

**TOSHIBA**

**TPS612**

TOSHIBA PHOTO TRANSISTOR SILICON NPN EPITAXIAL PLANAR

# TPS612

FOR PHOTO SENSOR

Unit in mm

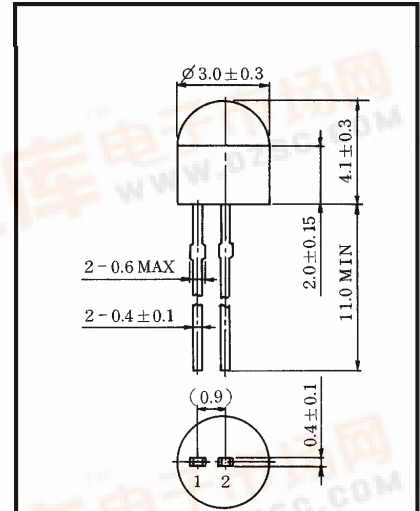
PHOTOELECTRIC COUNTER

FLOPPY DISK DRIVE

POSITION DETECTION

CONTROLLER OF HOME ELECTRIC EQUIPMENT

- $\phi 3\text{mm}$  resin package (black)
- About medium sensitivity
- Half value angle :  $\theta_{\frac{1}{2}} = \pm 30^\circ$  (TYP.)
- The same size TLN113 is available as in infrared LED.
- Protected from external light by black mold packaging.



( ) : REFERENCE VALUE

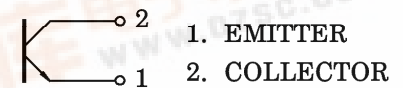
MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Emitter Voltage	V <sub>CEO</sub>	20	V
Emitter-Collector Voltage	V <sub>ECO</sub>	5	V
Collector Current	I <sub>C</sub>	20	mA
Collector Power Dissipation	P <sub>C</sub>	75	mW
Collector Power Dissipation Derating (Ta > 25°C)	$\Delta P_C / ^\circ\text{C}$	-1	mW / °C
Operating Temperature Range	T <sub>opr</sub>	-20~75	°C
Storage Temperature Range	T <sub>stg</sub>	-30~100	°C

JEDEC	—
EIAJ	—
TOSHIBA	0-3C1

Weight : 0.08g (TYP.)

PIN CONNECTION



961001EAA2

- TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.

## OPTO-ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Dark Current		$I_D (I_{CEO})$	$V_{CE} = 10V, E = 0$	—	0.01	0.1	$\mu A$
Light Current		$I_L$ (Note 1)	$V_{CE} = 3V, E = 0.1mW/cm^2$ (Note 2)	14	—	180	$\mu A$
Collector-Emitter Saturation Voltage		$V_{CE} (sat)$	$I_C = 7\mu A, E = 0.1mW/cm^2$ (Note 2)	—	0.2	0.4	V
Switching Time	Rise Time	$t_r$	$V_{CC} = 10V, I_C = 1mA$ $R_L = 100\Omega$	—	4	—	$\mu s$
	Fall Time	$t_f$		—	3	—	
Peak Sensitivity Wavelength		$\lambda_P$	—	—	870	—	nm
Half Value Angle		$\theta_{\frac{1}{2}}$	—	—	$\pm 30$	—	°

Note 1.  $I_L$  Classification AB : 14~60 $\mu A$ , BC : 24~105 $\mu A$ , A : 14~35 $\mu A$ , B : 24~60 $\mu A$ ,  
C : 42~105 $\mu A$

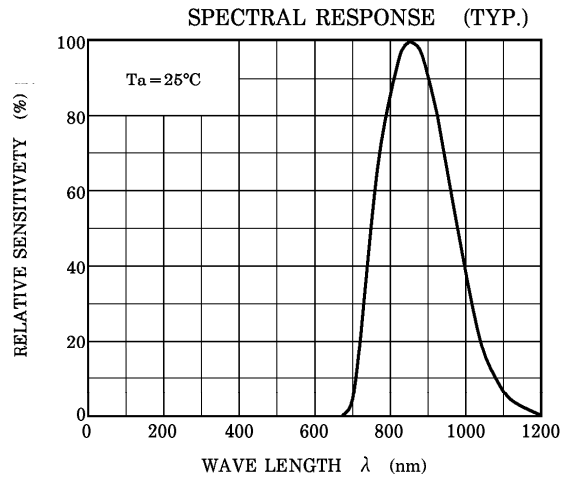
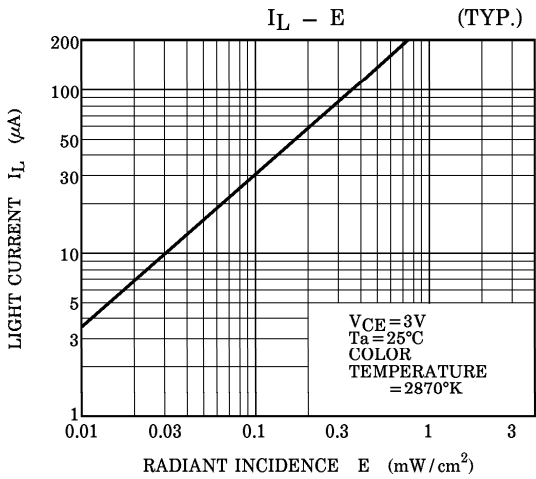
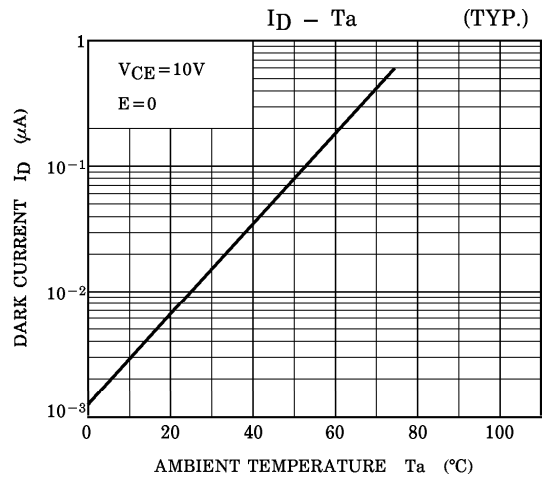
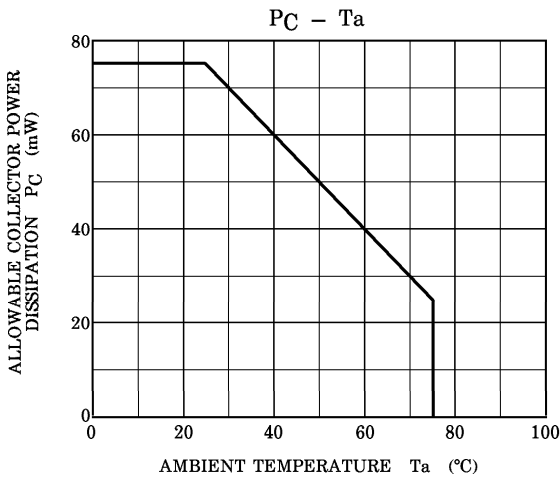
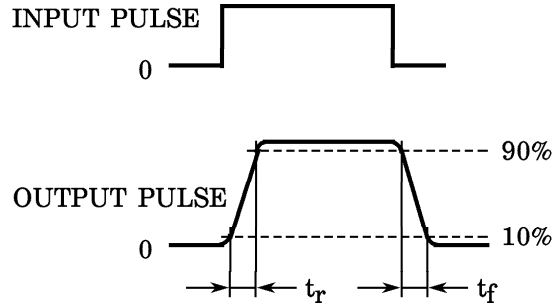
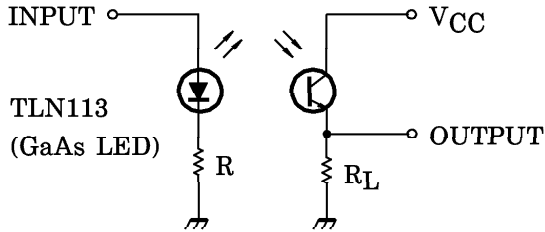
Note 2. Color temperature = 2870°K, Standard Tungsten Lamp.

## PRECAUTION

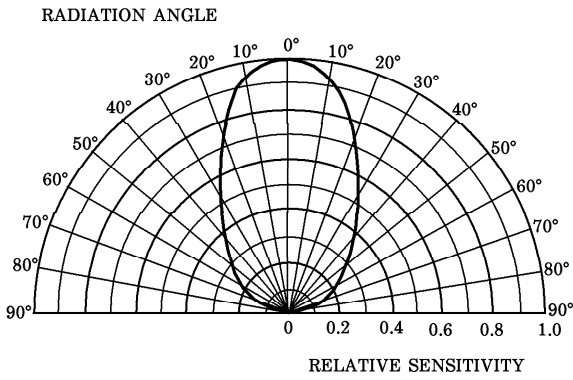
Please be careful of the followings.

- Soldering temperature : 260°C MAX. Soldering time : 3s MAX.  
(Soldering portion of lead : above 1.5mm from the body of the device)
- If the lead is formed, the lead should be formed at a distance of 2mm from the body of the device.  
Soldering shall be performed after lead forming.

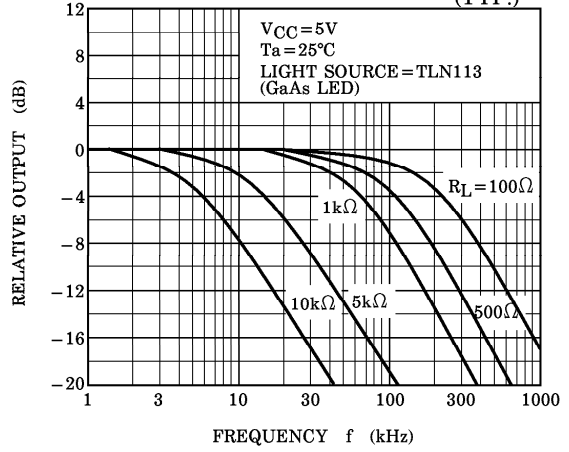
Fig. 1 SWITCHING TIME TEST CIRCUIT



DIRECTIONAL SENSITIVITY CHARACTERISTIC (TYP.)  
( $T_a = 25^\circ\text{C}$ )



FREQUENCY CHARACTERISTICS (TYP.)



SWITCHING CHARACTERISTICS (TYP.)

