

TOSHIBA Phototransistor Silicon NPN Epitaxial Planar

TPS601A(F)

Lead(Pb)-Free
 Photoelectric Counter
 Position Detection
 Various Kinds Of Readers

- TO-18 metal CAN package
- High sensitivity.
- Sharp directivity. Incident light can be effectively used.
 : $\theta_{1/2} = \pm 10^\circ$ (typ.)

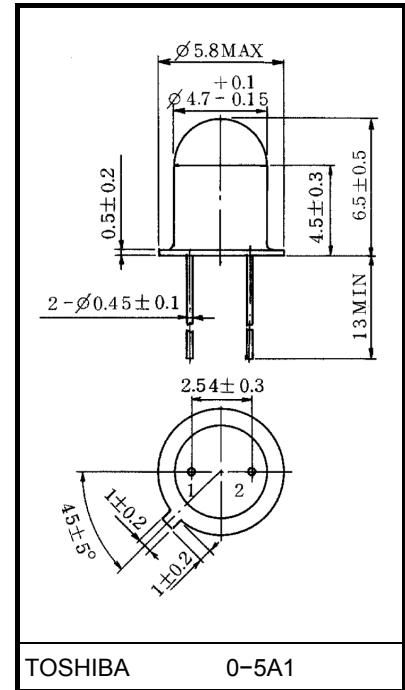
Absolute Maximum Ratings (Ta = 25°C)

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 (Ta > 25°C)	$\Delta P_C / ^\circ C$	-1.2	mW / °C
Operating temperature range	T _{opr}	-40~125	°C
Storage temperature range	T _{stg}	-55~150	°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.

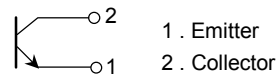
Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

Unit in mm



Weight: 0.39 g (typ.)

Pin Connection



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	$V_{CE} = 3V$ $E = 0.1mW / cm^2$ (Note)	TPS601A (F)	100	—	μA	
				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	—	μs	
	fall time	t_f		—	2	—		
Peak sensitivity wavelength		λ_P		—	800	—	nm	
Half value angle		$\theta \frac{1}{2}$		—	± 10	—	$^\circ$	

Note: Color temperature = 2870K, standard tungsten lamp.

Precaution

Please be careful of the followings.

- Soldering temperature: 260°C max.
Soldering time: 5s max.
(Soldering portion of lead: Above 1.5mm from the body of the device.)
- 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

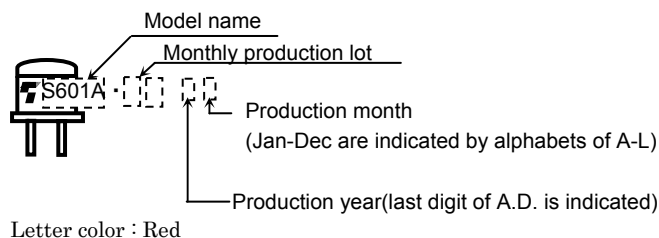
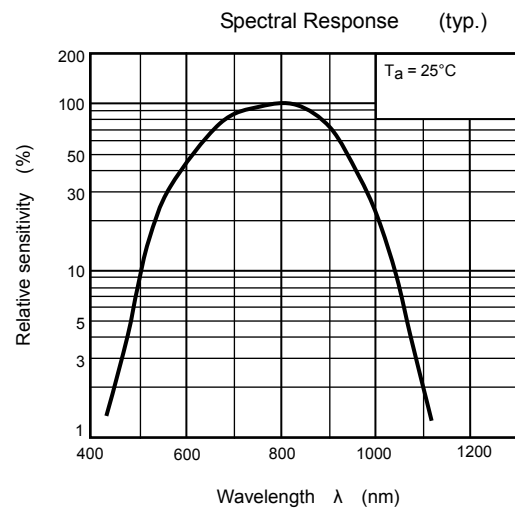
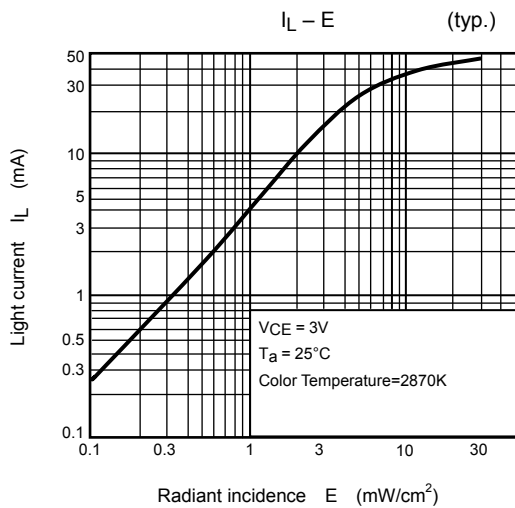
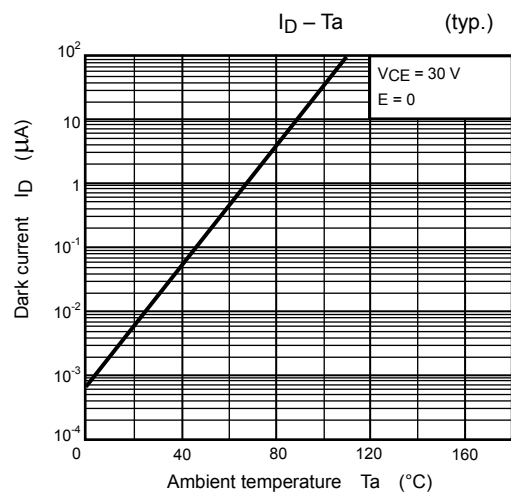
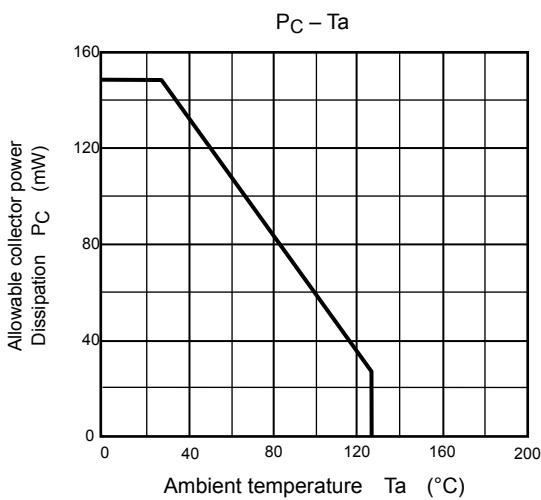
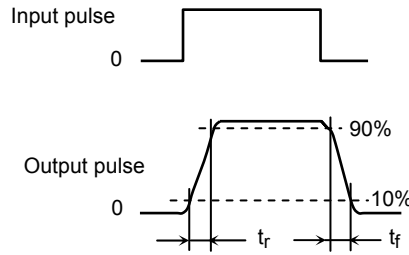
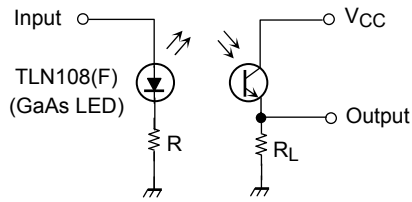
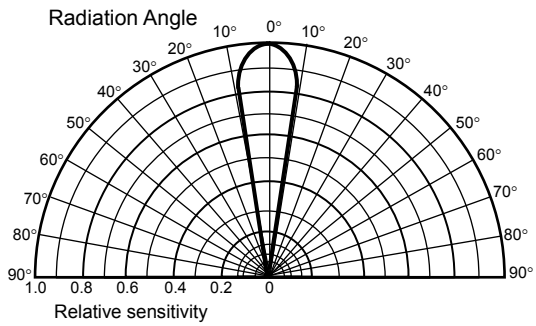


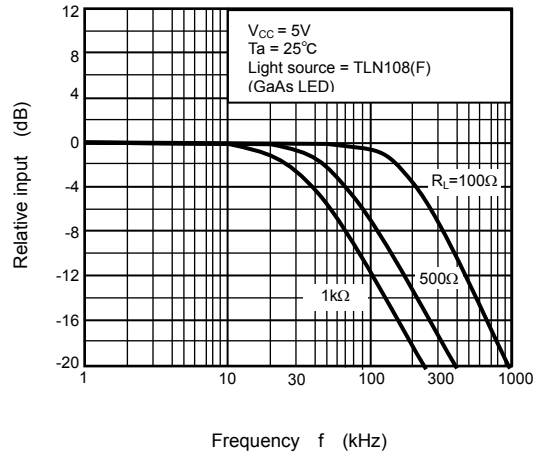
Fig.1 Switching time test circuit



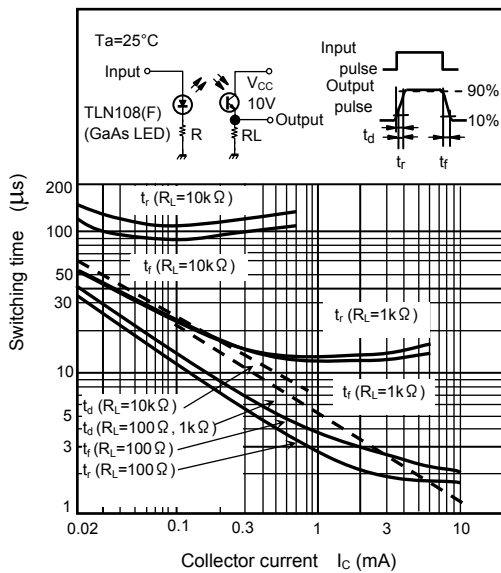
Directional Sensitivity Characteristic (typ.)
($T_a = 25^\circ\text{C}$)

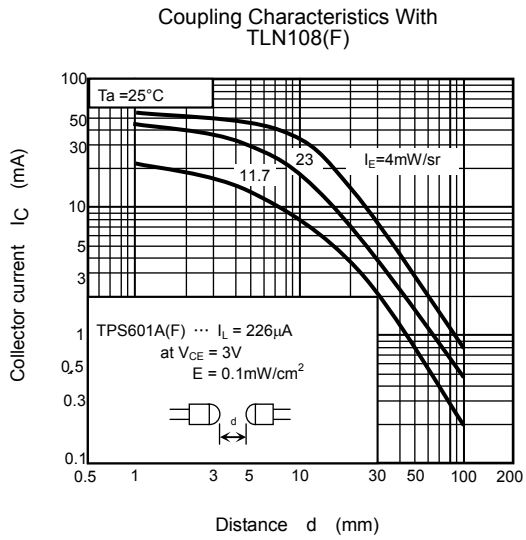
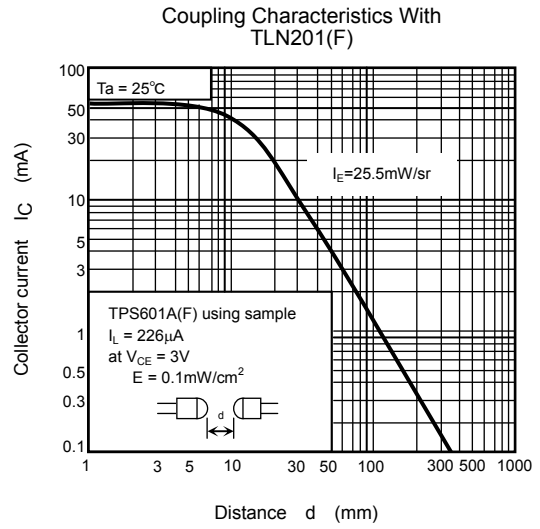
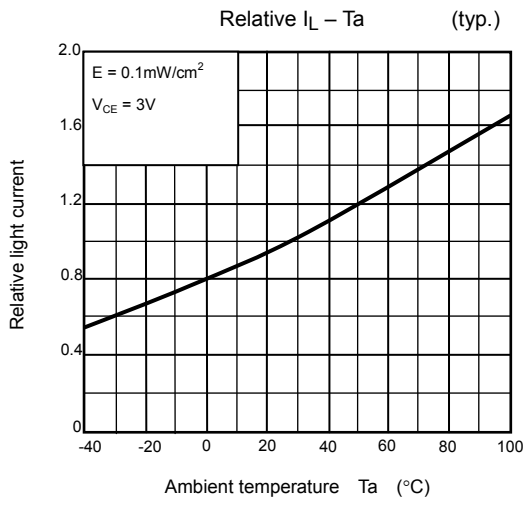


Frequency Characteristics (typ.)



Switching Characteristics (typ.)





RESTRICTIONS ON PRODUCT USE

20070701-EN

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