

# Low Power Consumption Photo-IC

TPS842

## Outline

The TPS842 is a digital-output Si photo-IC which incorporates a photodiode, an amplifier circuit and a schmitt trigger circuit in a single chip. The TPS842 is a low-voltage drive device which has been designed for 3.3-V systems. The device allows construction of low-voltage systems which thus consume less power. In addition, the sensitivity of the device is superior to that of a phototransistor.

## Features

- Compact side-view epoxy resin package (black package impermeable to visible light)
  - Digital-output Si photo-IC which incorporates a photodiode, amplifier circuit and schmitt trigger circuit in a single chip
  - Low-voltage drive: operating power supply voltage:  $V_{CC} = 2.7\text{ V} \sim 7\text{ V}$ 
    - High-speed response:  $t_{pLH} = 15\text{ }\mu\text{s}$
  - Threshold radiant incidence:  $E_{HL} = 0.3\text{ mW/cm}^2$  (max) @  $T_a = 25^\circ\text{C}$
- Digital output: low-level output when optical input signal is received (open-collector)
  - Direct connection to TTL and CMOS devices possible



## Maximum Rating (Ta = 25°C)

Characteristic	Symbol	Rating	Unit
Supply Voltage	V <sub>CC</sub>	7	V
Output Voltage	V <sub>O</sub>	15	V
Low-Level Output Current(Ta=Topr)	I <sub>OL</sub>	8	mA
Operating Temperature	T <sub>opr</sub>	-25 ~ 85	°C
Storage Temperature	T <sub>stg</sub>	-40 ~ 100	°C
Soldering Temperature(5s) (Note1)	T <sub>sol</sub>	260	°C

Note 1: Soldering is carried out 1.3 mm from the resin which comprises the underside of the package.

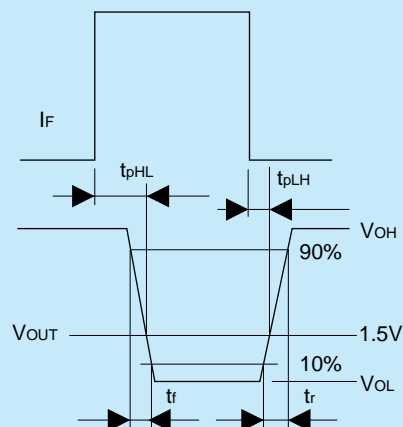
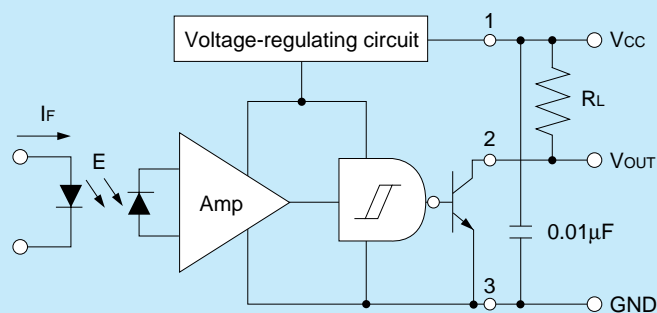
## Optical and Electrical Characteristics

(unless otherwise specified: Ta = 25° ~ 85°C and V<sub>CC</sub> = 2.7 V ~ 7 V)

Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Supply Voltage	V <sub>CC</sub>	—	2.7	—	7	V
High-Level Supply Ccurrent	I <sub>CCH</sub>	E=0	—	0.01	1.2	mA
Low-Level Supply Current	I <sub>CCL</sub>	E=2mW/cm <sup>2</sup> (Note2)	—	—	2.0	mA
High-Level Output Current	I <sub>OH</sub>	E=0, V <sub>O</sub> =15V	—	—	6.3	μA
Low-Level Output Voltage	V <sub>OL</sub>	E=2mW/cm <sup>2</sup> (Note2) I <sub>OH</sub> =8mA	—	—	0.4	V
Threshold Radiant Incident(H→L)	E <sub>HL</sub>	Ta=25°C	—	0.1	0.3	mW/cm <sup>2</sup>
		—	—	—	0.6	
Hysteresis	E <sub>HL</sub> /E <sub>LH</sub>	Ta=25°C	1.1	1.5	2	—
Peak Wavelength	λ <sub>p</sub>	—	—	900	—	nm
Switching Time	Propagation delay time(L→H)	Ta=25°C V <sub>CC</sub> =3.3V E=2mW/cm <sup>2</sup> (Note2) R <sub>L</sub> =10kΩ(Note3)	—	—	15	μs
	Propagation delay time(H→L)		—	—	9	
	Rise time		—	0.8	—	
	Fall time		—	0.05	—	

Note2: The light used is a CIE standard A light source ( standard tungsten bulb and color temperature = 2870 °K )

Note3: Test conditions when measuring rise and fall time



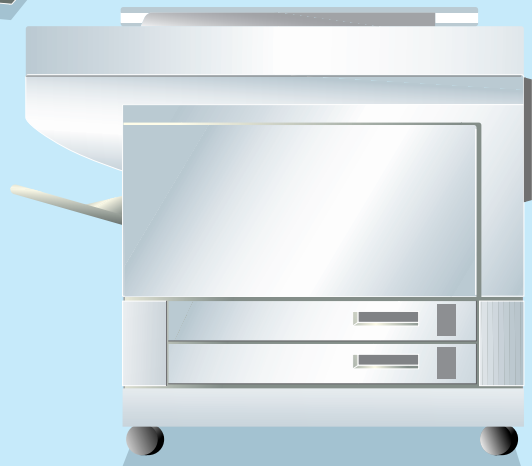


## Applications

- Photo-electric switches
- Office equipment: (copying machines, printers and fax machines)
  - Drum rotation detection, paper detection and paper feed detection
- Vending machines, ticket machines and ATMs
- Handheld terminals



Copying machines



Printers



Fax machines

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