TOSHIBA Photodiode Silicon Pin

TPS703(F), TPS704(F)

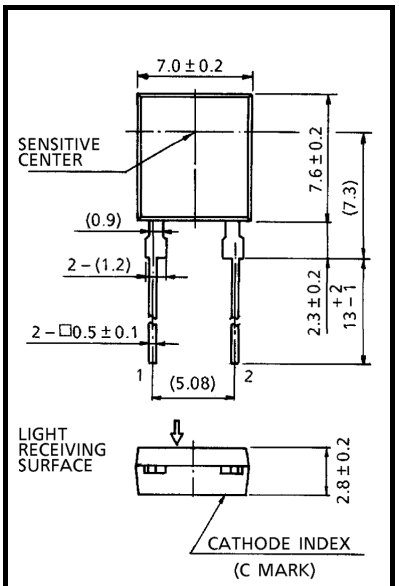
Lead(Pb)-Free

Various Kinds Of Remote Control Systems

Optical Communication

- Detector for visible, fluorescent, and other disturbance light.
  TPS703(F): $\lambda > 700$nm
  TPS704(F): $\lambda > 800$nm
- High sensitivity TPS703(F): I_{SC} = 1.5μA (typ.)
  TPS704(F): I_{SC} = 0.9μA (typ.)
- High speed response: t_r, t_f = 100ns (typ.)
- Wide half value angle: θ1/2 = ±65° (typ.)
- TLN115A(F), etc. are available as high radiant power infrared LEDs.

Unit in mm

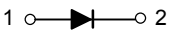


Weight: 0.31 g (typ.)

Absolute Maximum Ratings (Ta = 25°C)

Characteristic		Symbol	Rating	Unit
Reverse voltage		V_R	20	V
Power dissipation		P_D	150	mW
Power dissipation derating (Ta > 25°C)	TPS703(F)	ΔP_D / °C	−2.31	mW / °C
	TPS704(F)		−4.3	
Operating temperature range	TPS703(F)	T_{opr}	−30~80	°C
	TPS704(F)		−30~60	
Storage temperature range	TPS703(F)	T_{stg}	−40~90	°C
	TPS704(F)		−40~60	
Soldering temperature·time		T_{sol}	260°C·3s	—

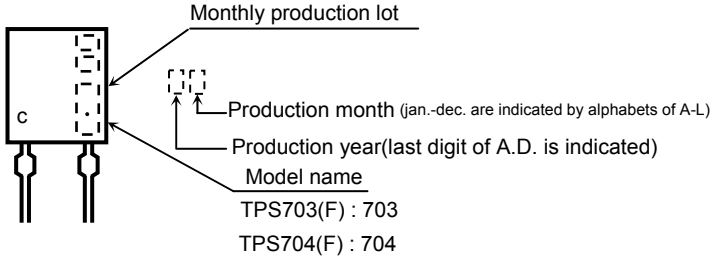
Pin Connection



1. Anode
2. Cathode

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).

Product Indication



Opto–electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Condition		Min.	Typ.	Max.	Unit
Short circuit current		I_{SC}	E = 0.1mW / cm^2 (Note)	TPS703(F)	0.9	1.5	—	μA
				TPS704(F)	0.5	0.9	—	
Dark current		I_D	V_R = 10V, E = 0		—	1	30	nA
Open circuit voltage		V_{OP}	E = 0.1mW / cm^2 (Note)	TPS703(F)	150	250	—	mV
				TPS704(F)	90	150	—	
Capacitance		C_T	V_R = 3V, f = 1MHz		—	20	—	pF
Peak sensitivity wavelength		λ_P	—	TPS703(F)	—	960	—	nm
				TPS704(F)	—	1000	—	
Switching time	Rise time	t_r	V_R = 10V, R_L = 1kΩ		—	100	—	ns
	Fall time	t_f			—	100	—	
Half value angle		$\theta\frac{1}{2}$			—	±65	—	°

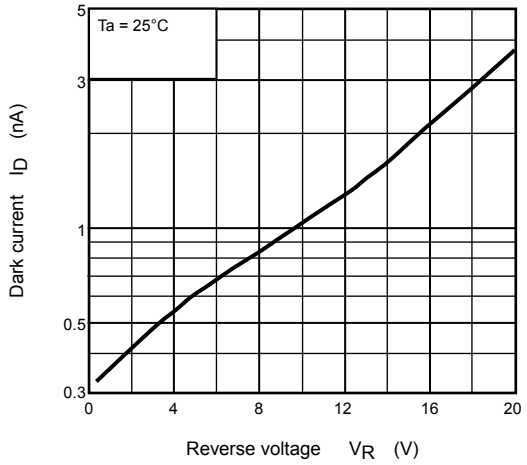
Note: Color temperature = 2870K , standard tungsten lamp.

Precaution

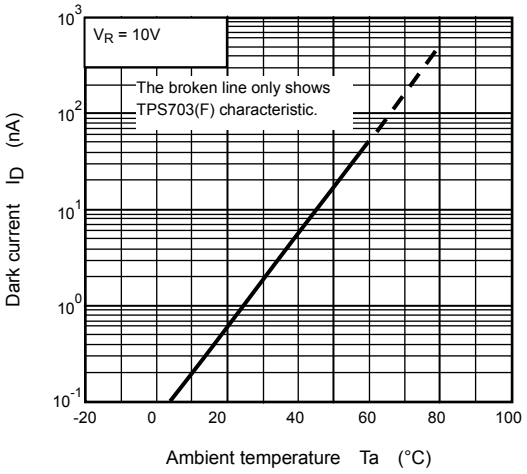
Please be careful of the followings.

1. Soldering shall be performed at a portion of lead above 2.3mm from the body of the device.
2. If the lead is formed, the lead should be formed at a distance of 2.3mm from the body of the device. Soldering shall be performed after lead forming.

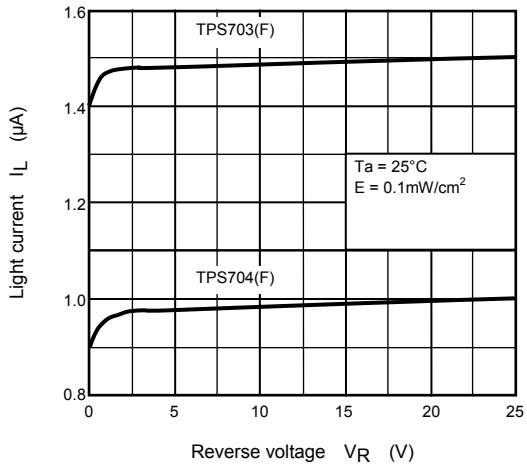
$I_D - V_R$ (typ.)



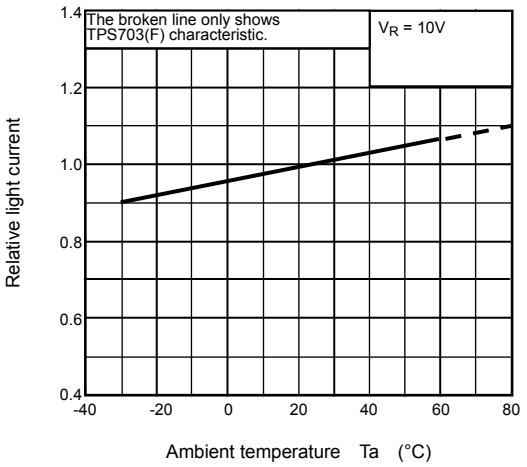
$I_D - Ta$ (typ.)



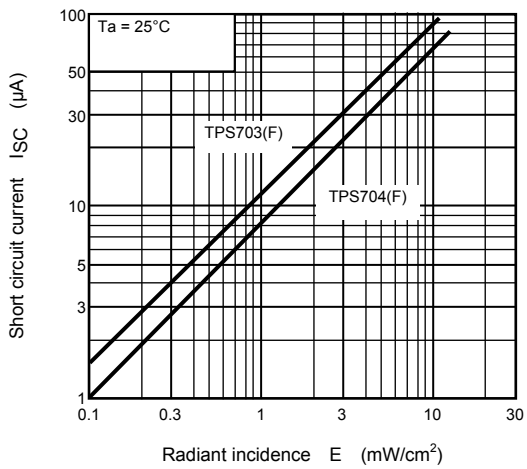
$I_L - V_R$ (typ.)



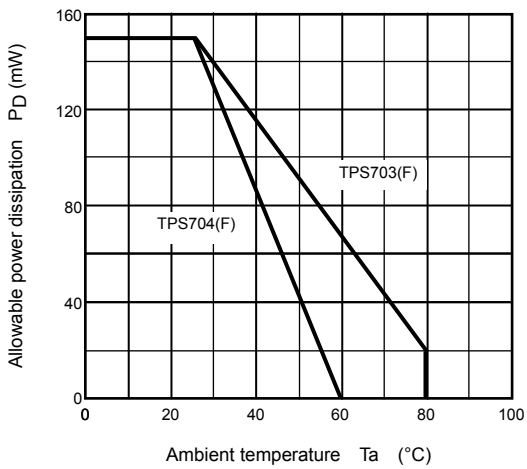
Relative I_L – Ta (typ.)



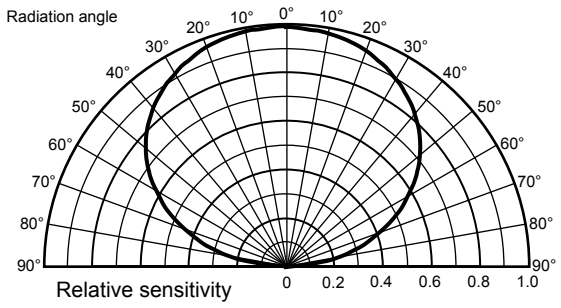
$I_{SC} - E$ (typ.)



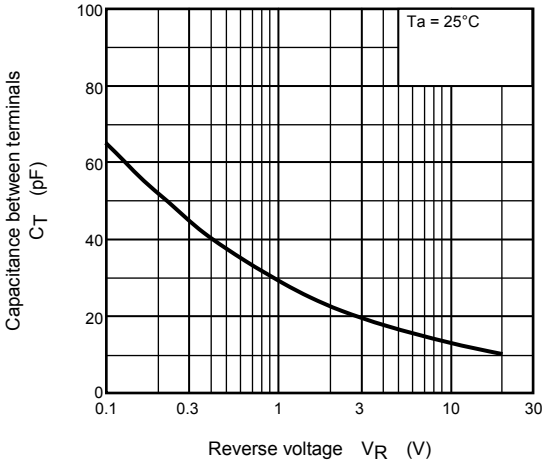
$P_D - Ta$



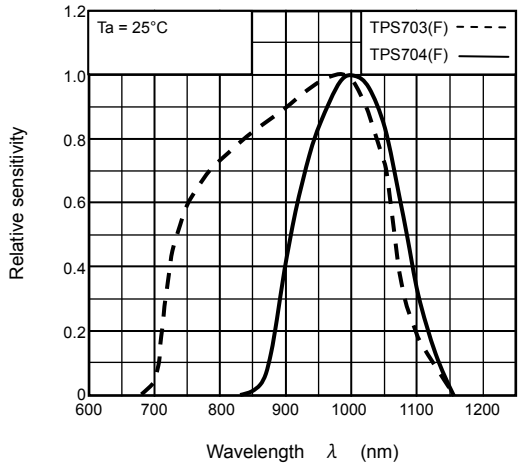
Directional Sensitivity Characteristic
(typ.) (Ta = 25°C)



$C_T - V_R$ (typ.)



Spectral Response (typ.)



RESTRICTIONS ON PRODUCT USE

20070701-EN GENERAL

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- TOSHIBA is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products could cause loss of human life, bodily injury or damage to property.
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