

TOSHIBA PHOTO TRANSISTOR SILICON NPN EPITAXIAL PLANAR

# TPS612

FOR PHOTO SENSOR

PHOTOELECTRIC COUNTER

FLOPPY DISK DRIVE

POSITION DETECTION

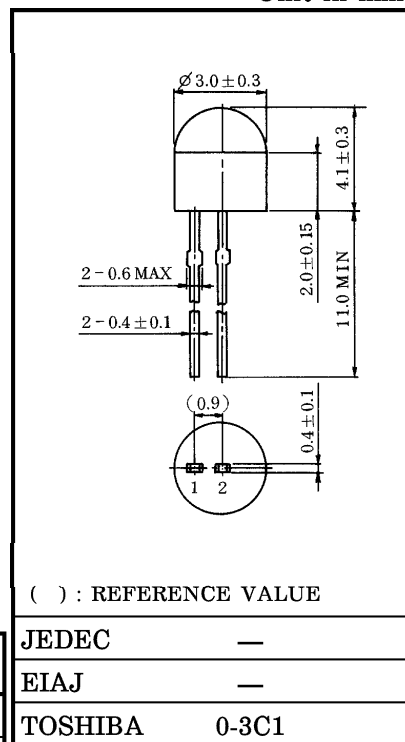
CONTROLLER OF HOME ELECTRIC EQUIPMENT

- $\phi 3\text{mm}$  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.

MAXIMUM RATINGS ( $T_a = 25^\circ\text{C}$ )

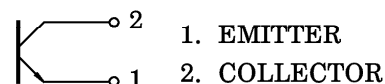
CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Emitter Voltage	$V_{CEO}$	20	V
Emitter-Collector Voltage	$V_{ECO}$	5	V
Collector Current	$I_C$	20	mA
Collector Power Dissipation	$P_C$	75	mW
Collector Power Dissipation Derating ( $T_a > 25^\circ\text{C}$ )	$\Delta P_C / ^\circ\text{C}$	-1	mW / $^\circ\text{C}$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

Unit in mm



Weight : 0.08g (TYP.)

PIN CONNECTION



961001EAA2

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## 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 $\mu A$

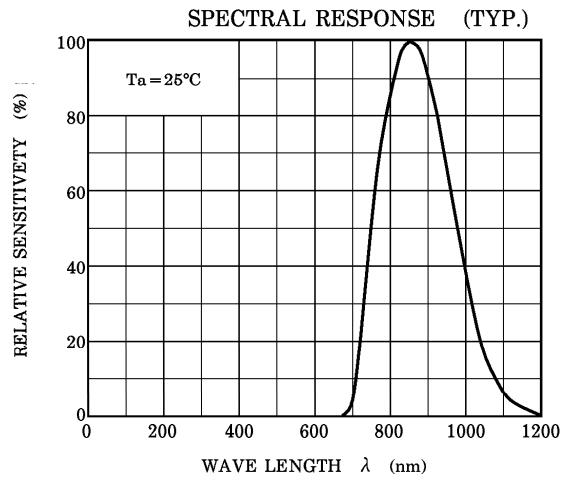
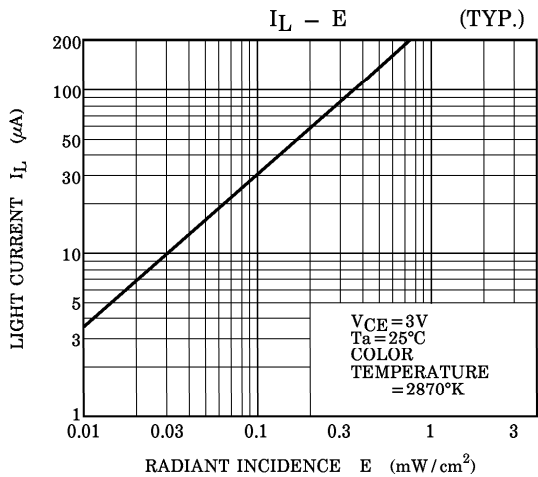
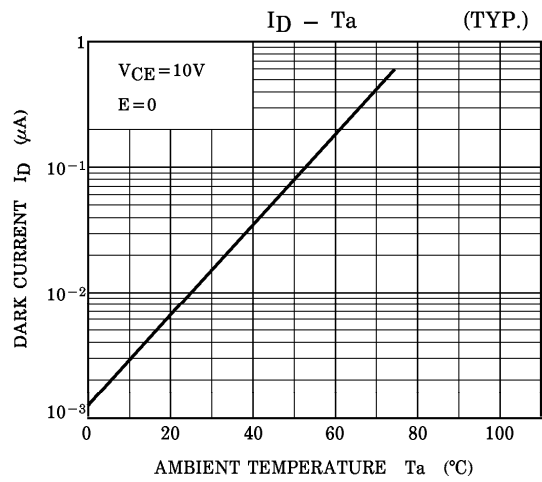
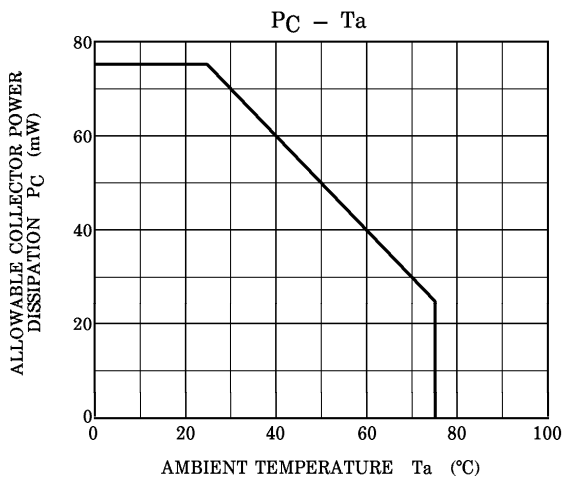
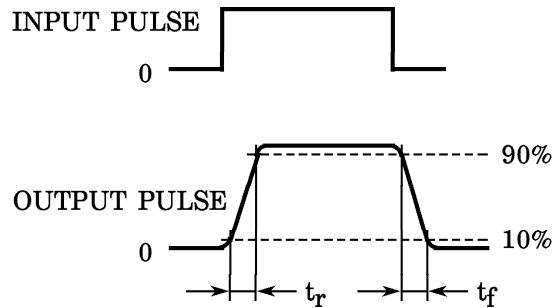
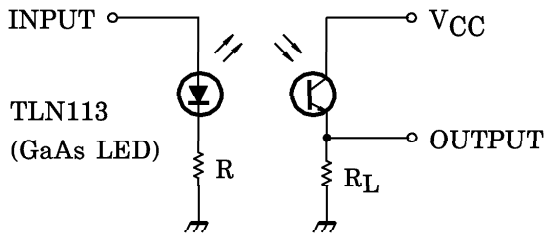
Note 2. Color temperature = 2870°K, Standard Tungsten Lamp.

## PRECAUTION

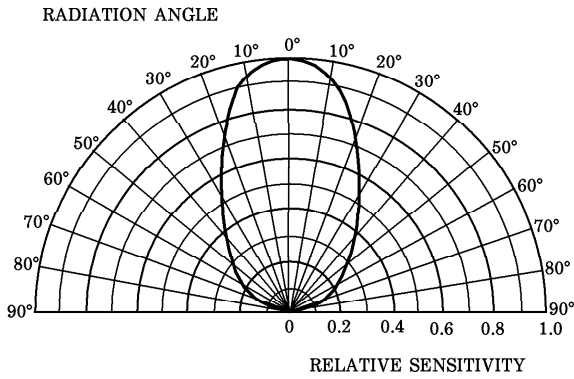
Please be careful of the followings.

- 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.

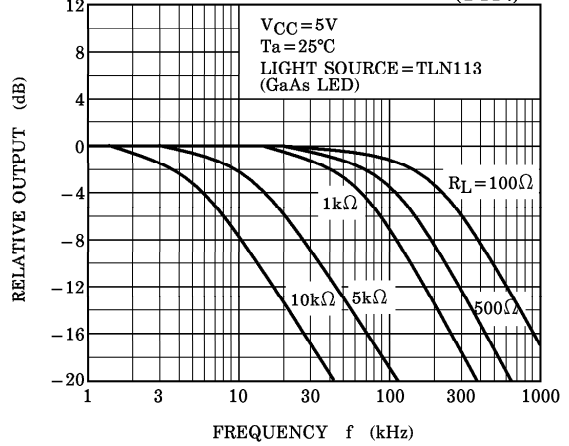
Fig. 1 SWITCHING TIME TEST CIRCUIT



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



**FREQUENCY CHARACTERISTICS (TYP.)**



**SWITCHING CHARACTERISTICS (TYP.)**

