TOSHIBA Phototransistor Silicon NPN Epitaxial Planar

TPS615(F)

Floppy Disk Drive

VCR

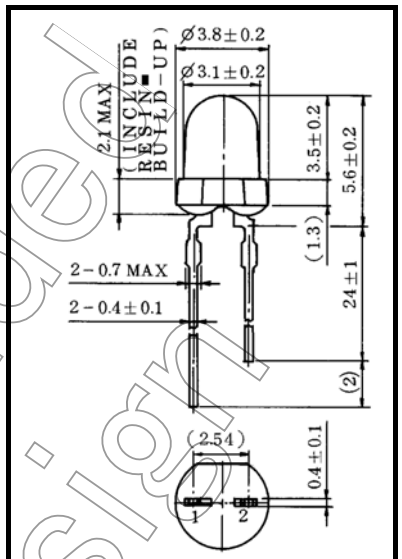
Position Detector Of Home Electric Equipment

Stroboscope

Opto−Electronic Switch

- φ3.1mm epoxy resin package
- Light current: I_L = 20μA (min.) at E = 0.1mW / cm²
- Half value angle: θ1/2 = ±30° (typ.)

Unit in mm



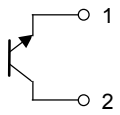
TOSHIBA 0−3D1

Weight: 0.12 g (typ.)

Absolute Maximum Ratings (Ta = 25°C)

Characteristic	Symbol	Rating	Unit
Collector−emitter voltage	V_{CEO}	30	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 (Ta > 25°C)	ΔP_C /°C	−1	mW /°C
Operating temperature range	T_{opr}	−30~85	°C
Storage temperature range	T_{stg}	−30~100	°C

Pin Connection



1. Emitter
2. Collector

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).

Opto–Electrical Characteristics (Ta = 25°C)

Characteristic		Symbol	Test Condition	Min.	Typ.	Max.	Unit
Dark current		I_D (I_{CEO})	V_{CE} = 24 V	—	0.01	0.1	μA
Light current		I_L (Note 2)	V_{CE} = 3 V, E = 0.1 mW / cm^2 (Note 1)	20	—	150	μA
Collector–emitter saturation voltage		$V_{CE\ (sat)}$	I_C = 10 μA, E = 0.1 mW / cm^2 (Note 1)	—	0.2	0.4	V
Peak Sensitivity wavelength		λ_P	—	—	800	—	nm
Half value angle		$\theta\frac{1}{2}$	—	—	±30	—	°
Switching time	Rise time	t_r	V_{CC} = 10 V, I_C = 1 mA R_L = 1kΩ	—	9	—	μs
	Fall time	t_f		—	10	—	

Note 1: Color temperature = 2870K standard tungsten lamp

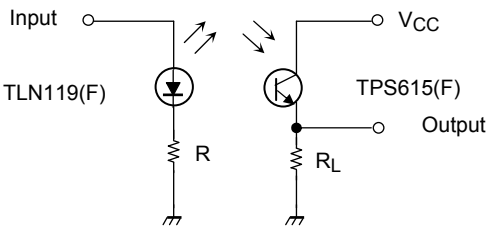
Note 2: I_L Classification A: 20~50 μA, B: 34~85 μA, C: 60~150 μA, AB: 20~85 μA, BC: 34~150μA

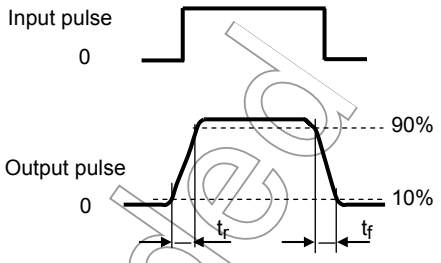
Precaution

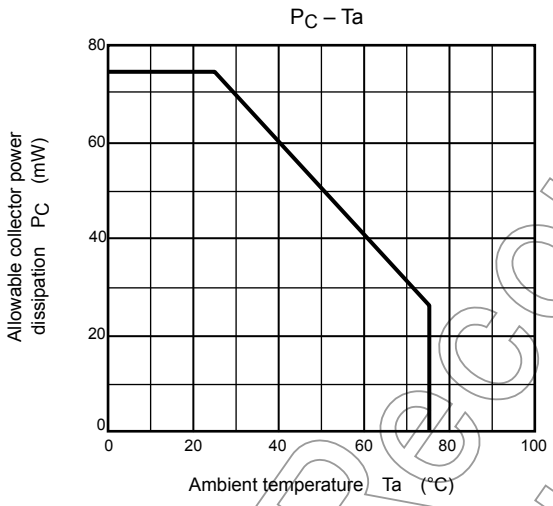
Please be careful of the followings.

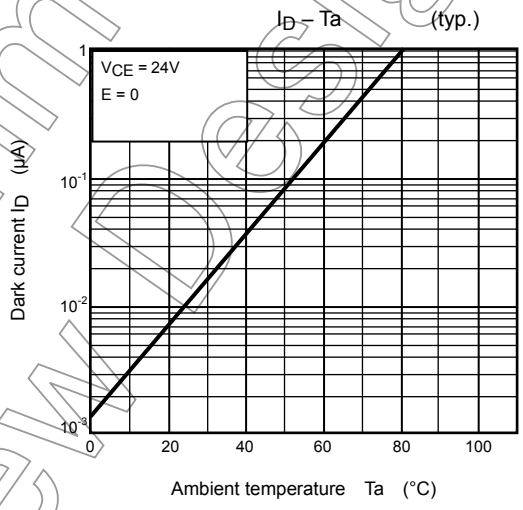
1. Soldering temperature: 260°C max.
   Soldering time: 3s max.
   (Soldering portion of lead: above 1.5mm from the body of the device)
2. If the lead is formed, the lead should be formed at a distance of 2mm from the body of the device.
   Soldering shall be performed after lead forming.

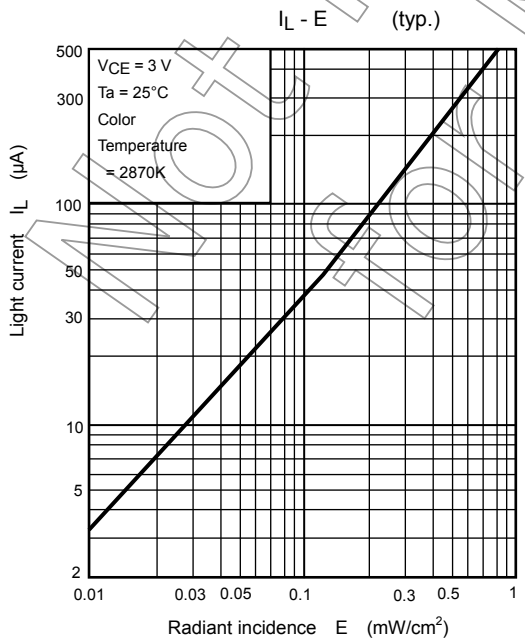
Fig. 1 Switching Time Test Circuit

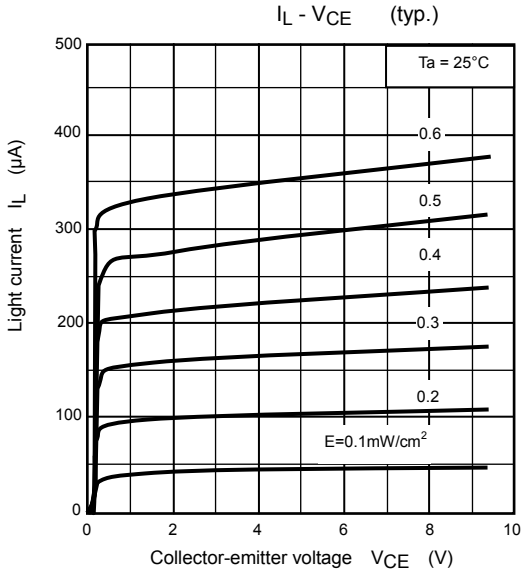




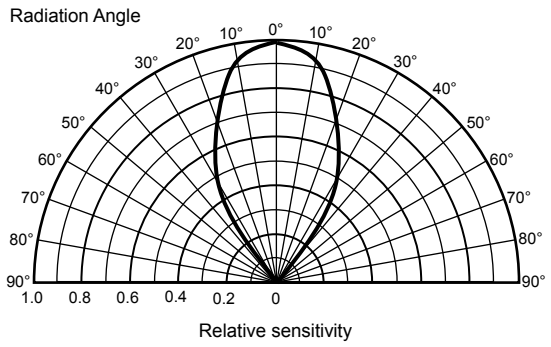




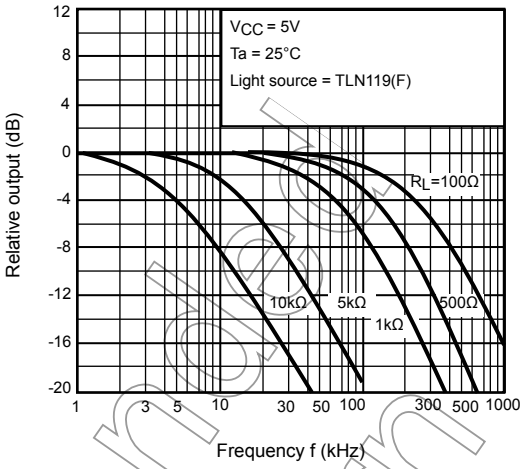




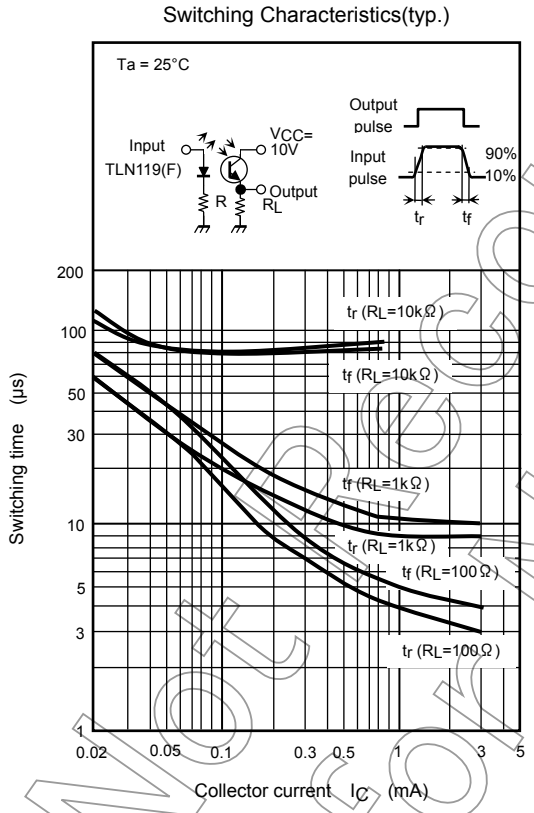
Directional Sensitivity Characteristic (typ.)
(Ta = 25°C)



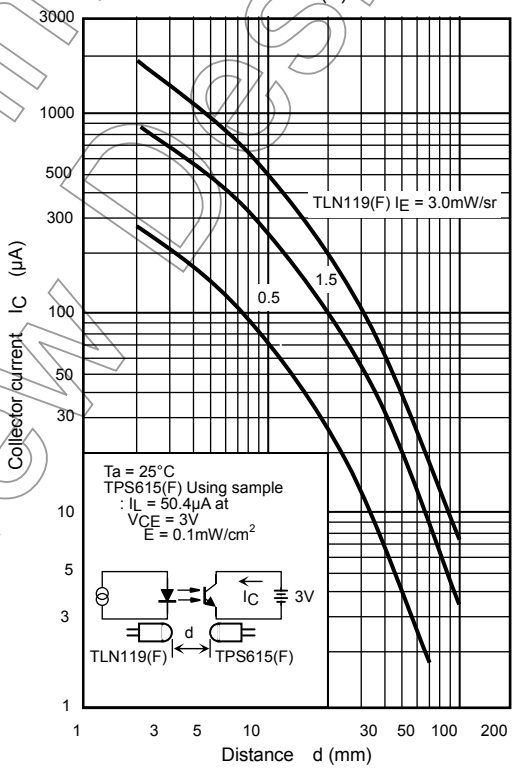
Frequency Characteristics (typ.)



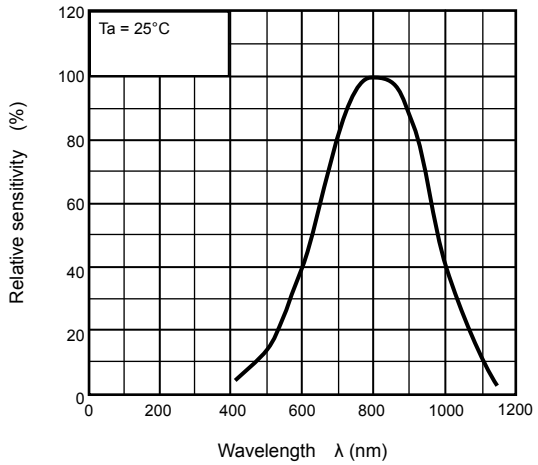
Switching Characteristics(typ.)



Coupling Characteristics With TLN119(F)



Spectral Response (typ.)



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