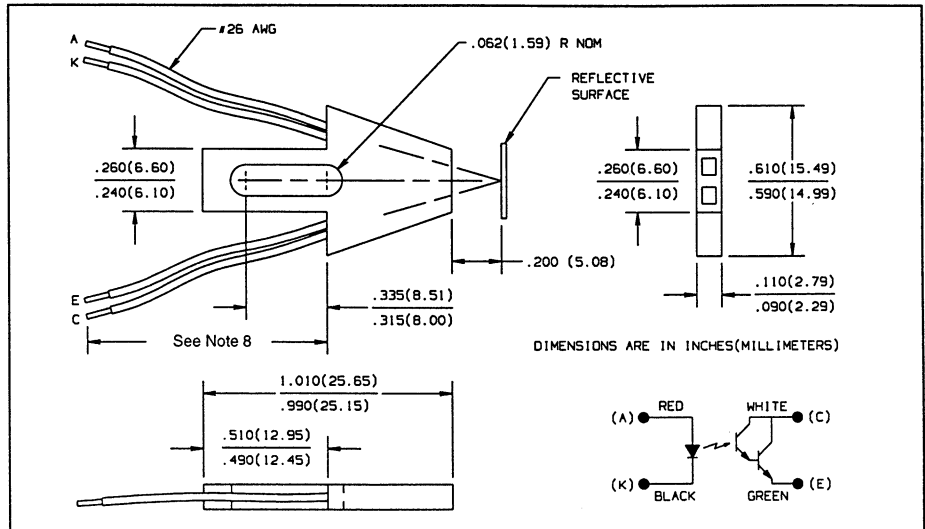
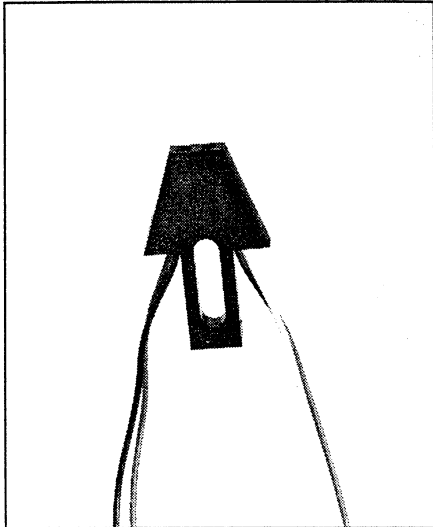


# Reflective Object Sensor Type OPB701, OPB701AL



## Features

- Photodarlington output
- Low profile to facilitate stacking
- Low cost plastic housing
- 4.0 inch minimum length lead wire (OPB701)
- 18.0 inch minimum length lead wire (OPB701AL)

## Description

The OPB701 series consists of an infrared emitting diode and an NPN silicon photodarlington mounted "side-by-side" on converging optical axes, in a black plastic housing. The photodarlington responds to radiation from the emitter only when a reflective object passes within its field of view.

Leads are #26 AWG, teflon insulation, 4.0" minimum length (OPB701) or 18.0" minimum length (OPB701AL), stripped and tinned.

## Absolute Maximum Ratings ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

Storage Temperature Range	.....	$-40^\circ\text{C}$ to $+125^\circ\text{C}$
Operating Temperature Range	.....	$-40^\circ\text{C}$ to $+100^\circ\text{C}$

## Input Diode

Continuous Forward Current	.....	100 mA
Reverse Voltage	.....	2.0 V
Power Dissipation	.....	80 mW <sup>(1)</sup>

## Output Photodarlington

Collector-Emitter Voltage	.....	15 V
Emitter-Collector Voltage	.....	5.0 V
Power Dissipation	.....	50 mW <sup>(2)</sup>

## Notes:

- (1) Derate linearly  $1.07\text{ mW}/^\circ\text{C}$  above  $25^\circ\text{C}$ .
- (2) Derate linearly  $0.67\text{ mW}/^\circ\text{C}$  above  $25^\circ\text{C}$ .
- (3) Measured using Eastman Kodak neutral white test card with 90% diffuse reflectance as a reflecting surface. Reference: Eastman Kodak, Catalog #1257795
- (4) Crosstalk ( $I_{cx}$ ) is the collector current measured with the indicated current in the input diode and with no reflecting surface.
- (5)  $d$  is the distance from the assembly head to the reflective surface.
- (6) Lower curve is based on a calculated worst case condition rather than the conventional  $-2\sigma$  limit.
- (7) All parameters tested using pulse technique.
- (8) 4.0" (101.6 mm) min for OPB701, 18.0" (457.2 mm) min for OPB701AL.

# Type OPB701, OPB701AL

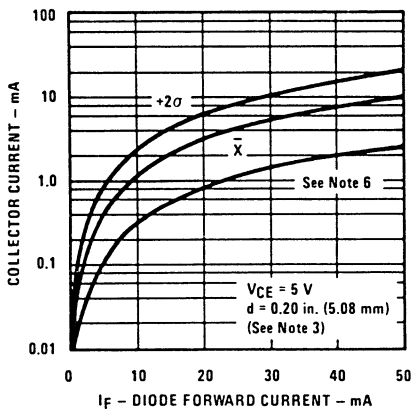
Electrical Characteristics ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

REFLECTIVE OBJECT SENSORS

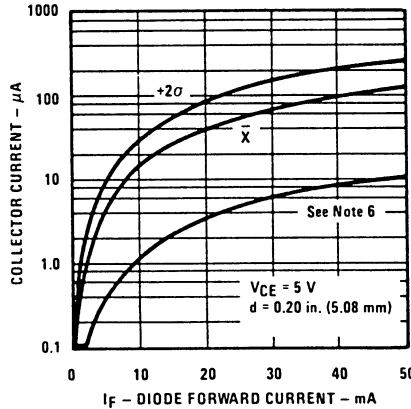
SYMBOL	PARAMETER	MIN	MAX	UNITS	TEST CONDITIONS
<b>Input Diode</b>					
$V_F$	Forward Voltage		1.70	V	$I_F = 50\text{ mA}$
$I_R$	Reverse Current		100	$\mu\text{A}$	$V_R = 2.0\text{ V}$
<b>Output Photodarlington</b>					
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	15		V	$I_C = 100\ \mu\text{A}$
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5.0		V	$I_E = 100\ \mu\text{A}$
$I_{CEO}$	Collector Dark Current		1.00	nA	$V_{CE} = 10\text{ V}, I_F = 0, E_e = \leq 0.100\ \mu\text{W}/\text{cm}^2$
<b>Combined</b>					
$I_{C(ON)}$	On-State Collector Current	2.0		$\mu\text{A}$	$V_{CE} = 5\text{ V}, I_F = 40\text{ mA}, d = 0.200\text{ in. (5.08 mm)}^{(3)(5)}$
$I_{CX}$	Crosstalk		20	$\mu\text{A}$	$V_{CE} = 5\text{ V}, I_F = 40\text{ mA}$ No Reflecting Surface <sup>(4)</sup>
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage		1.10	V	$I_F = 40\text{ mA}, I_C = 1.0\text{ mA}, d = 0.200\text{ in. (5.08 mm)}^{(3)(5)}$

## Typical Performance Curves

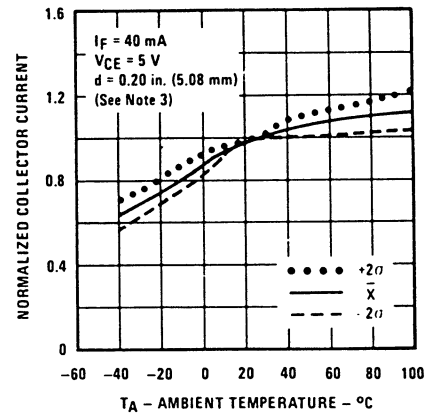
**Reflective Surface Collector Current vs. Diode Forward Current**



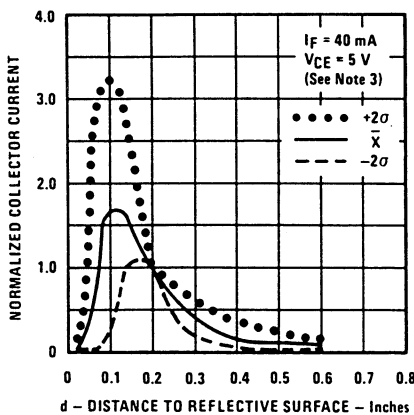
**Diffused Surface Collector Current vs. Diode Forward Current**



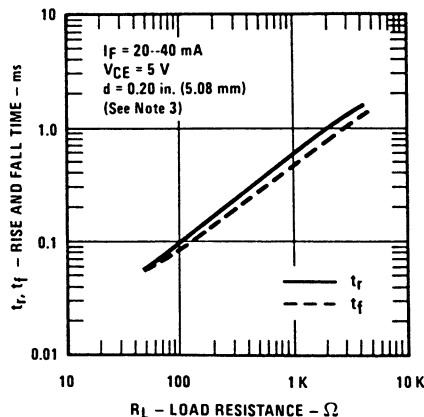
**Normalized Collector Current vs. Ambient Temperature**



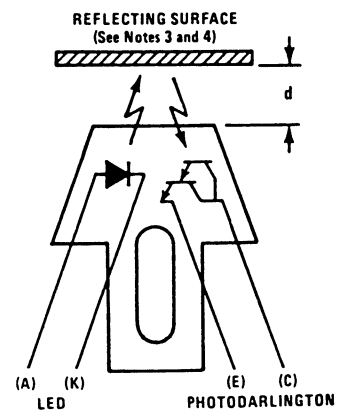
**Normalized Collector Current vs. Object Distance**



**Rise and Fall Time vs. Load Resistance**



**Test Condition**



Optek reserves the right to make changes at any time in order to improve design and to supply the best product possible.

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