

TOSHIBA Phototransistor Silicon NPN Epitaxial Planar

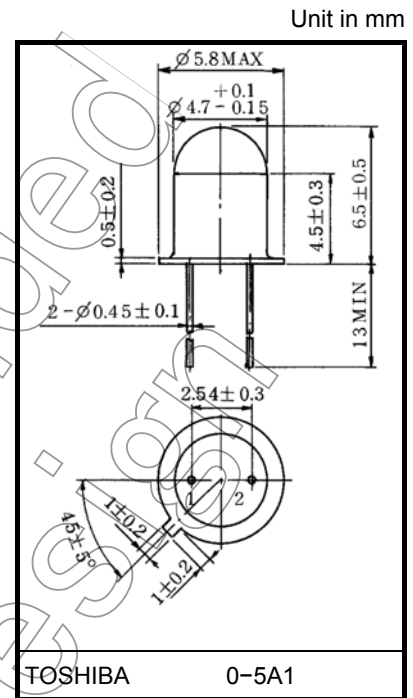
# TPS601A(F)

Photoelectric Counter  
 Position Detection  
 Various Kinds Of Readers

- TO-18 metal CAN package
- High sensitivity.
- Sharp directivity. Incident light can be effectively used.  
 :  $01/2 = \pm 10^\circ$  (typ.)

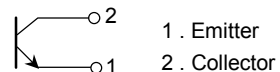
### Absolute Maximum Ratings (Ta = 25°C)

Characteristic	Symbol	Rating	Unit
Collector-emitter voltage	V <sub>CEO</sub>	40	V
Emitter-collector voltage	V <sub>ECO</sub>	5	V
Collector current	I <sub>C</sub>	50	mA
Collector power dissipation	P <sub>C</sub>	150	mW
Collector power dissipation derating (Ta > 25°C)	$\Delta P_C / ^\circ C$	-1.2	mW / °C
Operating temperature range	T <sub>opr</sub>	-40~125	°C
Storage temperature range	T <sub>stg</sub>	-55~150	°C



Weight: 0.39 g (typ.)

### Pin Connection



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		$I_D (I_{CEO})$	$V_{CE} = 30V, E = 0$	—	0.01	0.2	$\mu A$	
Light current		$I_L$	$V_{CE} = 3V$ $E = 0.1mW / cm^2$ (Note)	TPS601A (F)	100	—	—	$\mu A$
				TPS601A (A,F)	100	—	300	
				TPS601A (B,F)	200	—	600	
				TPS601A (C,F)	400	—	1200	
Collector-emitter saturation voltage		$V_{CE (sat)}$	$I_C = 30 \mu A, E = 0.1mW / cm^2$ (Note)	—	0.25	0.4	V	
Switching time	rise time	$t_r$	$V_{CC} = 5V, I_C = 10mA$ $R_L = 100\Omega$	—	2	—	$\mu s$	
	fall time	$t_f$		—	2	—		
Peak sensitivity wavelength		$\lambda_P$		—	800	—	nm	
Half value angle		$\theta \frac{1}{2}$		—	$\pm 10$	—	°	

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: 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

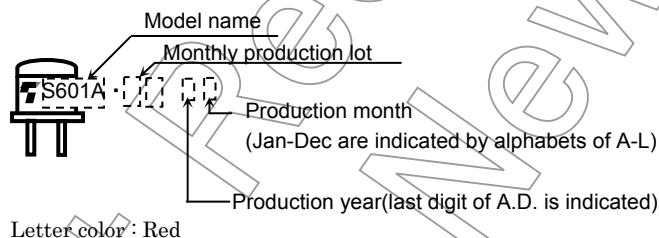
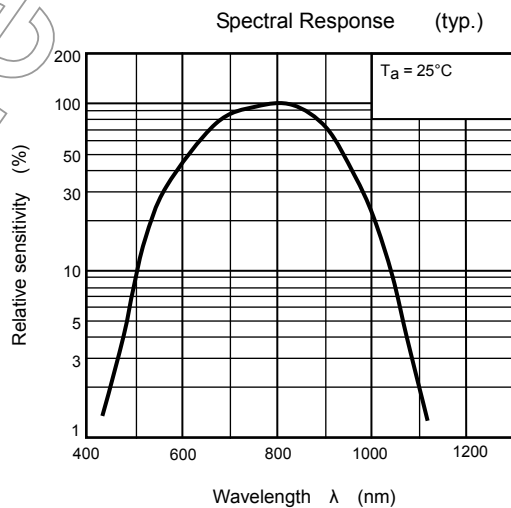
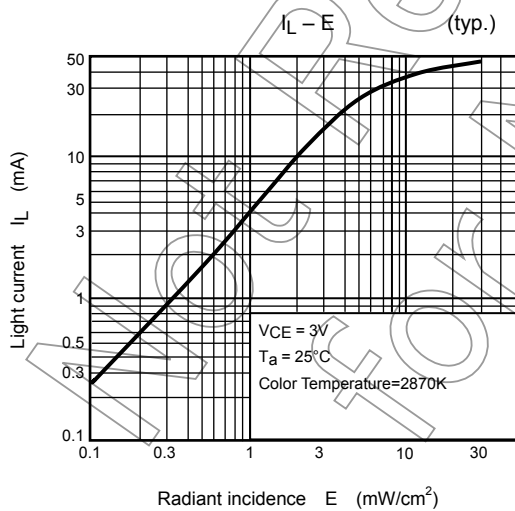
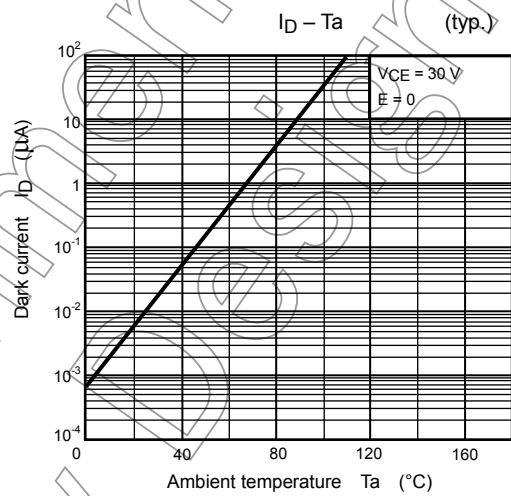
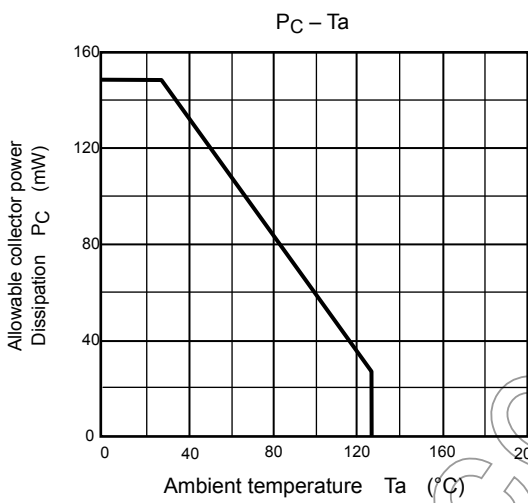
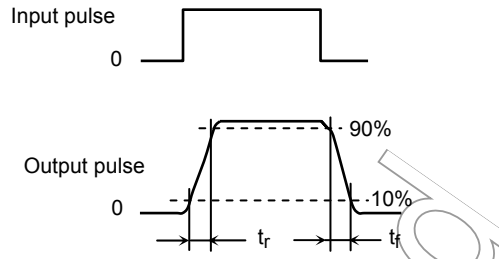
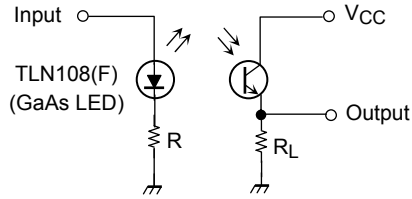
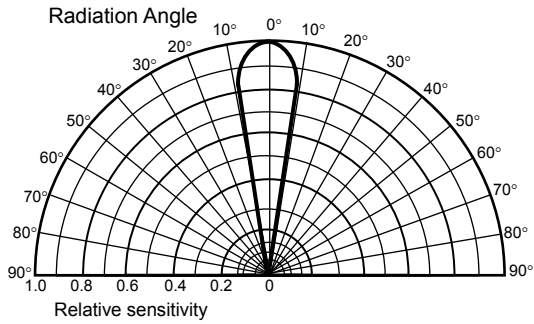


Fig.1 Switching time test circuit

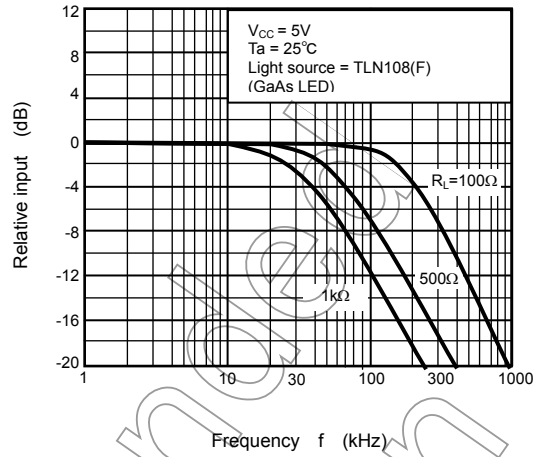


Directional Sensitivity Characteristic (typ.)

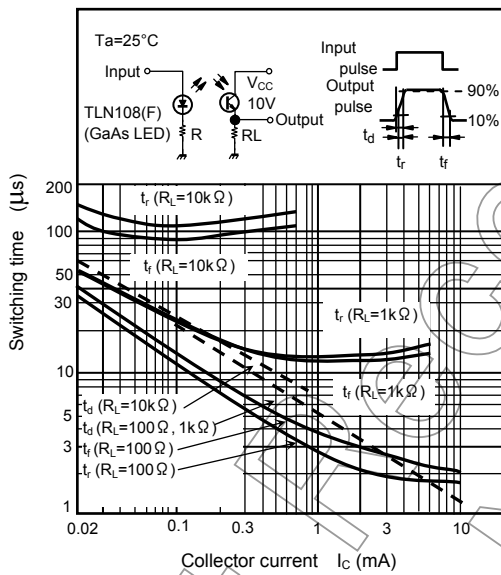
(Ta = 25°C)

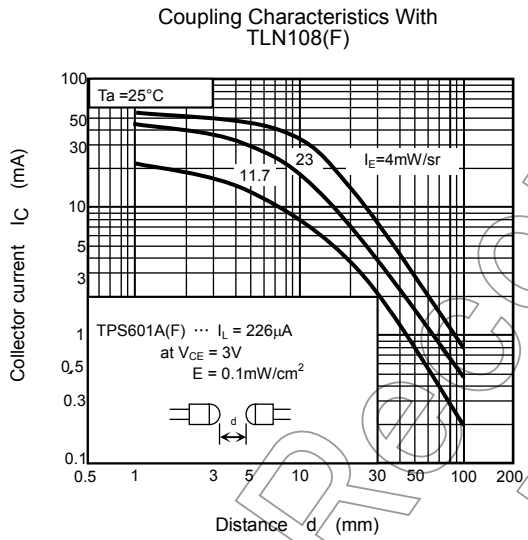
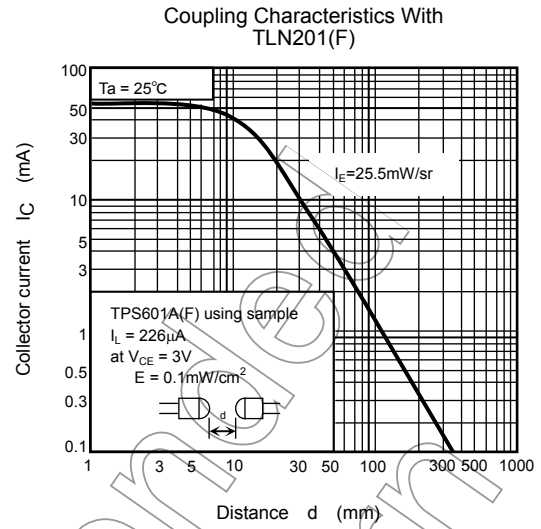
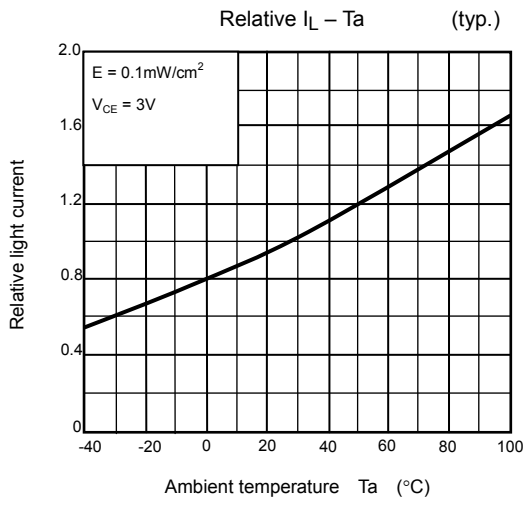


Frequency Characteristics (typ.)



Switching Characteristics (typ.)





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