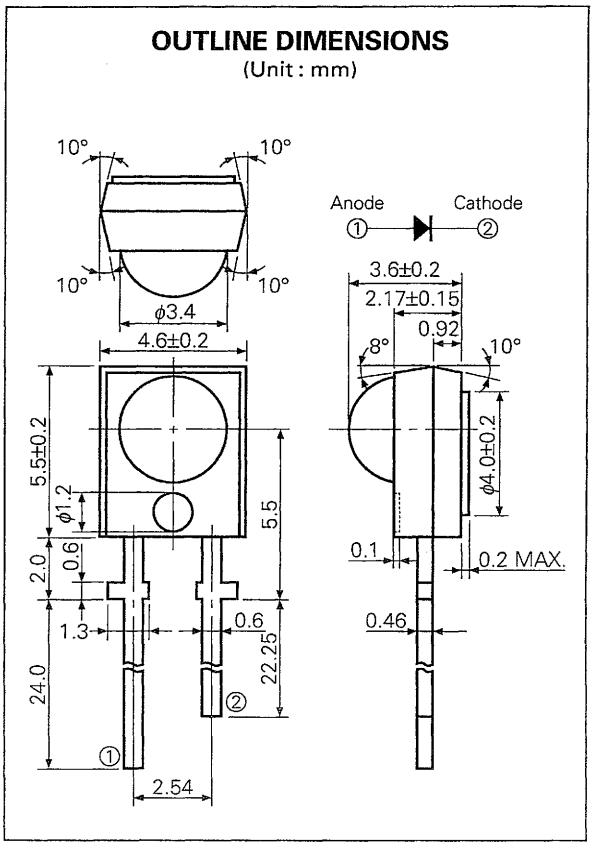
Please refer to "Quality grade on NEC Semiconductor Devices" (Document number IEI-1209) published by NEC Corporation to know the specification of quality grade on the devices and its recommended applications.

APPLICATIONS

- Photosensor for TV remote control.

OUTLINE DIMENSIONS

(Unit : mm)



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ABSOLUTE MAXIMUM RATINGS (T_a = 25 °C)

Reverse Voltage	V_R	32	V
Power Consumption	P_D	100	mW
Operating Temperature	T_{opt}	−30 to +85	°C
Storage Temperature	T_{stg}	−40 to +100	°C

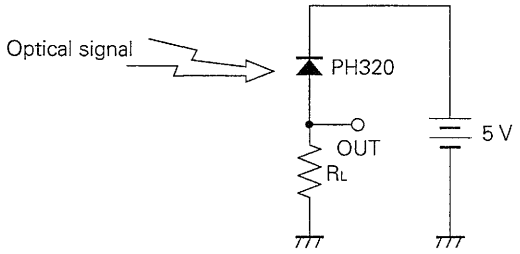
ELECTRICAL CHARACTERISTICS (T_a = 25 °C)

ITEMS	SYMBOL	MIN.	TYP.	MAX.	UNIT	CONDITIONS
Dark current	I_R			10	nA	V_R = 10 V
Maximum sensitivity wavelength	$\lambda_{MAX.}$ *1		940		nm	
Product maximum sensitivity wavelength	$\lambda_{SMAX.}$ *2		990		nm	
Quantum efficiency	η		0.88			λ = 940 nm
Infrared ray sensitivity	S_{IR}	3.6	4.4		μA	V_R = 5 V, H = 0.1 μW/cm²
Rise time	t_r		30		ns	R_L = 1 kΩ, V_R = 5 V, λ = 940 nm
Fall time	t_f		50			R_L = 1 kΩ, V_R = 5 V, λ = 940 nm
Capacitance between terminal	C_t		8		pF	V_R = 5 V, f = 1 MHz
Light receiving area	A		3.6		mm²	—

*1 $\lambda_{MAX.}$: PIN photodiode chip maximum sensitivity wavelength

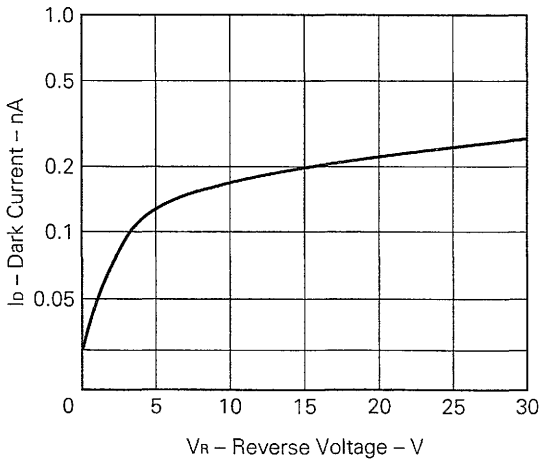
*2 $\lambda_{SMAX.}$: Maximum sensitivity wavelength as a product including molding resin

RECOMMENDED APPLICATION

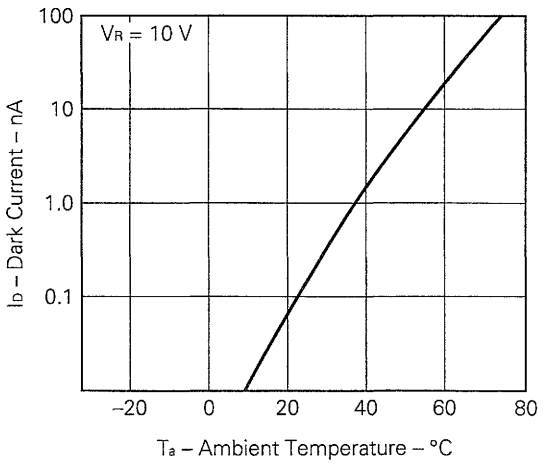


STANDARD CHARACTERISTICS (T_a = 25 °C)

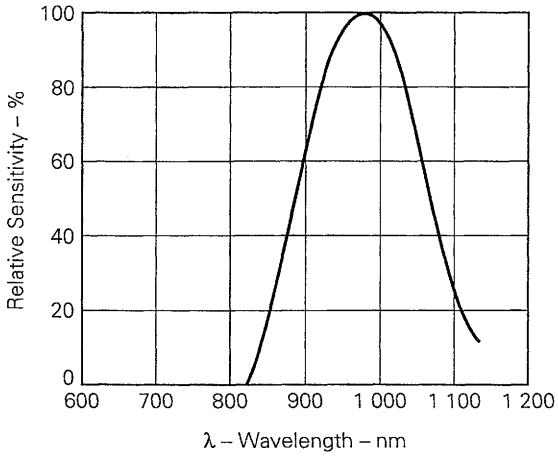
DARK CURRENT vs. REVERSE VOLTAGE



DARK CURRENT vs. AMBIENT TEMPERATURE



WAVELENGTH SENSITIVITY



RISE TIME, FALL TIME vs.
REVERSE VOLTAGE

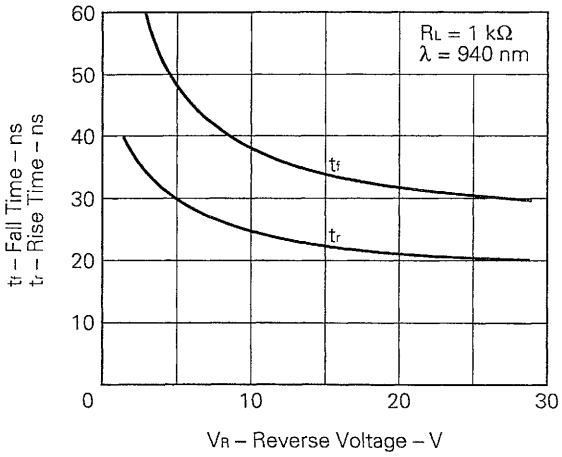


PHOTO CURRENT vs. REVERSE VOLTAGE

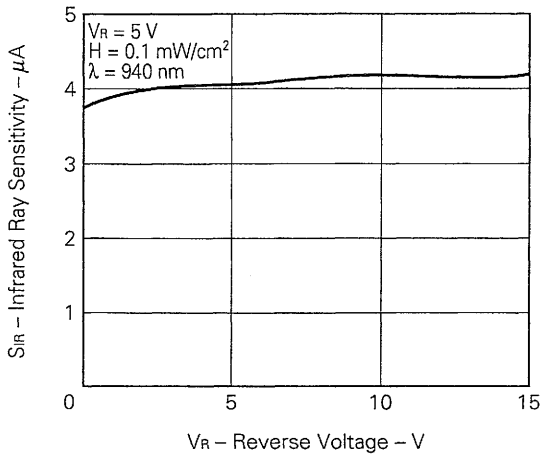


PHOTO CURRENT (Relative) vs. AMBIENT TEMPERATURE

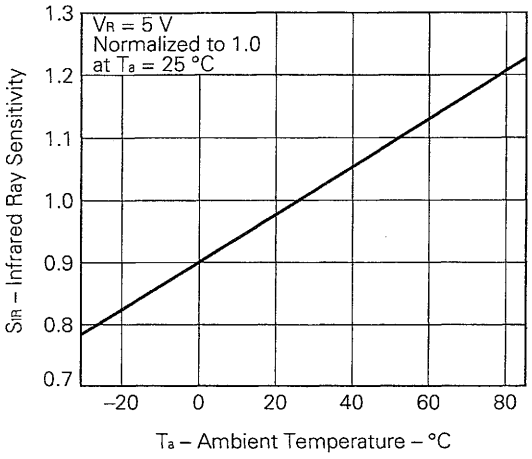
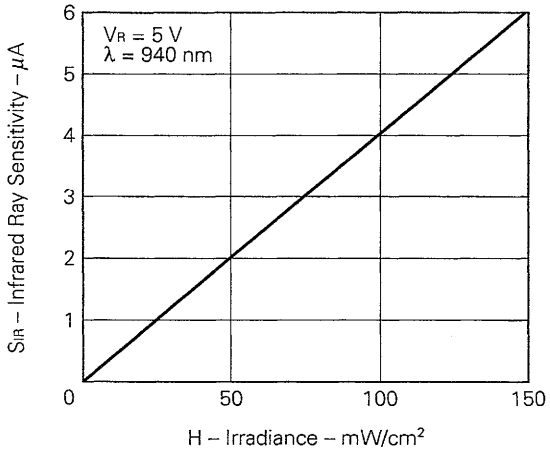
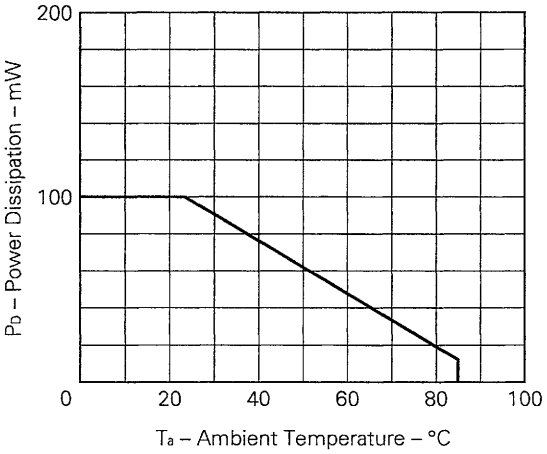


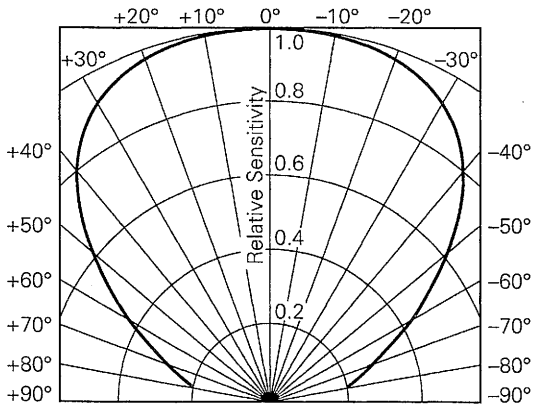
PHOTO CURRENT vs. IRRADIANCE



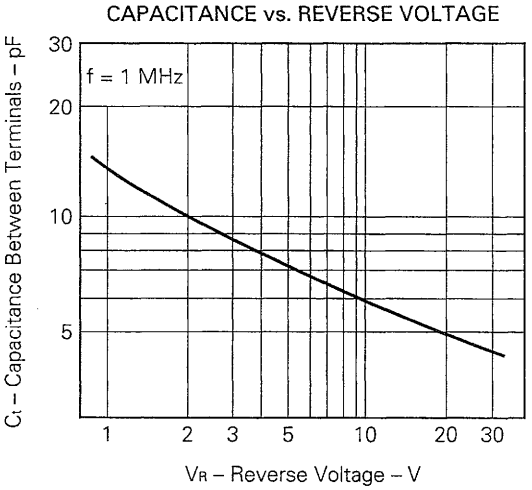
POWER DISSIPATION vs. AMBIENT TEMPERATURE



SPATIAL DISTRIBUTION



CAPACITANCE vs. REVERSE VOLTAGE



HANDLING PRECAUTIONS:

1. The full resin-molded PH320 has generally a little less 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 3 mm or more from the root of the leads at 260 °C and within 5 s.
   (b) 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.

2. On cleaning the device:
   (a) Cleaning with unsuitable solvent may impair the resin if 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.
   Freon TE, Freon TF, Ethanol, Methanol
   Difron-solvent, 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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