

**Preliminary**

TOSHIBA Photo IC Silicon Epitaxial Planar

# TPS820

Photo-Electric Switches

Copiers, Printers, and Facsimiles

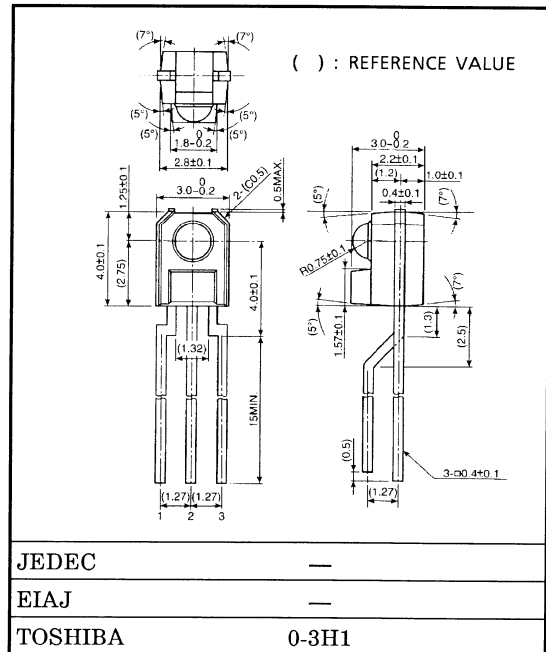
Luminosity Adjustment for Various Types of Equipment

The TPS820 is a linear output photo-IC (current output type) which incorporates a photodiode and a current amp circuit in a single chip.

The sensitivity is superior to that of a phototransistor and its illuminance output linearity is excellent.

- High sensitivity:  $I_L = 2.5 \text{ mA (typ.) @ } E = 0.1 \text{ mW/cm}^2$
- Little fluctuation in light current
- Output linearity of illuminance is excellent.
- Low current consumption:  $I_{CC} = 1 \mu\text{A (max) at } V_{CC} = 5 \text{ V}$
- Housed in compact side-view epoxy resin package
- Black package impermeable to visible light
- The TPS820 is suitable for use in combination with the TLN117 infrared LED lamp whose package size is the same.

Unit in mm



Weight : 0.12g (TYP.)

## Maximum Ratings (Ta = 25°C)

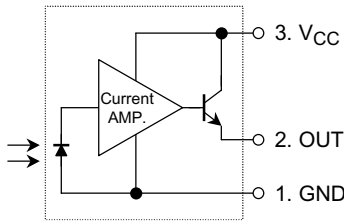
Characteristics	Symbol	Rating	Unit
Supply voltage	$V_{CC}$	-0.5~7	V
Output voltage	$V_O$	$\leq V_{CC}$	V
Light current	$I_L$	10	mA
Power dissipation	P	250	mW
Power dissipation derating	$\Delta P/^\circ\text{C}$	-3.33	mW/°C
Operating temperature range	$T_{opr}$	-25~85	°C
Storage temperature range	$T_{stg}$	-40~100	°C
Soldering temperature (5 s) (Note1)	$T_{sol}$	260	°C

Note1: At the location of 1.3 mm from the resin package bottom

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Pin Configuration

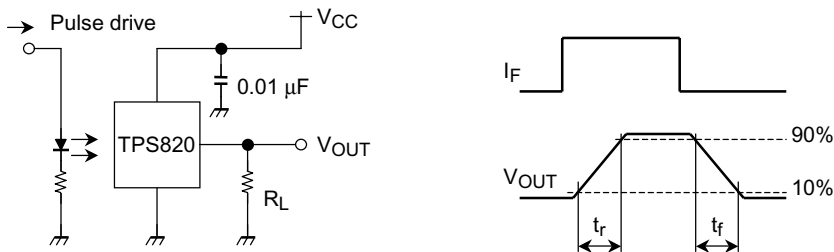


Optical and Electrical Characteristics (Ta = 25°C, VCC = 5 V)

Characteristics	Symbol	Test Condition	Min	Typ.	Max	Unit
Current consumption	$I_{CC}$	$E = 0$ , $I_L$ must be open between pins	—	0.017	1	$\mu A$
Light current (1)	$I_L(1)$	$E = 0.01 \text{ mW/cm}^2$ (Note2)	100	250	400	$\mu A$
Light current (2)	$I_L(2)$	$E = 0.1 \text{ mW/cm}^2$ (Note2)	1	2.5	4	mA
Output linearity	$I_L(2)/I_L(1)$	—	8	10	12	—
Saturation output voltage	$V_{OUT(sat)}$	$E = 0.1 \text{ mW/cm}^2$ (Note2) $R_L = 10 \text{ k}\Omega$	4.1	4.2	—	V
Dark current	$I_D$	$E = 0$	—	—	0.5	$\mu A$
Peak sensitivity wavelength	$\lambda_p$	—	—	870	—	nm
Rise time	$t_r$	$V_{OUT} = 2.5 \text{ V}$ $R_L = 10 \text{ k}\Omega$ (Note3)	—	250	—	$\mu s$
Fall time	$t_f$		—	700	—	$\mu s$

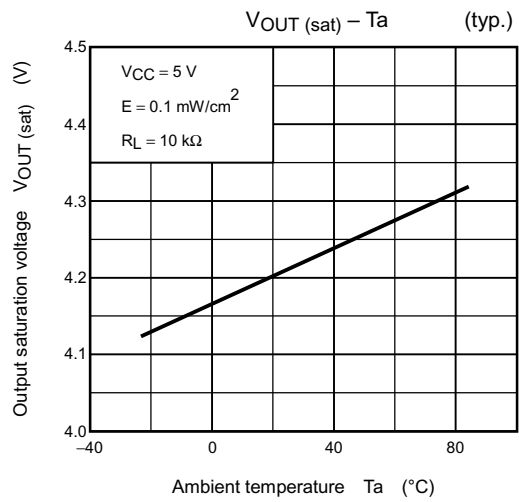
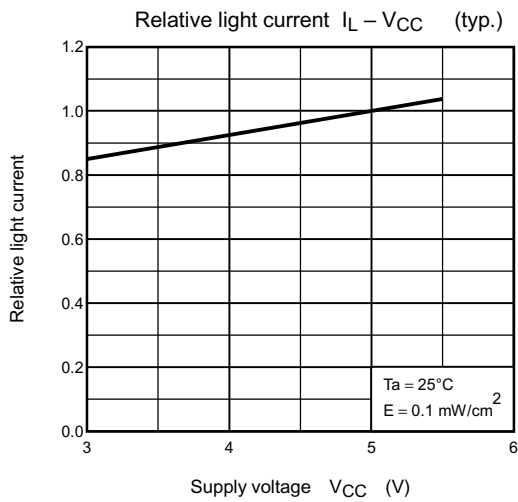
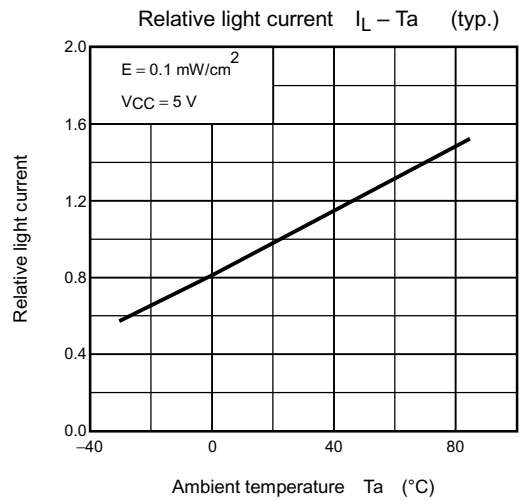
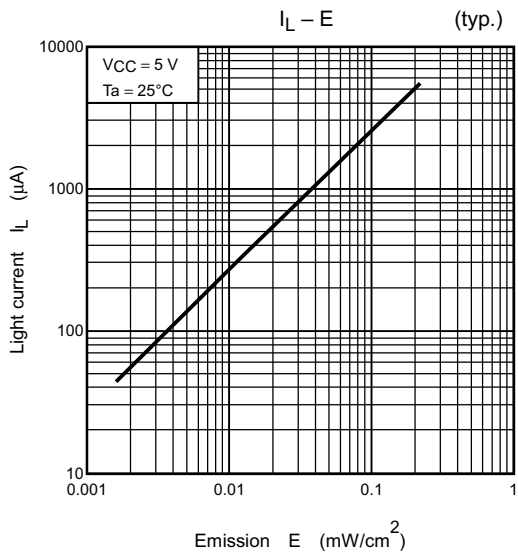
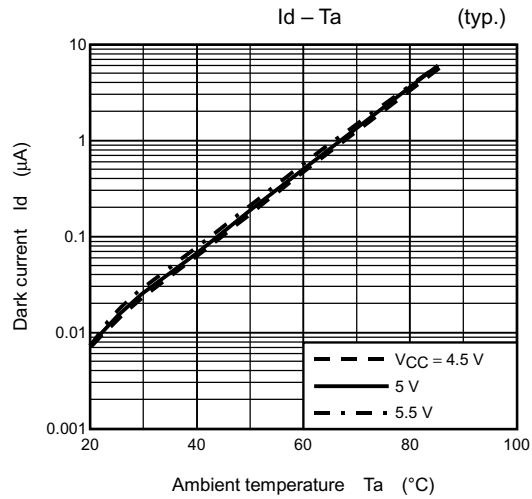
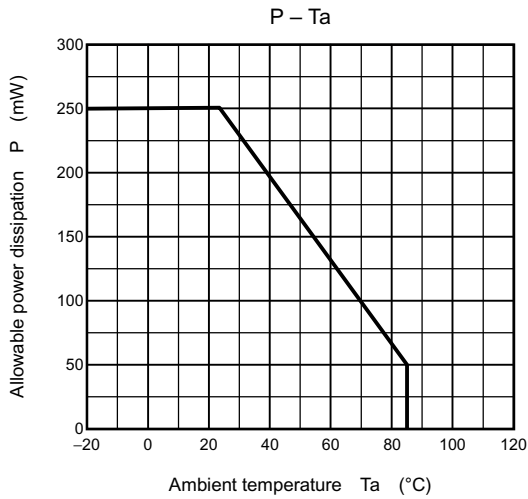
Note2: The light used is a CIE standard A light source (a standard tungsten bulb with a color temperature of 2856K)

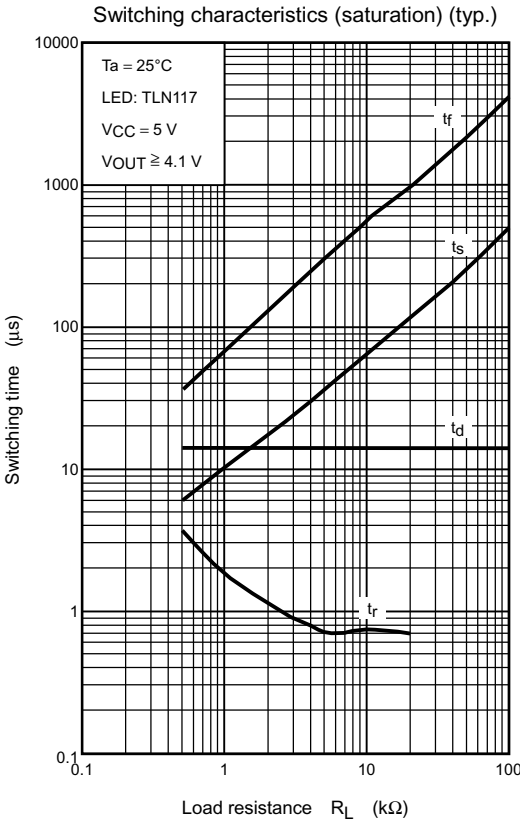
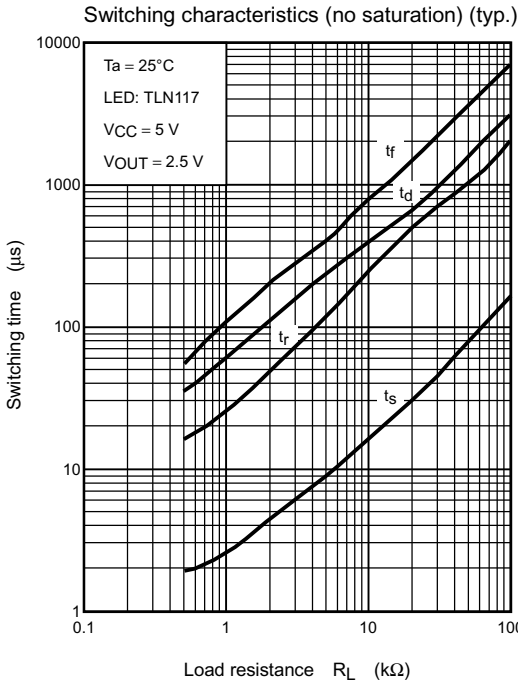
Note3: Switching time measurement circuit and waveform



Precautions

- When this device is used in combination with an LED lamp, the lamp must be an infrared LED lamp.
- To stabilize the power line, insert a bypass capacitor of up to 0.01  $\mu F$  between VCC and GND, close to the device.
- When the power is turned on, the output value will fluctuate for 1 ms as the internal circuit stabilizes.





Switching time measurement circuit and waveform

