

TOSHIBA PHOTO TRANSISTOR SILICON NPN EPITAXIAL PLANAR

TPS614

FOR PHOTO SENSOR

PHOTOELECTRIC COUNTER

VARIOUS KINDS OF READERS

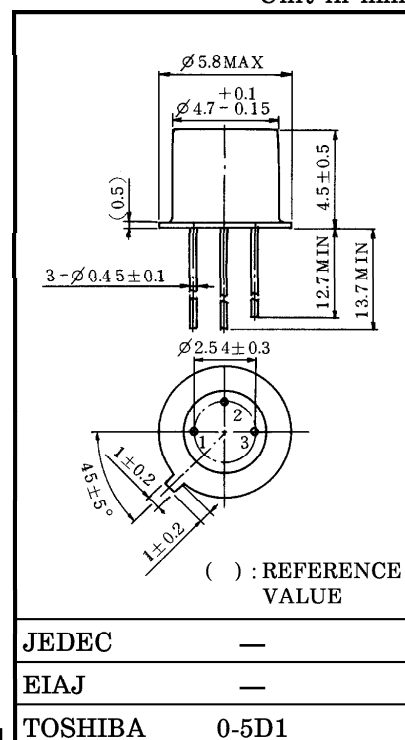
POSITION DETECTION

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

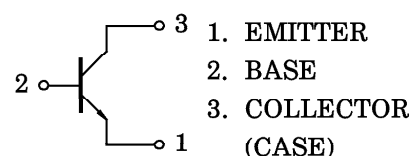
CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Emitter Voltage	V_{CEO}	40	V
Emitter-Collector Voltage	V_{ECO}	5	V
Collector Current	I_C	50	mA
Collector Power Dissipation	P_C	150	mW
Collector Power Dissipation Derating ($T_a > 25^\circ\text{C}$)	$\Delta P_C / ^\circ\text{C}$	-1.2	mW / $^\circ\text{C}$
Operating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

- 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		$I_D (I_{CEO})$	$V_{CE} = 30V, E = 0$	—	0.01	0.2	μA
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	—	μs
	Fall Time	t_f		—	2	—	
Peak Sensitivity Wavelength		λ_P	—	—	800	—	nm
Half Value Angle		$\theta_{\frac{1}{2}}$	—	—	± 42	—	°

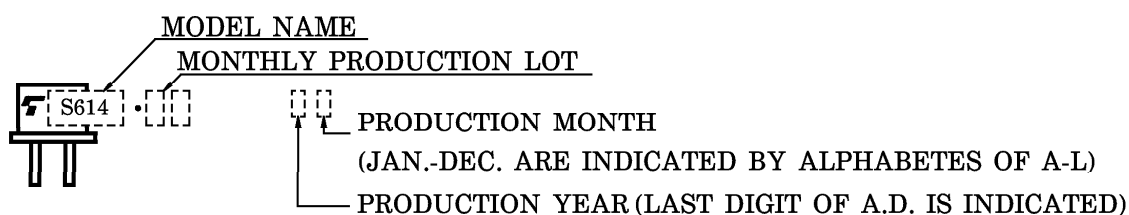
Note : Color temperature = 2870°K, Standard Tungsten Lamp.

PRECAUTION

Please be careful of the followings.

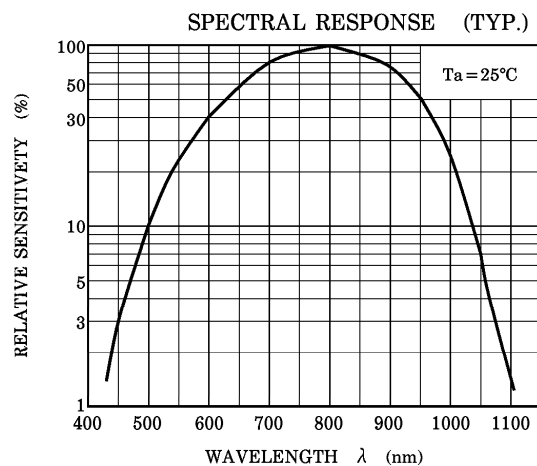
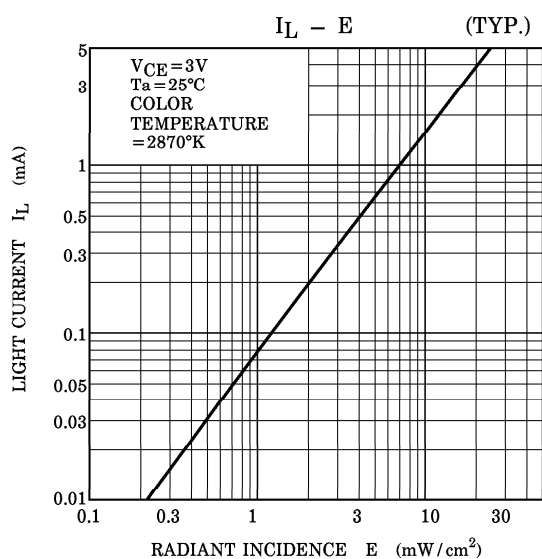
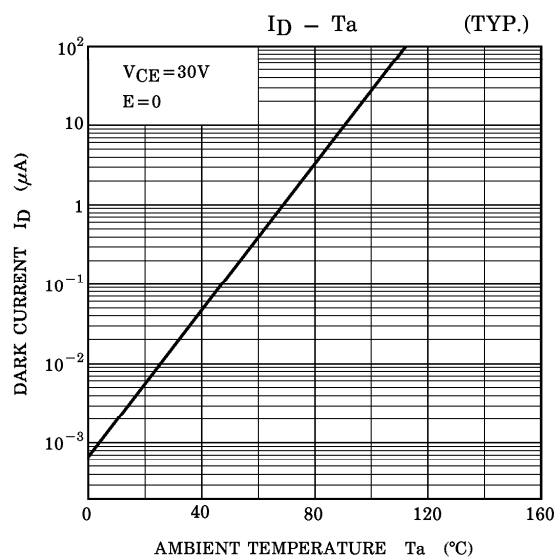
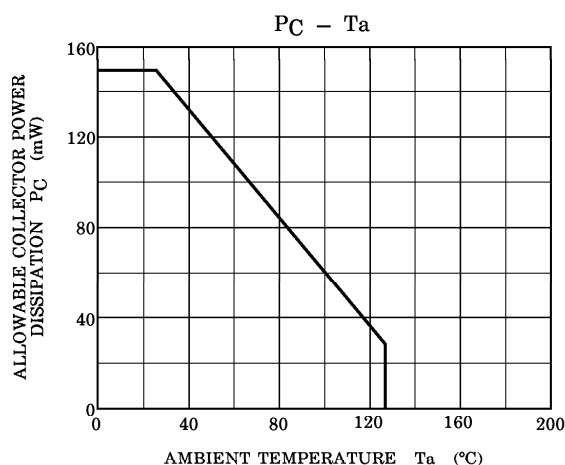
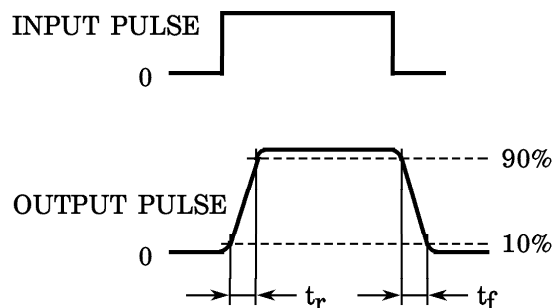
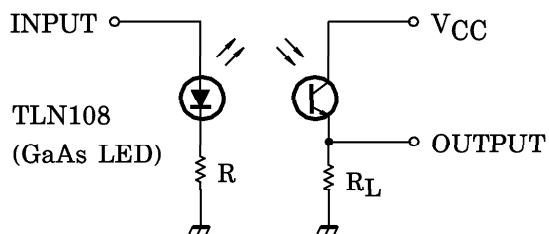
1. Soldering temperature : 260°C MAX. Soldering time : 5s MAX.
(Soldering portion of lead : above 1.5mm from the body of the device)
2. If the lead is formed, the lead should be formed at a distance of 2mm from the body of the device.
Soldering shall be performed after lead forming.

PRODUCT INDICATION

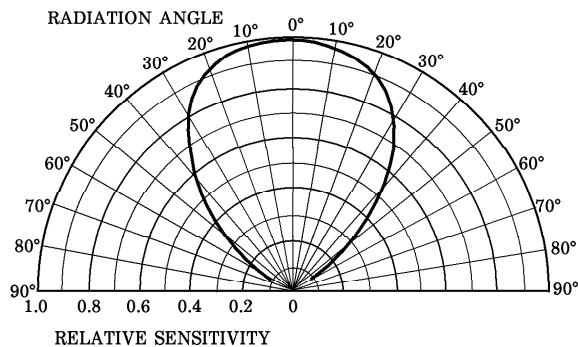


STAMP COLOR : RED

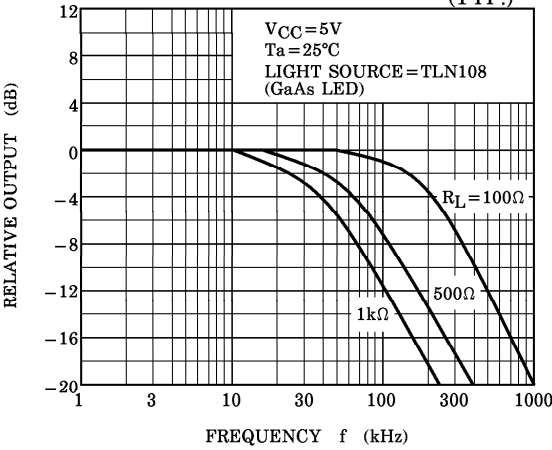
Fig. 1 SWITCHING TIME TEST CIRCUIT



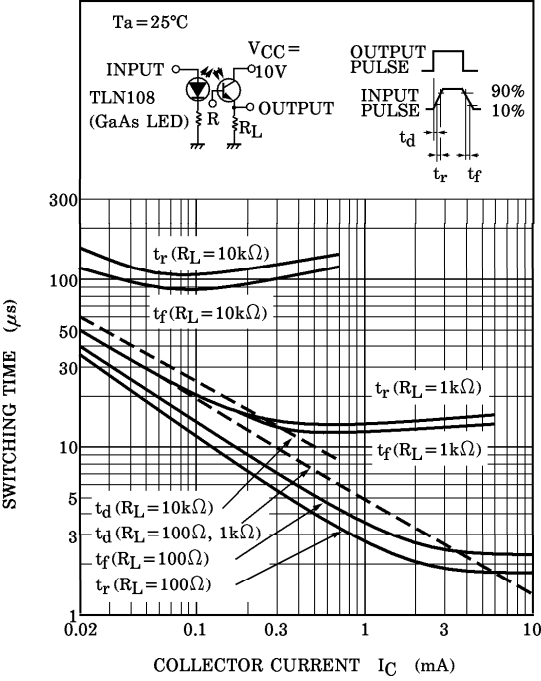
DIRECTIONAL SENSITIVITY CHARACTERISTIC
(TYP.)
($T_a = 25^\circ\text{C}$)



FREQUENCY CHARACTERISTICS
(TYP.)



SWITCHING CHARACTERISTICS
(TYP.)



RELATIVE I_L - T_a (TYP.)

