

TOSHIBA PHOTO IC SILICON EPITAXIAL PLANAR

# TPS806

PHOTO IC FOR PHOTO INTERRUPTER

PHOTOELECTRIC COUNTER

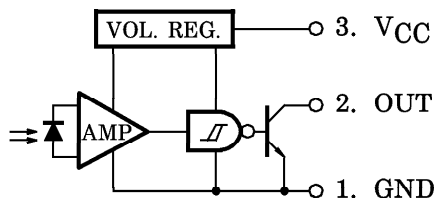
POSITION AND ROTATIONAL SPEED SENSOR

- TPS806 is a photo IC integrating photo diode, amplifier circuit and waveform shaping circuit in 1 chip.
- Visible light cut resin is used. :  $\lambda_p=900\text{nm}$  (TYP.)
- The same external shape as the infrared LED TLN107A, and is best suited for combination with TLN107A as a photo interrupter.
- High speed response :  $t_{pLH}=6\mu\text{s}$ ,  $t_{pHL}=2\mu\text{s}$  (TYP.)
- When light is received, output becomes low level.

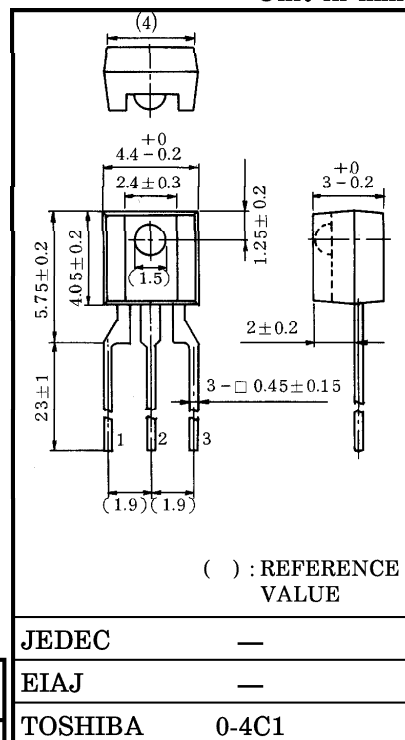
MAXIMUM RATINGS ( $T_a = 25^\circ\text{C}$ )

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	$V_{CC}$	17	V
High Level Output Voltage	$V_{OH}$	30	V
Low Level Output Voltage	$I_{OL}$	50	mA
Low Level Output Current Derating ( $T_a > 25^\circ\text{C}$ )	$\Delta I_{OL} / ^\circ\text{C}$	-0.67	mA / $^\circ\text{C}$
Power Dissipation	$P_O$	250	mW
Power Dissipation Derating ( $T_a > 25^\circ\text{C}$ )	$\Delta P_O / ^\circ\text{C}$	-3.33	mW / $^\circ\text{C}$
Operating Temperature Range	$T_{opr}$	-25~85	$^\circ\text{C}$
Storage Temperature Range	$T_{stg}$	-40~100	$^\circ\text{C}$
Soldering Temperature (5s)	$T_{sol}$	260	$^\circ\text{C}$

PIN CONNECTION



Unit in mm



JEDEC	—
EIAJ	—
TOSHIBA	0-4C1

Weight : 0.19g (TYP.)

961001EAA2

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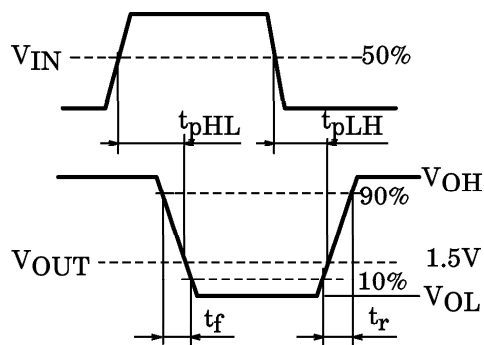
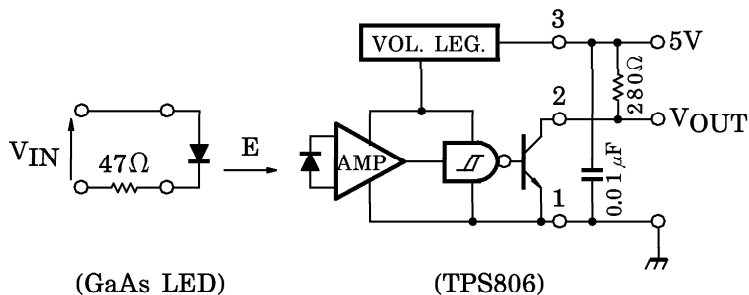
OPTO-ELECTRICAL CHARACTERISTICS (Ta = 25°C)

(Ta = 0~70°C, Characteristics with no entry of Ta = 25°C in the test conditions. Typical values are all at 25°C.)

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Supply Voltage		V <sub>CC</sub>		4.5	—	17	V	
Low Level Output Voltage		V <sub>OL</sub>	I <sub>OL</sub> = 16mA, V <sub>CC</sub> = 5V E = 2mW/cm <sup>2</sup>	—	0.07	0.4	V	
High Level Output Current		I <sub>OH</sub>	V <sub>CC</sub> = 5V, V <sub>OH</sub> = 30V, E = 0	—	—	100	μA	
Supply Current	Low Level	I <sub>CCL</sub>	V <sub>CC</sub> = 5V, E = 2mW/cm <sup>2</sup>	—	2.5	5	mA	
	High Level	I <sub>CCH</sub>	V <sub>CC</sub> = 5V, E = 0	—	1.2	3		
“H”→“L” Threshold Radiant Incidence (Note 1)		E <sub>HHL</sub>	V <sub>CC</sub> = 5V, Ta = 25°C	—	0.1	0.3	mW/cm <sup>2</sup>	
			V <sub>CC</sub> = 5V	—	—	0.6		
Histerisis Ratio		E <sub>LH</sub> / E <sub>HHL</sub>	Ta = 25°C, V <sub>CC</sub> = 5V	—	0.65	—	—	
Peak Sensitivity Wavelength		λ <sub>P</sub>		—	900	—	nm	
Switching Time	Propagation Delay Time	“L”→“H”	t <sub>pLH</sub>	Ta = 25°C, V <sub>CC</sub> = 5V E = 2mW/cm <sup>2</sup> R <sub>L</sub> = 280Ω (Note 2)	—	6	—	μs
		“H”→“L”	t <sub>pHL</sub>		—	2	—	
	Rise Time		t <sub>r</sub>		—	0.1	—	
	Fall Time		t <sub>f</sub>		—	0.03	—	

Note 1 : Color temperature = 2870°K, Standard Tungsten Lamp.

Note 2 : Switching time test circuit.



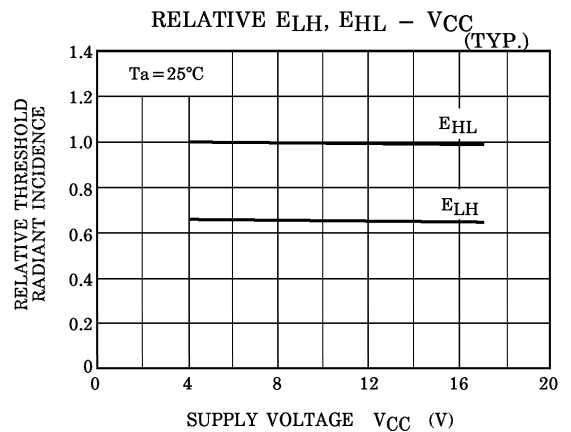
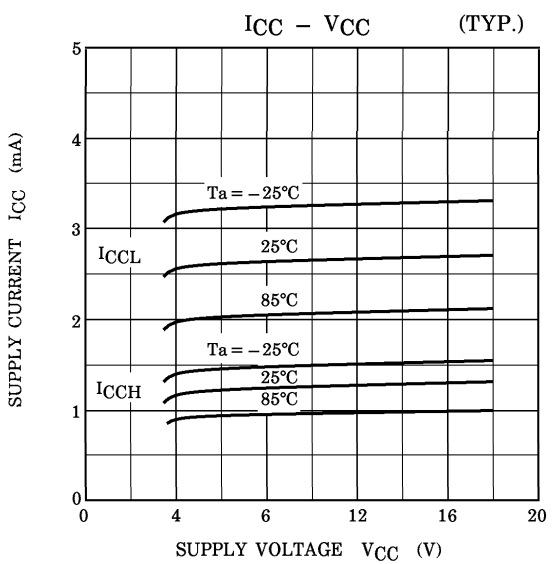
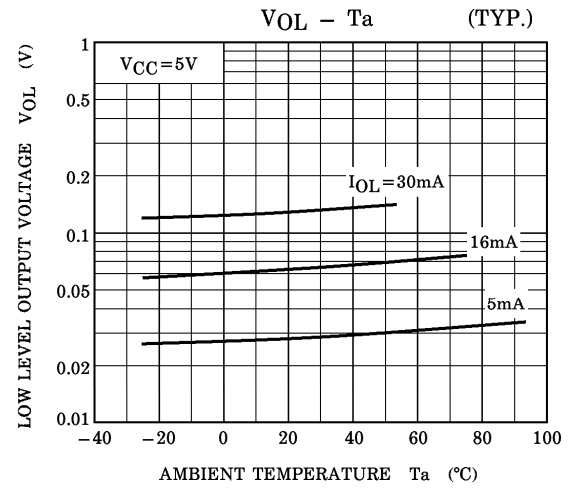
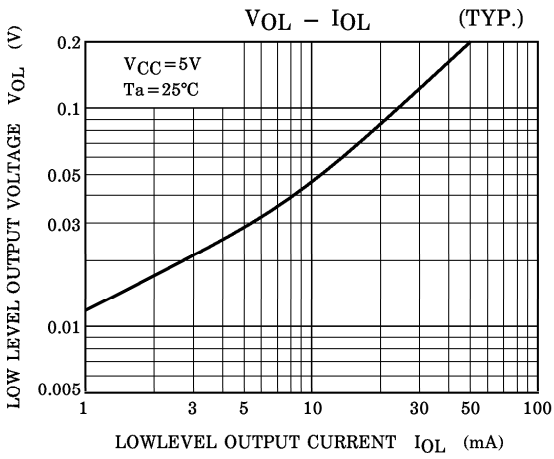
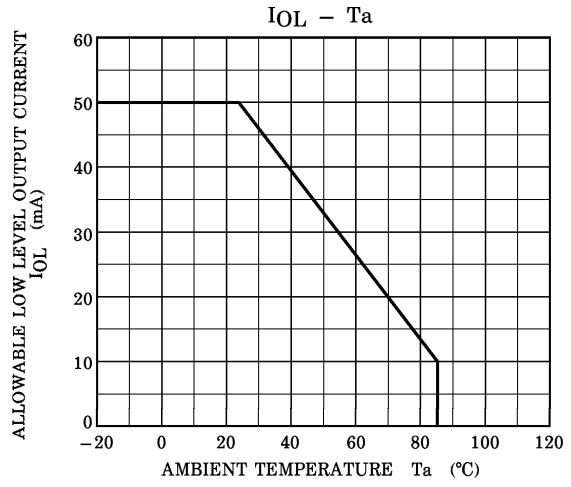
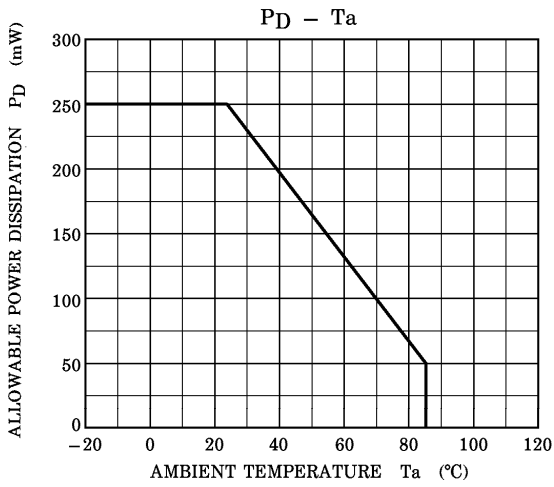
## RECOMMENDED OPERATING CONDITIONS

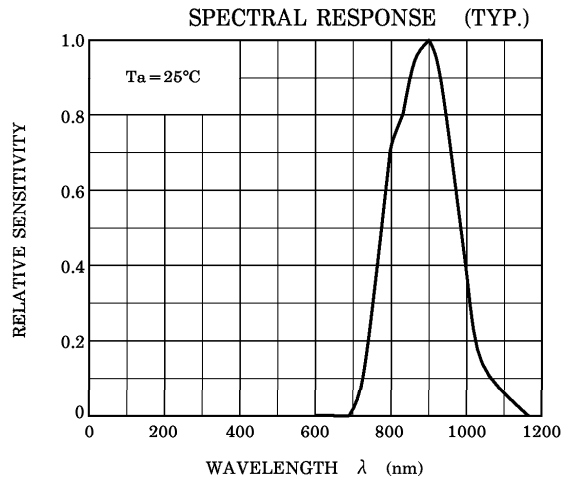
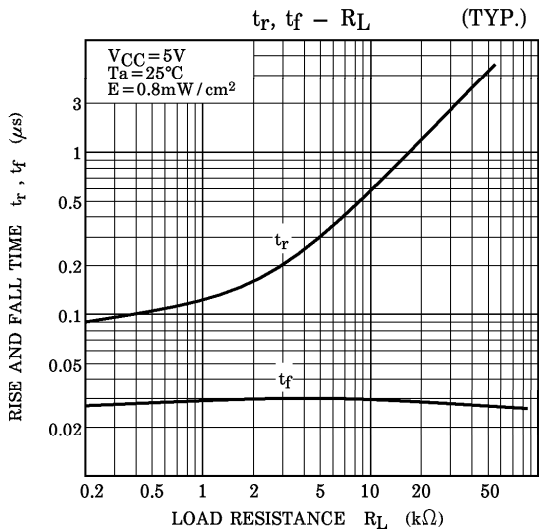
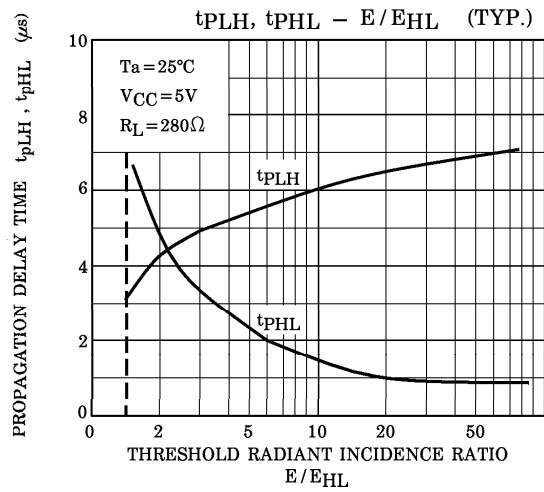
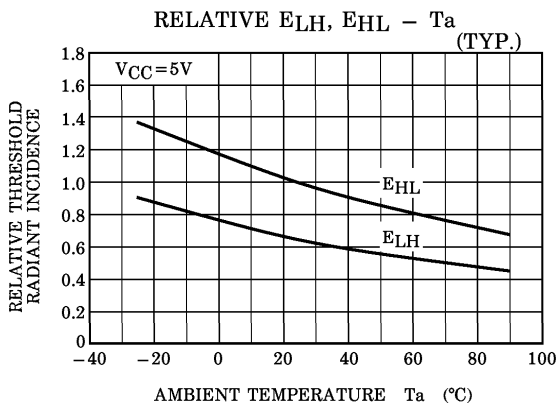
CHARACTERISTIC	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V <sub>CC</sub>	4.5	5	16	V
High Level Output Voltage	V <sub>OH</sub>	4.5	—	27	V
Radiant Incidence	E	0.8	—	—	mW/cm <sup>2</sup>
Operating Temperature	T <sub>opr</sub>	0	—	70	°C

## PRECAUTION

Please be careful of the followings.

1. 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.  
(Soldering portion of lead : above 2mm from the body of the device).
2. Supply the by-pass condenser up to 0.01 $\mu$ F between V<sub>CC</sub> and GND near device to stabilize the power supply line.
3. During 100 $\mu$ s after turning on V<sub>CC</sub>, output voltage changes for stabilizing the inner circuit.





DIRECTIONAL SENSITIVITY CHARACTERISTIC (TYP.)  
( $T_a = 25^{\circ}C$ )

