

TOSHIBA PHOTO TRANSISTOR SILICON NPN EPITAXIAL PLANAR

# TPS614

FOR PHOTO SENSOR

PHOTOELECTRIC COUNTER

VARIOUS KINDS OF READERS

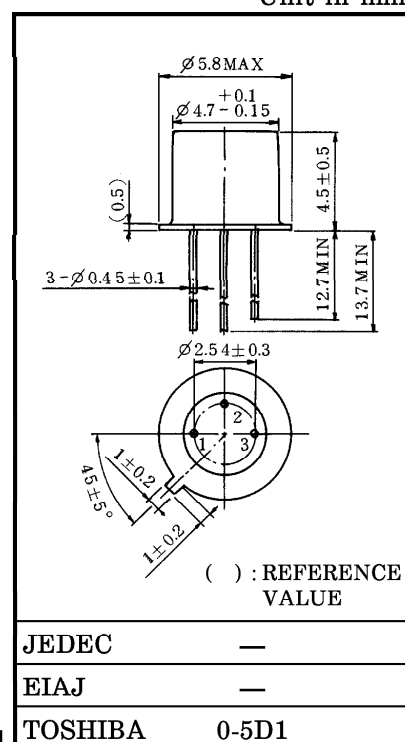
POSITION DETECTION

- TO-18 metal package
- High sensitivity :  $I_L = 1.5\text{mA}$  (TYP.)
- Wide half value angle facilitates mechanical design.  
:  $\theta_{\frac{1}{2}} = \pm 42^\circ$  (TYP.)
- Countermeasure against disturbance light, improvement of response speed and enable operation can be taken by use of the base pin. Avoid the use of TPS614 with the base pin kept open.
- TLN108, TLN201, etc. are available as the recommended infrared LEDs.

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

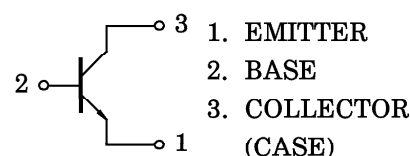
CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Emitter Voltage	$V_{CEO}$	40	V
Emitter-Collector Voltage	$V_{ECO}$	5	V
Collector Current	$I_C$	50	mA
Collector Power Dissipation	$P_C$	150	mW
Collector Power Dissipation Derating ( $T_a > 25^\circ\text{C}$ )	$\Delta P_C / ^\circ\text{C}$	-1.2	mW / $^\circ\text{C}$
Operating Temperature Range	$T_{opr}$	$-40 \sim 125$	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	$-55 \sim 150$	$^\circ\text{C}$

Unit in mm



Weight : 0.27g (TYP.)

PIN CONNECTION



961001EAA2

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

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Dark Current		$I_D (I_{CEO})$	$V_{CE} = 30V, E = 0$	—	0.01	0.2	$\mu A$
Light Current		$I_L$	$V_{CE} = 3V, E = 10mW / cm^2$ (Note)	0.6	1.5	—	mA
Collector-Emitter Saturation Voltage		$V_{CE} (sat)$	$I_C = 0.3mA, E = 10mW / cm^2$ (Note)	—	0.25	0.4	V
Switching Time	Rise Time	$t_r$	$V_{CC} = 5V, I_C = 10mA$ $R_L = 100\Omega$ (Fig. 1)	—	2	—	$\mu s$
	Fall Time	$t_f$		—	2	—	
Peak Sensitivity Wavelength		$\lambda_P$	—	—	800	—	nm
Half Value Angle		$\theta_{\frac{1}{2}}$	—	—	$\pm 42$	—	°

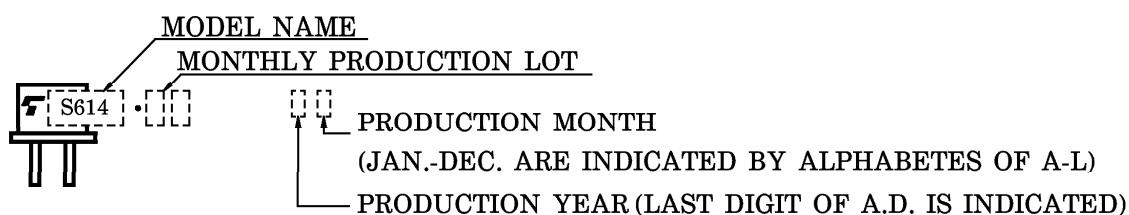
Note : Color temperature = 2870°K, Standard Tungsten Lamp.

## PRECAUTION

Please be careful of the followings.

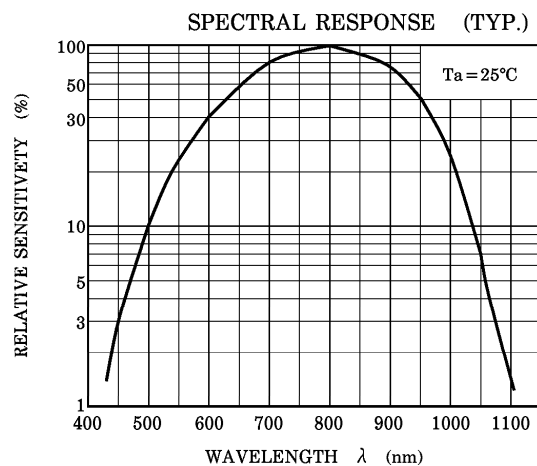
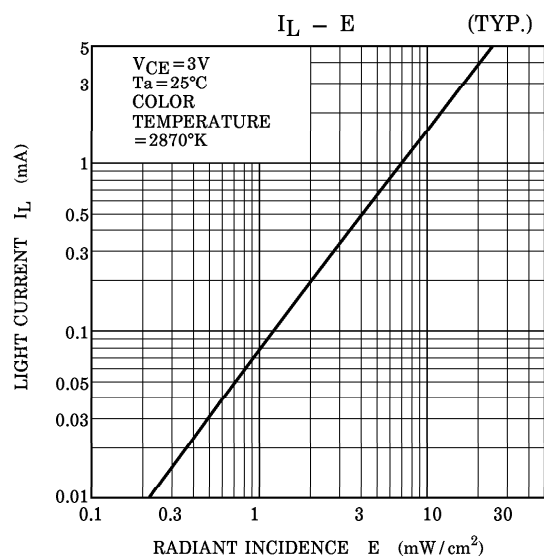
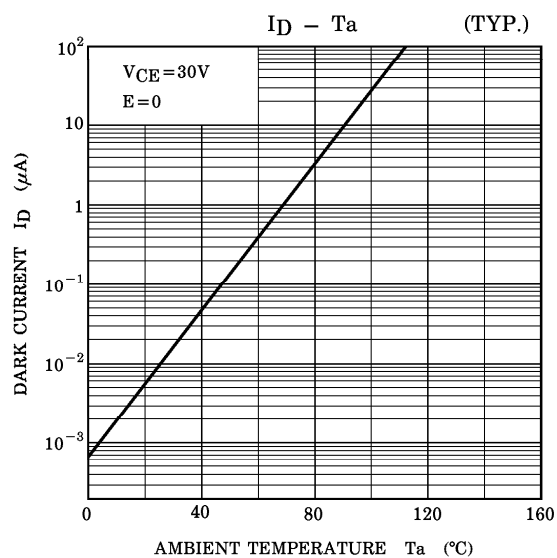
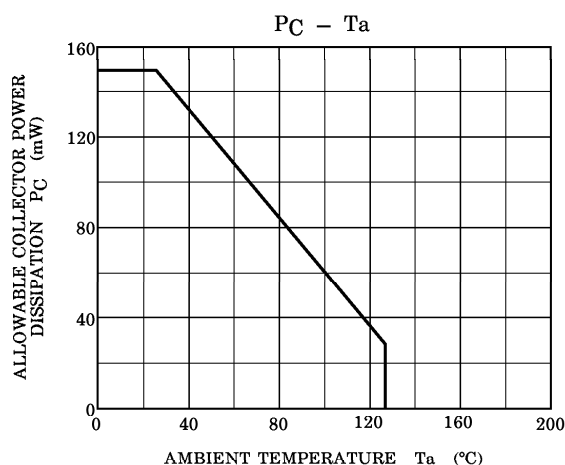
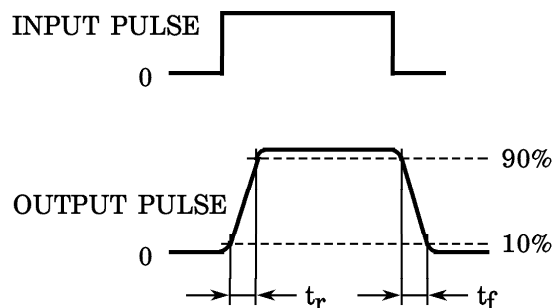
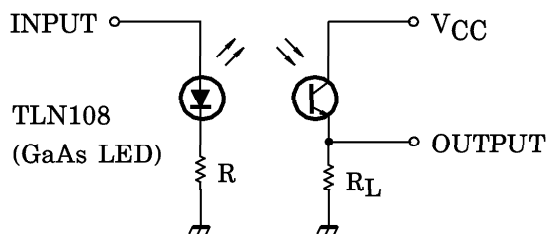
1. Soldering temperature : 260°C MAX. Soldering time : 5s MAX.  
(Soldering portion of lead : above 1.5mm from the body of the device)
2. If the lead is formed, the lead should be formed at a distance of 2mm from the body of the device.  
Soldering shall be performed after lead forming.

## PRODUCT INDICATION

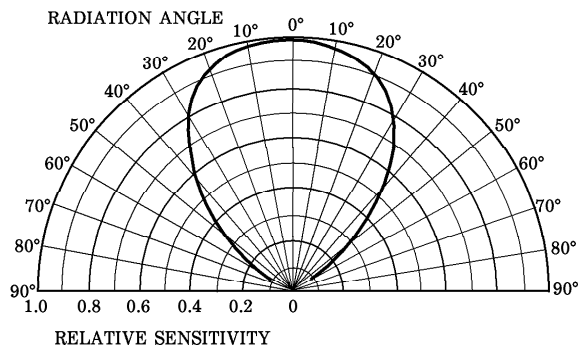


STAMP COLOR : RED

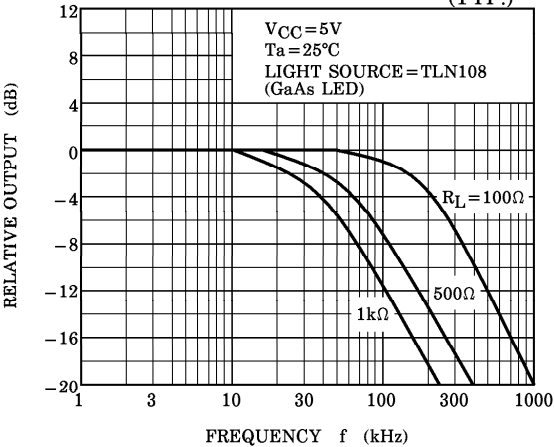
Fig. 1 SWITCHING TIME TEST CIRCUIT



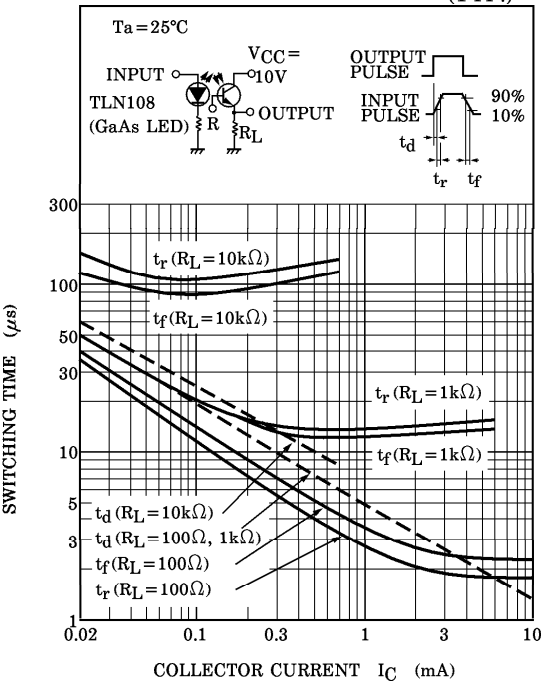
**DIRECTIONAL SENSITIVITY CHARACTERISTIC**  
(TYP.)  
( $T_a = 25^\circ\text{C}$ )



**FREQUENCY CHARACTERISTICS**  
(TYP.)



**SWITCHING CHARACTERISTICS**  
(TYP.)



**RELATIVE  $I_L$  -  $T_a$**  (TYP.)

