

TOSHIBA PHOTO TRANSISTOR SILICON NPN EPITAXIAL PLANAR

TPS611

FOR PHOTO SENSOR

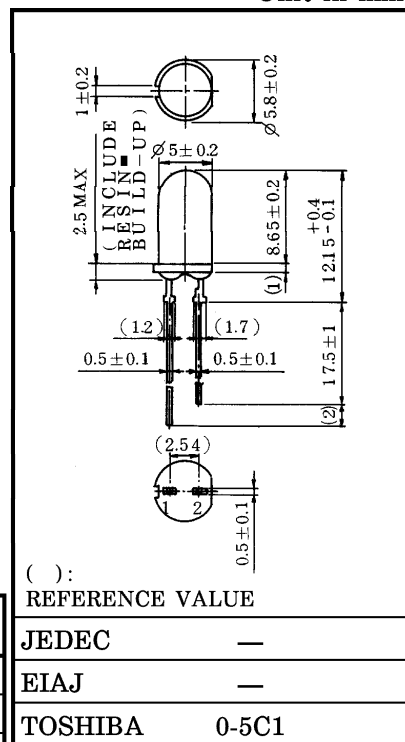
Unit in mm

PHOTOELECTRIC COUNTER
 VARIOUS KINDS OF READERS
 POSITION DETECTION

- $\phi 5\text{mm}$ epoxy resin package (black)
- High sensitivity : $I_L = 120\mu\text{A}$ (TYP.)
- Half value angle : $\theta_{\frac{1}{2}} = \pm 8^\circ$ (TYP.)
- The TLN110 in the same size and TLN205 in the similar external size are available as infrared LEDs.
- Protected from external light by black mold packaging.

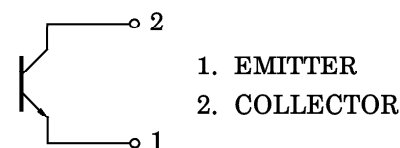
MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Emitter Voltage	V_{CEO}	30	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 ($T_a > 25^\circ\text{C}$)	$\Delta P_C / ^\circ\text{C}$	-2	mW / $^\circ\text{C}$
Operating Temperature Range	T_{opr}	-20~75	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	-30~100	$^\circ\text{C}$



Weight : 0.3g (TYP.)

PIN CONNECTION



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

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Dark Current	$I_D (I_{CEO})$	$I_F = 24\text{V}, E = 0$	—	0.005	0.1	μA
Light Current	I_L	$V_{CE} = 3\text{V}, E = 0.1\text{mW}/\text{cm}^2$ (Note)	30	120	—	μA
Collector-Emitter Saturation Voltage	$V_{CE}(\text{sat})$	$I_C = 15\mu\text{A}, E = 0.1\text{mW}/\text{cm}^2$ (Note)	—	0.25	0.4	V
Switching Time	Rise Time	$V_{CC} = 5\text{V}, I_C = 2\text{mA}$ $R_L = 100\Omega$	—	6	—	μs
	Fall Time		—	6	—	
Peak Sensitivity Wavelength	λ_P	—	—	900	—	nm
Half Value Angle	$\theta_{\frac{1}{2}}$	—	—	± 8	—	$^\circ$

(Note) Color temperature = 2870°K, Standard Tungsten Lamp

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PRECAUTION

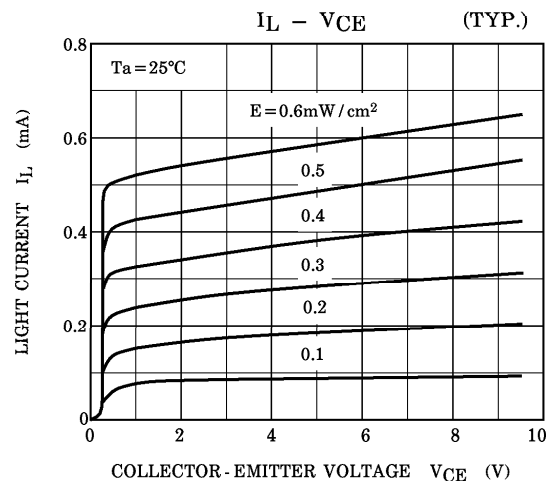
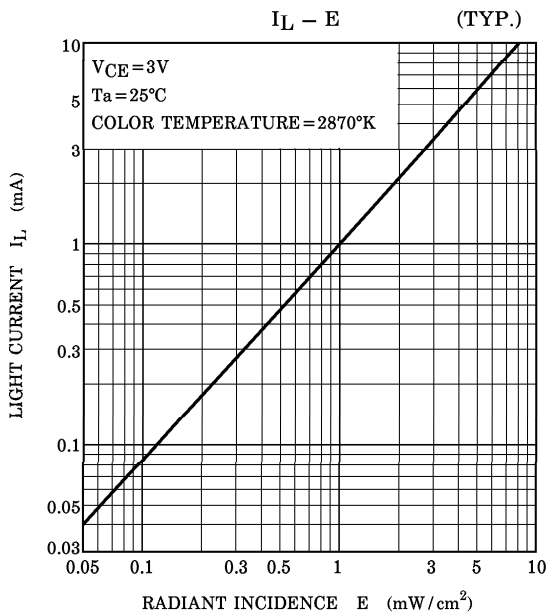
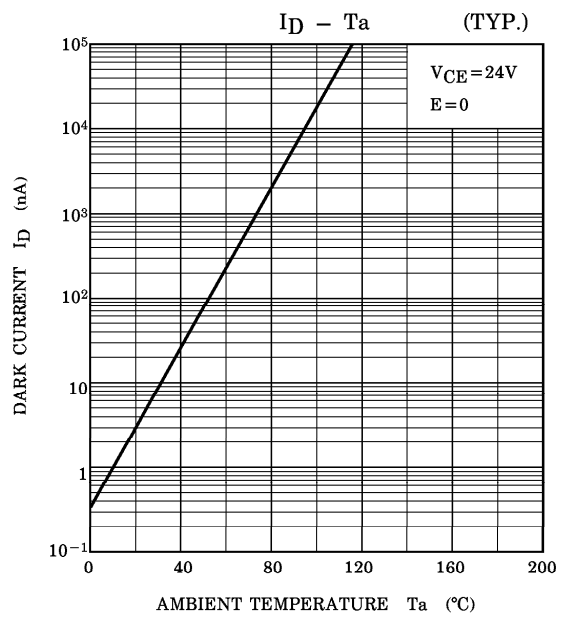
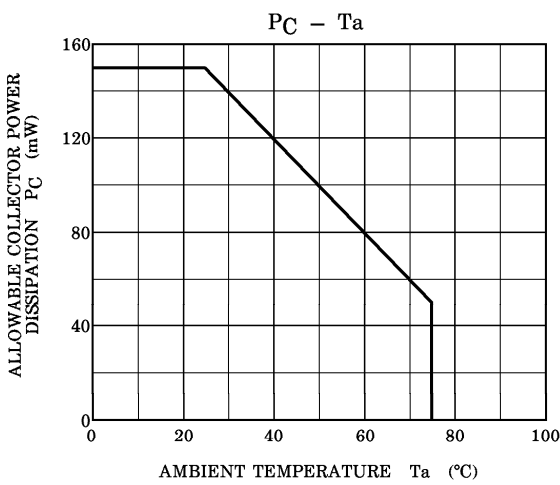
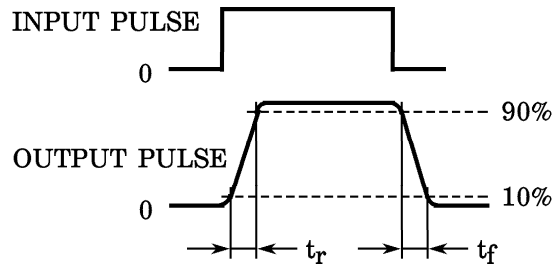
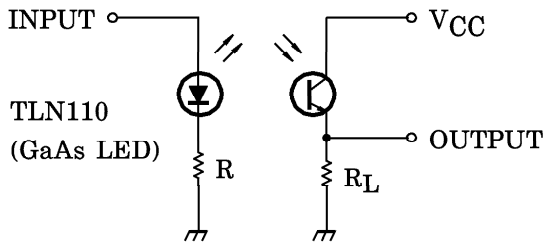
Please be careful of the followings.

1. Soldering temperature : 260°C MAX. Soldering time : 5s MAX.
(Soldering portion of lead : The top portion from the lead stopper.)
2. When the lead is formed, the lead shall be formed at the top portion of the stopper without leaving forming stress to the body of the device. Soldering shall be performed after lead forming.

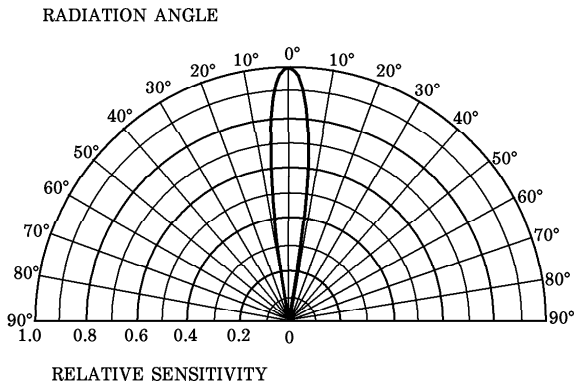
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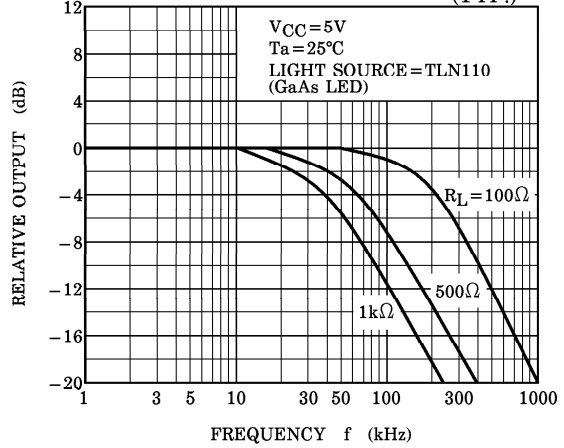
Fig.1 SWITCHING TIME TEST CIRCUIT



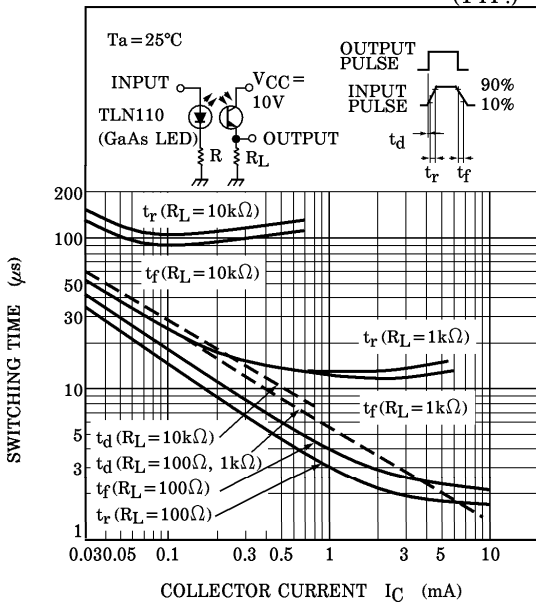
DIRECTIONAL SENSITIVITY CHARACTERISTIC (TYP.)
($T_a = 25^\circ\text{C}$)



FREQUENCY CHARACTERISTICS (TYP.)



SWITCHING CHARACTERISTICS (TYP.)



COUPLING CHARACTERISTICS WITH TLN110

