

TOSHIBA PHOTO IC SILICON EPITAXIAL PLANAR

TPS812, TPS814

PHOTOELECTRIC SWITCHES

COPIERS, PRINTERS, AND FACSIMILES

COMMODITY AND TICKET VENDING MACHINES AND TERMINAL EQUIPMENT IN FINANCIAL COMPUTER SYSTEMS

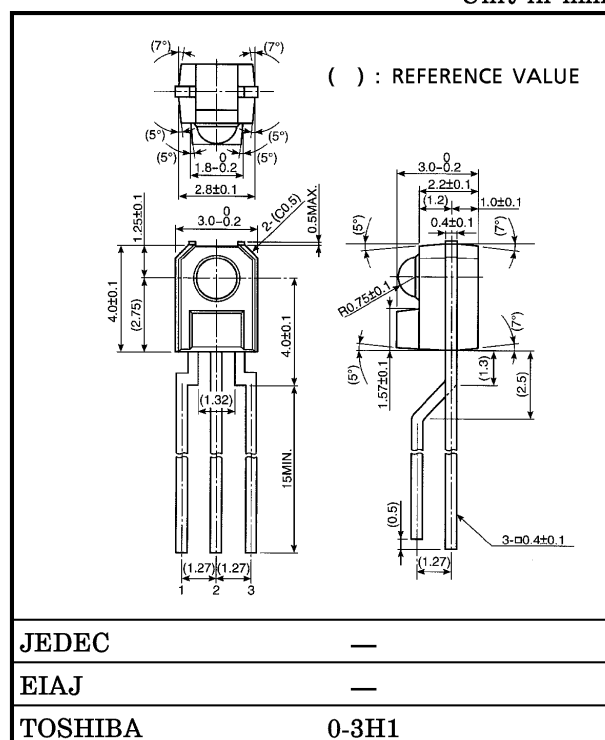
HANDY TERMINALS

The TPS812 and TPS814 represent a Si photo IC of digital output type that integrates a photodiode, amplifier circuit, and Schmitt trigger circuit into a single chip.

These devices respond faster than the phototransistor type. They output a low when light is input.

- Compact side-view epoxy resin package.
- High speed response
 : $t_{pLH}=5.5\mu s$, $t_{pHL}=2.5\mu s$ (TYP.)
- High sensitivity : $0.3mW/cm^2$ (MAX.)
- Can be directly connected to TTL and CMOS.
- Operates over a wide supply voltage range
 : $V_{CC}=4.5\sim 17V$
- Digital output
 TPS812 Open collector
 TPS814 With a pull-up resistor

Unit in mm



Weight : 0.12g (TYP.)

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Supply Voltage		V_{CC}	17	V
Output Voltage	TPS812	V_O	30	V
	TPS814		$\leq V_{CC}$	
Output Current		I_O	50	mA
Output Current Derating ($T_a > 25^{\circ}\text{C}$)		$\Delta I_O / ^{\circ}\text{C}$	-0.67	mA/ $^{\circ}\text{C}$
Power Dissipation		P_O	250	mW
Power Dissipation Derating		$\Delta P_O / ^{\circ}\text{C}$	-3.33	mW/ $^{\circ}\text{C}$
Operating Temperature Range		T_{opr}	-30~85	$^{\circ}\text{C}$
Storage Temperature Range		T_{stg}	-40~100	$^{\circ}\text{C}$
Soldering Temperature (5s) (Note 1)		T_{sol}	260	$^{\circ}\text{C}$

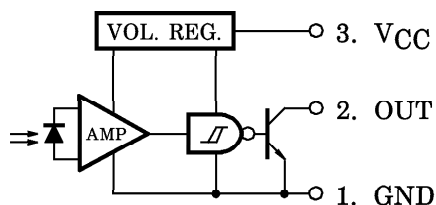
Note 1 : At the location of 1.5mm from the resin package bottom

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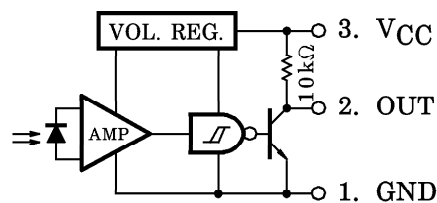
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PIN CONNECTION

TPS812



TPS814



OPTO-ELECTRICAL CHARACTERISTICS ($T_a = -30 \sim 85^\circ\text{C}$, $V_{CC} = 4.5 \sim 17\text{V}$, Typical values are all at 25°C .)

CHARACTERISTIC			SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Voltage			V _{CC}		4.5	—	17	V
High Level Supply Current			I _{CCH}	E = 0	—	1.2	3.2	mA
Low Level Supply Current	TPS812	I _{CCL}	E = 2mW / cm ² (Note 2)	—	2.5	5.2	mA	
	TPS814			—	4	7.5		
High Level Output Current		TPS812	I _{OH}	V _O = 30V, E = 0	—	—	15	μA
High Level Output Voltage		TPS814	V _{OH}	E = 0	0.9V _{CC}	—	—	V
Low Level Output Voltage			V _{OL}	E = 2mW / cm ² I _{OL} = 16mA (Note 2)	—	0.07	0.4	V
“H”→“L” Threshold Radiant Incidence			E _{HL}	Ta = 25°C	—	0.1	0.3	mW / cm ²
					—	—	0.6	
Histerisis Ratio			E _{HL} / E _{LH}	Ta = 25°C	1.1	1.5	2	—
Peak Sensitivity Wavelength			λ _P		—	900	—	nm
Switching Time	Propagation Delay Time	“L”→“H”	t _{pLH}	Ta = 25°C V _{CC} = 5V E = 2mW / cm ² R _L = 280Ω (Note 3)	—	5.5	15	μs
		“H”→“L”	t _{pHL}		—	2.5	9	
	Rise Time		t _r		—	0.02	0.5	
	Fall Time		t _f		—	0.08	0.5	

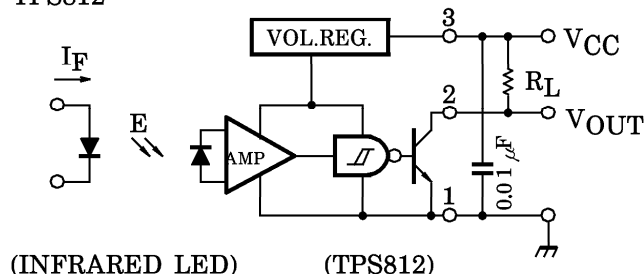
Note 2 : CIE standard light source A (standard tungsten bulb) with color temperature = 2856°K

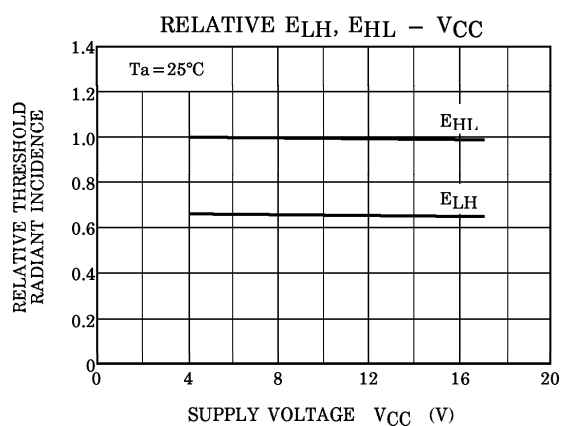
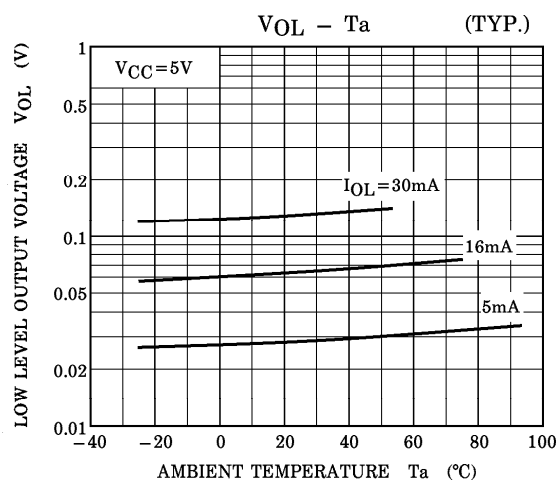
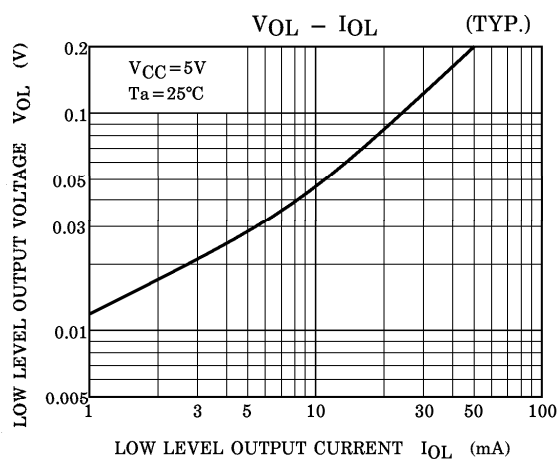
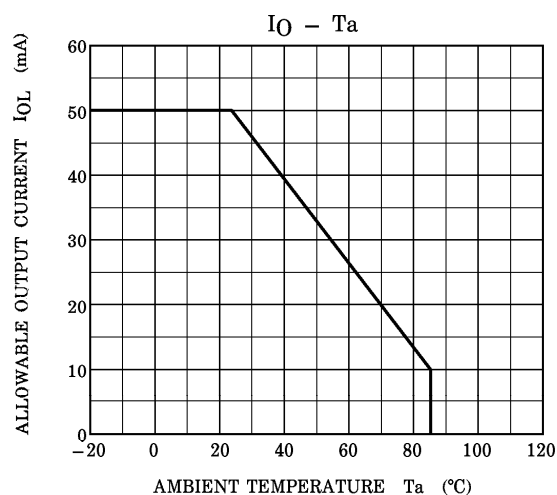
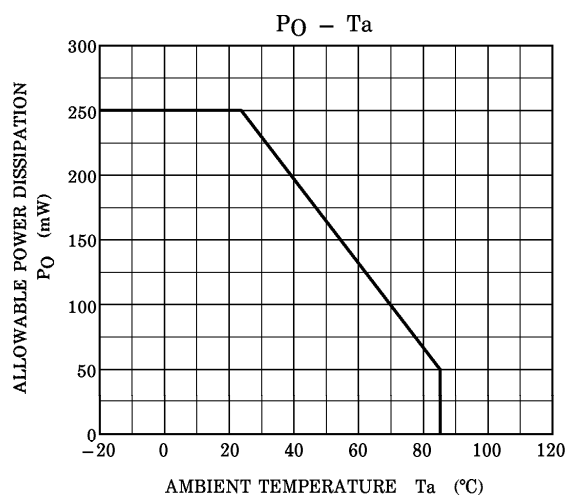
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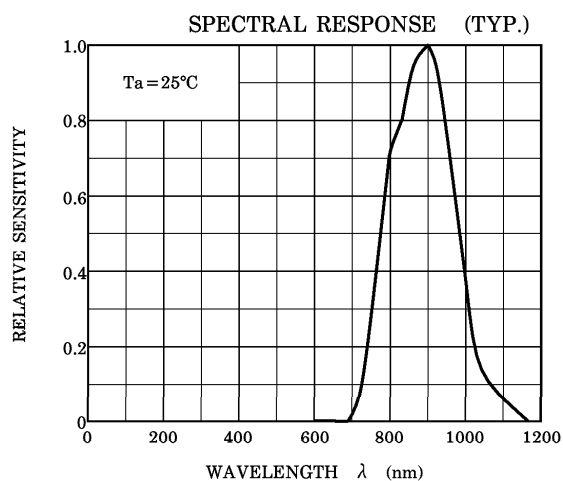
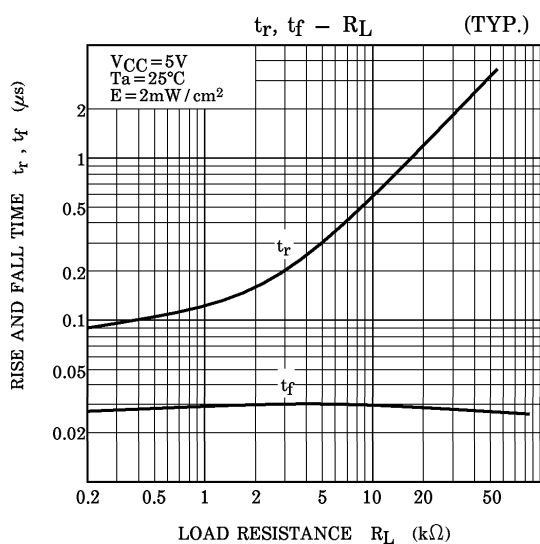
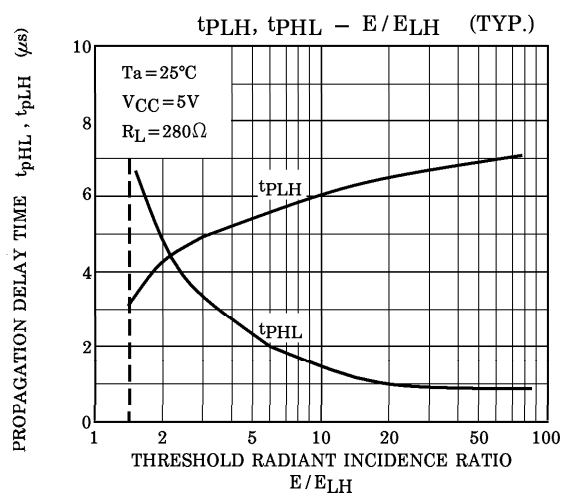
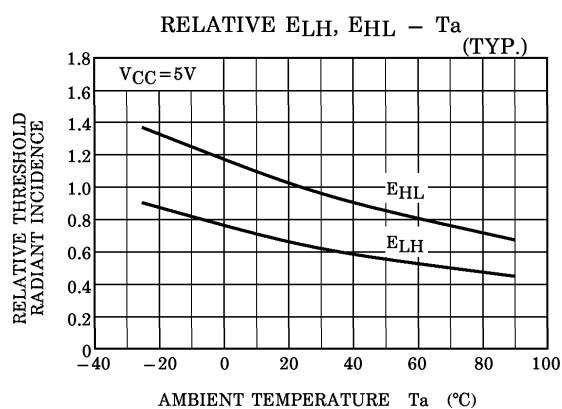
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Note 3 : Switching time measurement circuit and waveform

TPS812







DIRECTIONAL SENSITIVITY CHARACTERISTIC (TYP.)

($T_a=25^\circ C$)

