

OIP101

Open Collector Output Photodetector

GENERAL DESCRIPTION

The OIP101 is an open collector output photodetector that incorporates a photodiode, amplifier circuit, Schmitt-trigger circuit and a voltage regulator circuit on to a single chip.

FEATURES

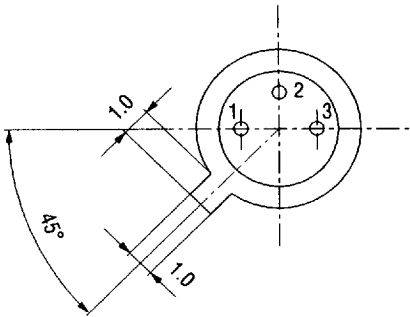
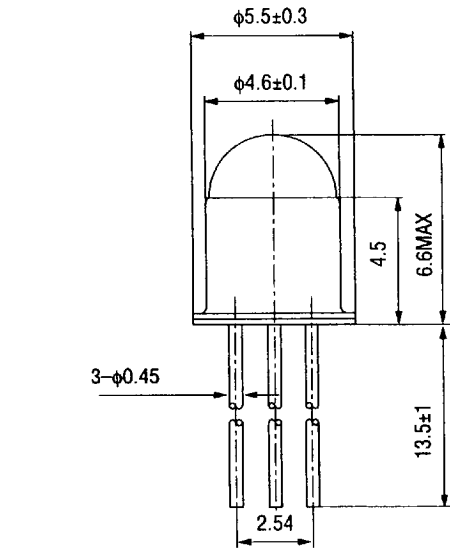
- Wide operating supply voltage range: $V_{CC}=3.4$ to 6.5
- Allows wave shaping output (on-chip Schmitt trigger circuit)
- High noise resistance (on-chip Schmitt trigger circuit)

APPLICATIONS

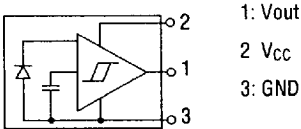
- FDD (Index hole detection for a floppy disk)
- FAX, printer, copying machine (Paper timing position detection)
- Encoder
- VTR, cassette deck (Tape and detection)
- Automatic vending machine
- Optoelectric switch

PIN CONFIGURATION

(Unit: mm)



• Pin Connection Diagram



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

Parameter	Symbol	Rating	Unit
Supply Voltage	V_{CC}	-0.3 to +7.0	V
Low Level Output Current	I_{OL}	10.0	mA
Output Terminal Applied Voltage	V_O	-0.3 to +10.0	V
Storage Temperature	T_{stg}	-40 to +135	$^{\circ}\text{C}$

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Rating	Unit
Operating Supply Voltage	V_{CC}	3.4 to 6.5	V
Operating Temperature	T_{opr}	-30 to +130	$^{\circ}\text{C}$

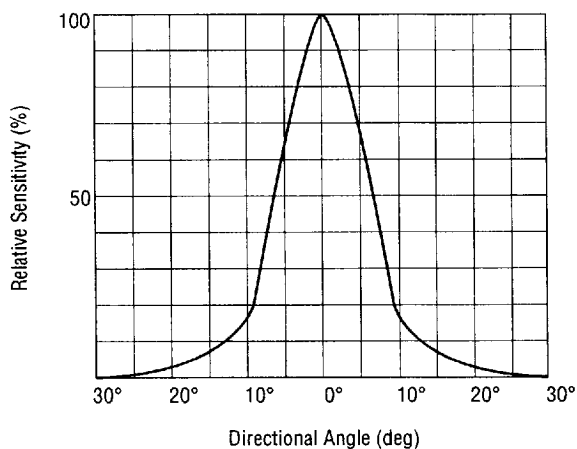
ELECTRICAL CHARACTERISTICS(Ambient Temperature $T_a=25^{\circ}\text{C}$, $V_{CC}=5\text{V}$)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Low Level Output Voltage	V_{OL}	$I_{OL}=6\text{ mA}$, $E=0\text{ L}_X$	—	80.0	350.0	mV
Output Leak Current	I_{LK}	$V_O=6.5\text{ V}$, $E=250\text{ L}_X$	—	—	10.0	μA
Low Level Supply Current	I_{CCL}	$E=0\text{ L}_X$	—	2.7	6.0	mA
High Level Supply Current	I_{CCH}	$E=250\text{ L}_X$	—	2.0	6.0	mA
L→H Threshold Illuminance *	E_{LH}	—	30	40	50	L_X
H→L Threshold Illuminance *	E_{HL}	—	—	28	—	L_X
Hysteresis	—	E_{HL}/E_{LH}	—	0.7	—	—
H→L Propagation Delay Time	t_{PLH}	$E=200\text{ L}_X$ $R_L=1\text{ k}\Omega$	—	3	9	μs
L→H Propagation Delay Time	t_{PHL}		—	2	10	μs
Rise Time	t_r		—	150	—	ns
Fall Time	t_f		—	50	—	ns
Peak Sensitivity Wavelength	λ_P	—	—	850	—	nm

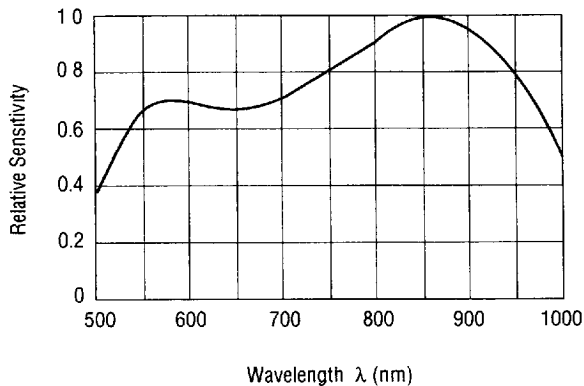
* Standard illuminants Type A

TYPICAL CHARACTERISTICS

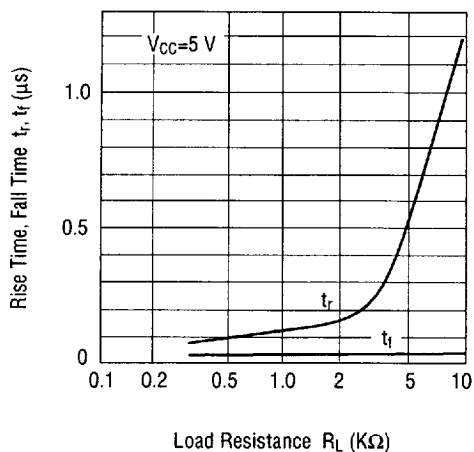
- Directional Characteristics**



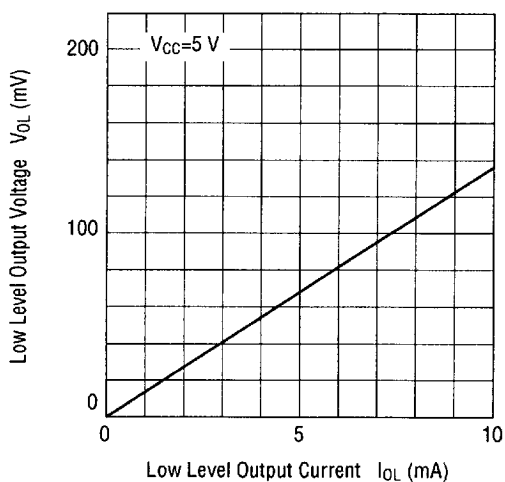
- Spectral Sensitivity ($T_a=25^{\circ}\text{C}$)**



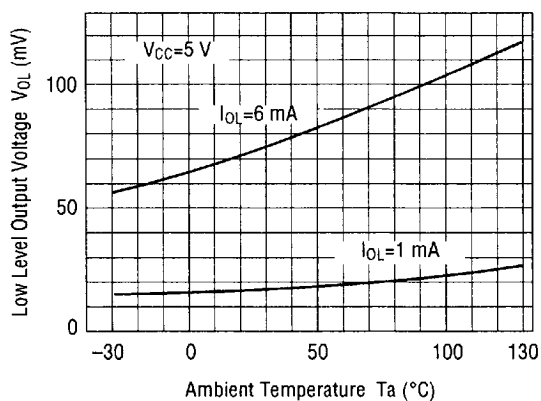
- Rise Time, Fall Time vs. Load Resistance ($T_a=25^\circ\text{C}$)



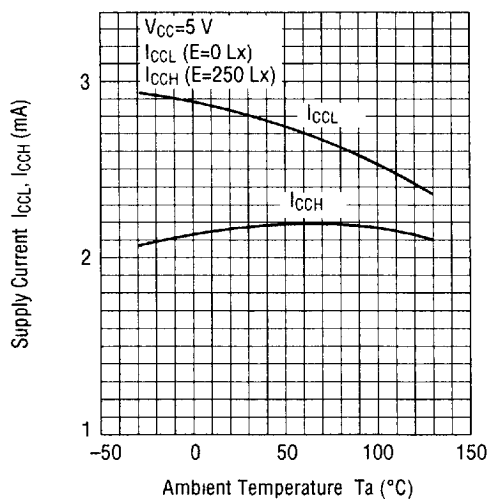
- Low Level Output Voltage vs. Low Level Output Current ($T_a=25^\circ\text{C}$)



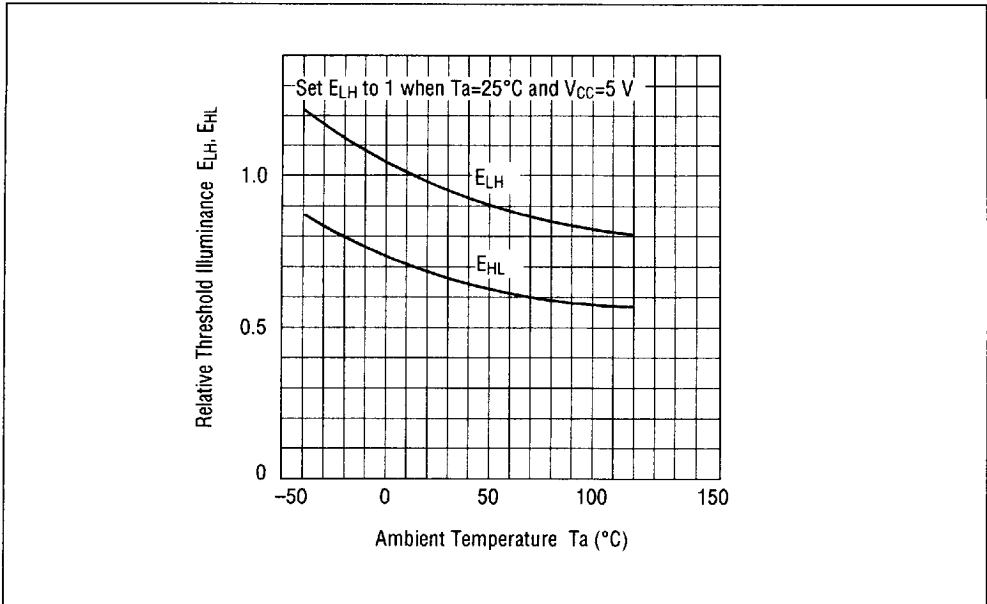
- Low Level Output vs. Ambient Temperature



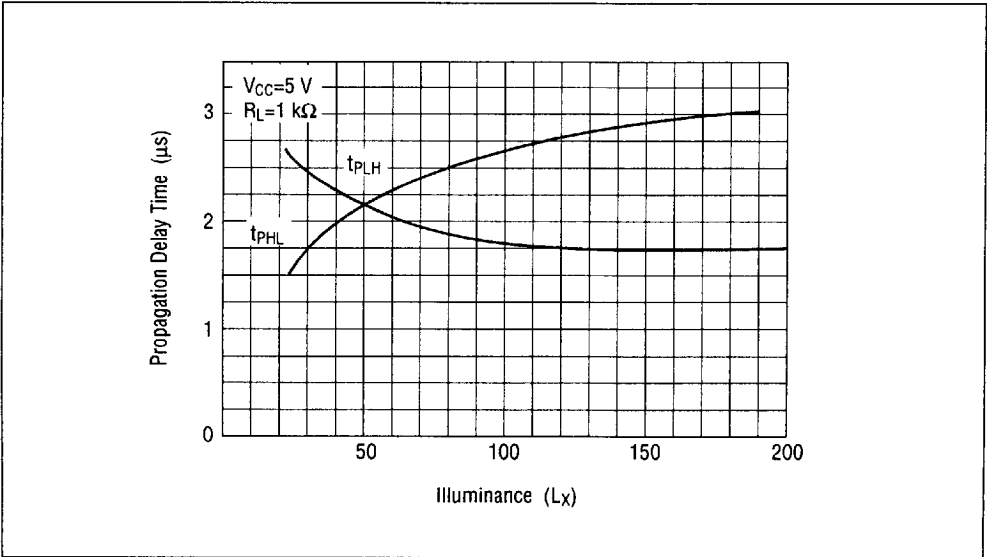
- Supply Current vs. Ambient Temperature



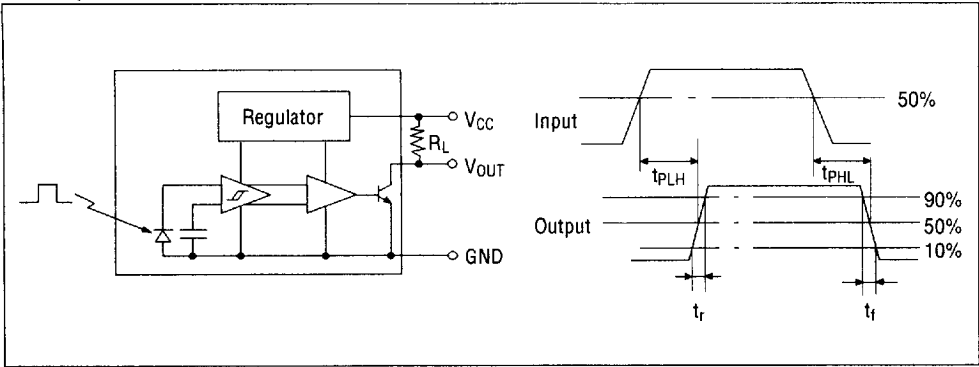
• **Relative Threshold Illuminance vs. Ambient Temperature**



• **Propagation Delay Time vs. Illuminance ($T_a=25^{\circ}C$)**



• Response Time Test Circuit



• Relative Threshold Illuminance vs. Supply Voltage ($T_a=25^{\circ}\text{C}$)

