

Low-Power Photo-IC TPS840 Series

Outline

The devices which comprise the TPS840 Series are digital output photo-ICs which incorporate a photodiode, an amplifier and a Schmitt trigger circuit in a single chip. In addition to the conventional 5-V systems, the photo-ICs are low-voltage drive devices which have been designed for 3.3-V systems. The photo-ICs allow construction of low-voltage systems which thus consume less power.

Since the TPS840 Series devices can be used in the 5-V systems, it is possible to replace the TPS811/812/813/814 with these devices.

Moreover, the sensitivity of the devices are superior to that of a phototransistor.



Features

- ▶ Compact side-view resin package (black package impermeable to visible light)
- ▶ Digital-output photo-IC which incorporates a photodiode, an amplifier circuit and a Schmitt trigger circuit in a single chip
- ▶ Low voltage and low power consumption
 - Designed for 3.3-V/5-V/12-V system: $V_{CC} = 2.7$ to 15 V
 - Low consumption current: $I_{CC} \leq 1.7$ mA
- ▶ High sensitivity:
 - TPS841/843 $E_{LH} \leq 0.3$ mW/cm²
 - TPS842A/844 $E_{HL} \leq 0.3$ mW/cm²
- ▶ High-speed response: $t_{pLH} \leq 15\mu\text{s}$, $t_{pHL} \leq 9\mu\text{s}$

Lineup

- ① TPS841 ···· Open-collector (normally open)
- ② TPS842A ··· Open-collector (normally closed)
- ③ TPS843 ···· With pull-up resistor (normally open)
- ④ TPS844 ···· With pull-up resistor (normally closed)

Maximum Rating (Ta = 25°C)

Characteristic	Symbol	Rating	Unit
Supply voltage	V_{CC}	15	V
Output voltage	TPS841/TPS842A	15	V
	TPS843/TPS844	$\leq V_{CC}$	
Low-level output current (Ta = Topr)	I_O	16	mA
Power dissipation	P_D	150	mW
Operating temperature	Topr	-30 to 95	°C
Storage temperature	Tstg	-40 to 100	°C
Soldering temperature (5 s) (Note 1)	Tsol	260	°C

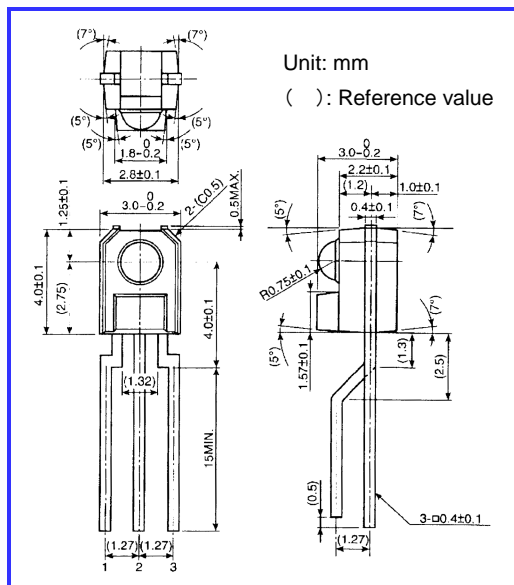
Note 1: Soldering is performed 1.3 mm from the bottom of the resin package.

Optical and Electrical Characteristics (Ta = 25°C)

Product No.	Package Type	Output configuration		Threshold Radiant Incidence (mW/cm ²)			Peak Sensitivity Wavelength (nm)	Half-angle value (°)
		With Resistor	Open-Collector	L→H (max)	H→L (max)	V_{CC}		
TPS841	Compact side-view	—	○	0.3	—	2.7 to 15	900	±15
TPS842A		—	○	—	0.3			
TPS843		○	—	0.3	—			
TPS844		○	—	—	0.3			

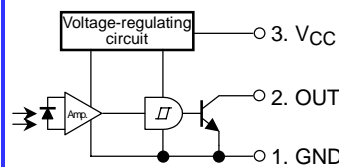
Note 2: For details, please refer to each technical datasheet.

Package Dimensions

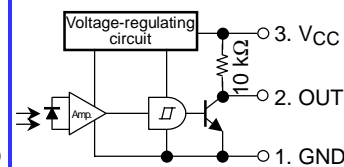


Pin Connection

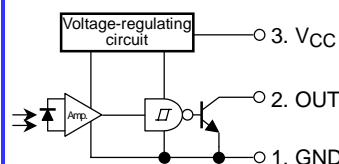
TPS841



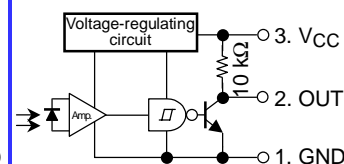
TPS843



TPS842A



TPS844

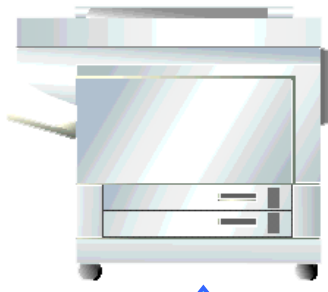


Applications

Coping machines

Laser beam printers

Fax machines



- Paper location detection
- Toner density detection
- Photo-electric switches/luminosity adjustment

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