TOSHIBA Phototransistor Silicon NPN Epitaxial Planar

TPS611(F)

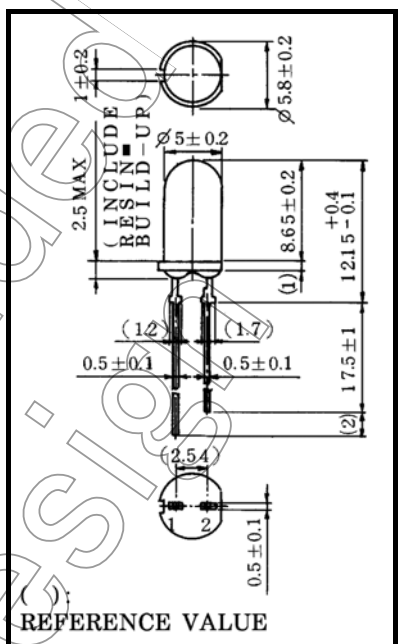
Photoelectric Counter

Various Kinds Of Readers

Position Detection

- φ5mm epoxy resin package(black)
- High sensitivity: I_L = 120μA(typ.)
- Half value angle: θ1/2 = ±8°(typ.)
- Protected from external light by black mold packaging.

Unit in mm



TOSHIBA	0−5C1

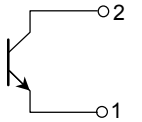
Weight: 0.3 g (typ.)

Absolute Maximum Ratings (Ta = 25°C)

Characteristics	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(Ta>25°C)	ΔP_C /°C	−2	mW/°C
Operating temperature range	T_{opr}	−20~75	°C
Storage temperature range	T_{stg}	−30~100	°C

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings.
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook (“Handling Precautions”/“Derating Concept and Methods”) and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Pin Connection



1. Emitter
2. Collector

Opto−electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition	Min	Typ.	Max	Unit
Dark current		I_D (I_{CEO})	I_F = 24V, E=0	—	0.005	0.1	μA
Light current		I_L	V_{CE} = 3V, E=0.1mW/cm^2 (Note)	30	120	—	μA
Collector−emitter saturation voltage		$V_{CE(sat)}$	I_C = 15μA, E=0.1mW/cm^2 (Note)	—	0.25	0.4	V
Switching time	Rise time	t_r	V_{CC} = 5V, I_C = 2mA R_L = 100Ω	—	6	—	μs
	Fall time	t_f		—	6	—	
Peak sensitivity wavelength		λ_P	—	—	900	—	nm
Half value angle		$\theta\frac{1}{2}$	—	—	±8	—	°

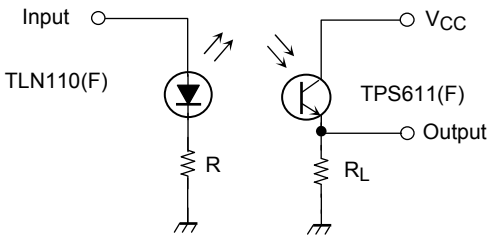
Note: Color temperature = 2870K, standard tungsten lamp

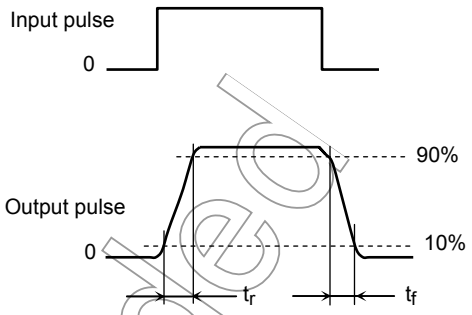
Precaution

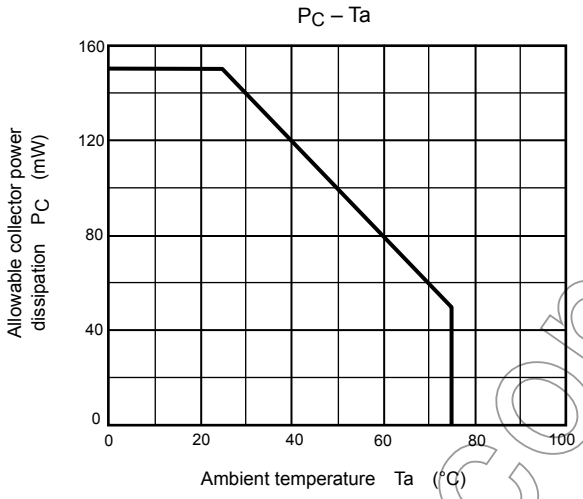
Please be careful of the followings.

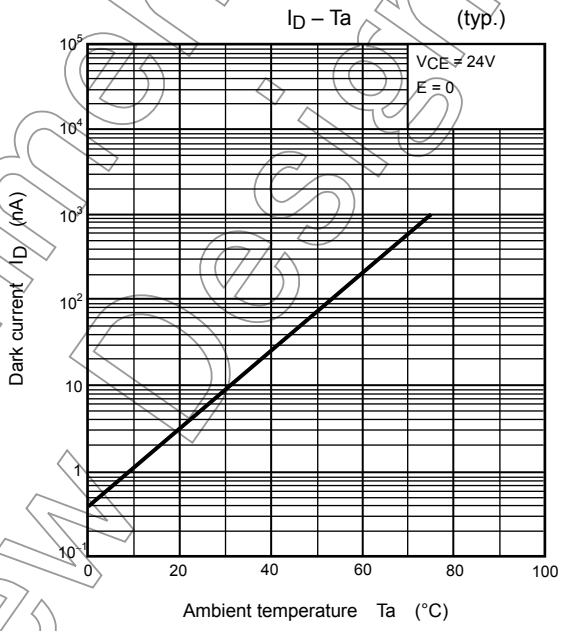
1. Soldering temperature: 260°C max. Soldering time: 5s max.
   (Soldering portion of lead: The top portion from the lead stopper.)
2. When the leads is formed, the lead shall be formed at the top portion of the stopper without leaving forming stress to the body of the device. Soldering shall be performed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

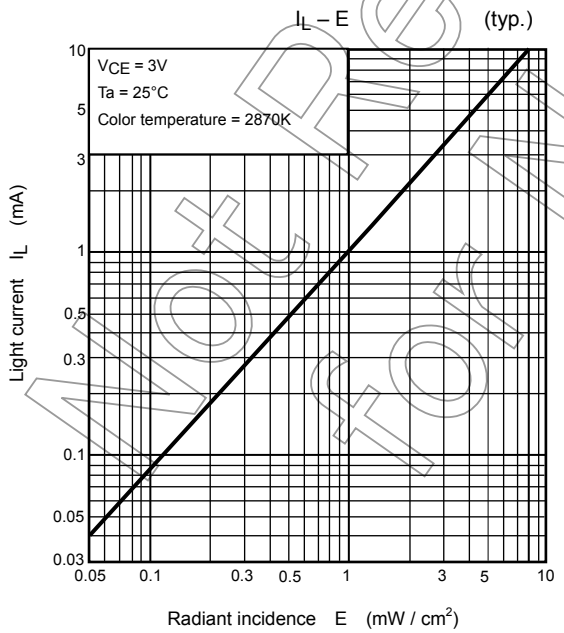
Fig.1 Switching time test circuit

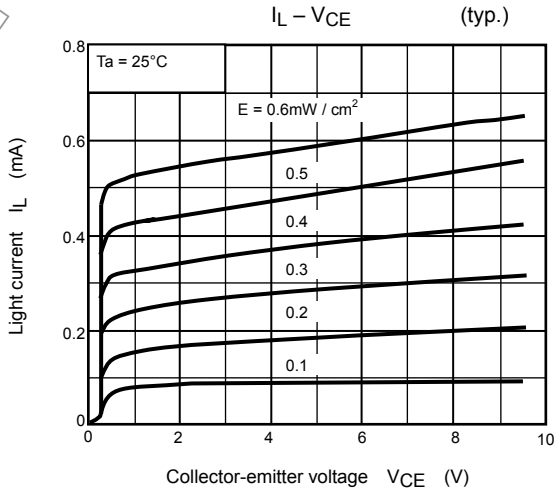






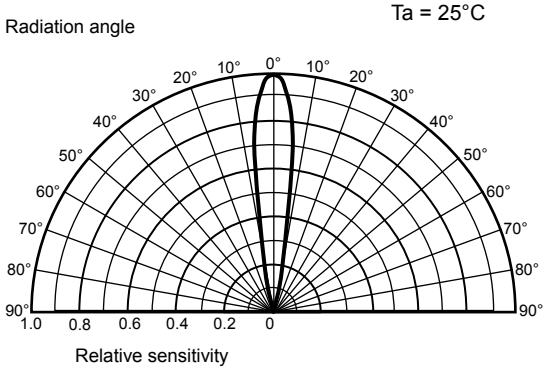




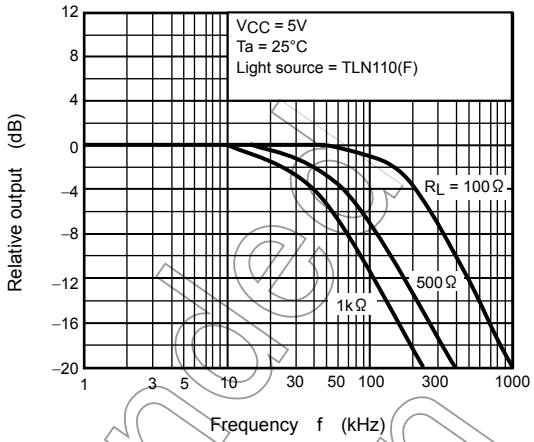


Directional Sensitivity Characteristics
(typ.)

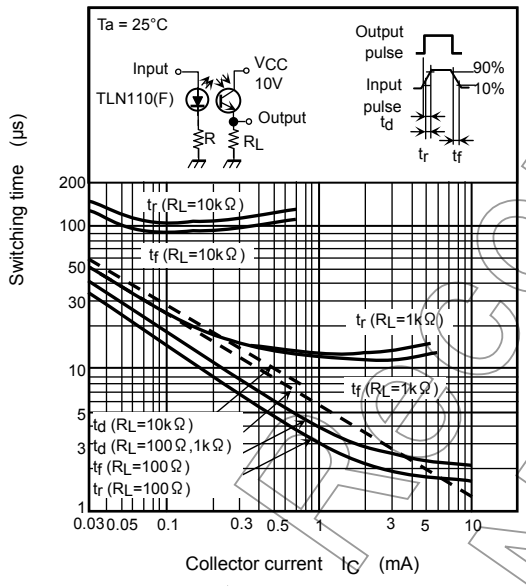
Ta = 25°C



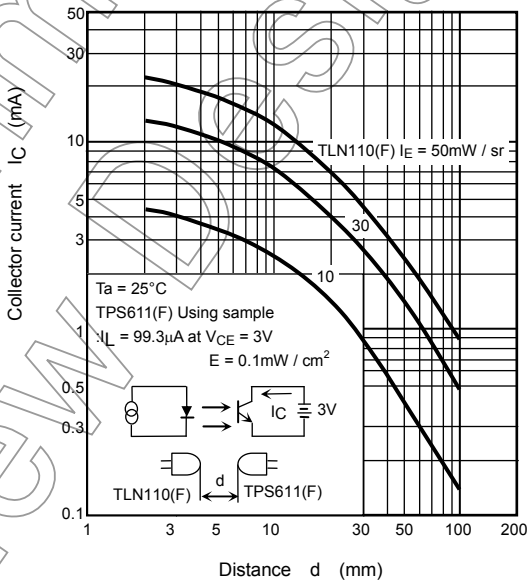
Frequency Characteristics
(typ.)



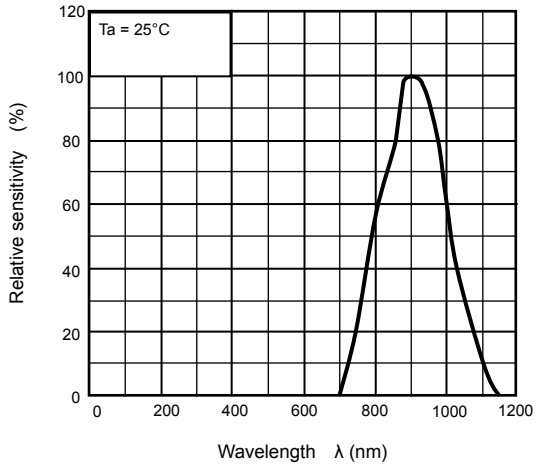
Switching Characteristics
(typ.)



Coupling Characteristics With
TLN110(F)



Spectral Response (typ.)



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