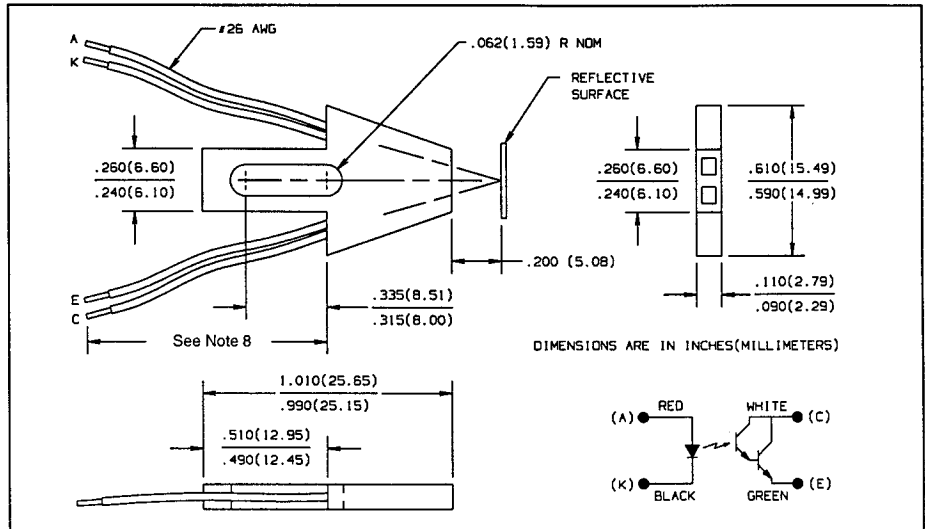
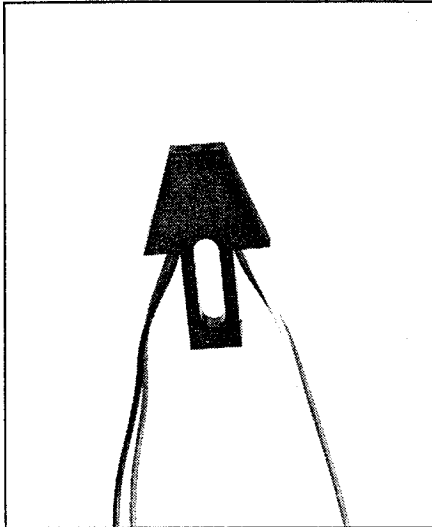


# Reflective Object Sensor Type OPB701, OPB701AL



## 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° C to +125° C
Operating Temperature Range	-40° C to +100° 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 mW/° C above 25° C.
- (2) Derate linearly 0.67 mW/° C above 25° 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.



For RoHS compliant devices add "Z" to the end of the part number: OPB701Z, OPB701ALZ

# Type OPB701, OPB701AL

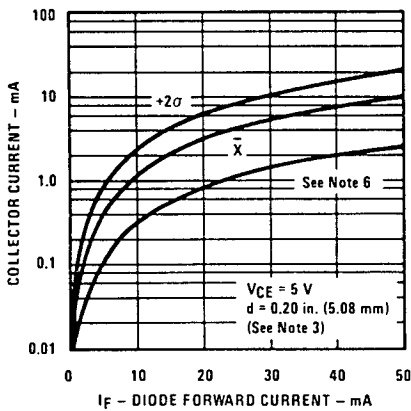
Electrical Characteristics ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

REFLECTIVE OBJECT SENSORS

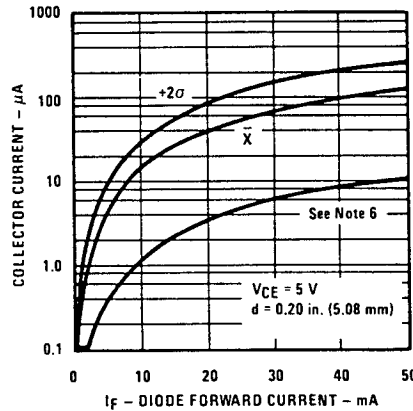
SYMBOL	PARAMETER	MIN	MAX	UNITS	TEST CONDITIONS
<b>Input Diode</b>					
$V_F$	Forward Voltage		1.70	V	$I_F = 50\text{ mA}$
$I_R$	Reverse Current		100	$\mu\text{A}$	$V_R = 2.0\text{ V}$
<b>Output Photodarlington</b>					
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	15		V	$I_C = 100\ \mu\text{A}$
$V_{(BR)ECO}$	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		mA	$V_{CE} = 5\text{ V}, I_F = 40\text{ mA}, d = 0.200\text{ in. (5.08 mm)}$ <sup>(3)(5)</sup>
$I_{CX}$	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	$I_F = 40\text{ mA}, I_C = 1.0\text{ mA}, d = 0.200\text{ in. (5.08 mm)}$ <sup>(3)(5)</sup>

## Typical Performance Curves

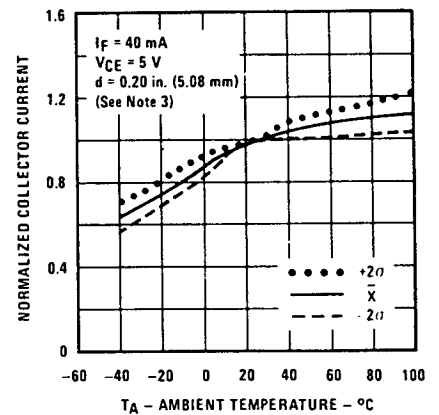
**Reflective Surface Collector Current vs. Diode Forward Current**



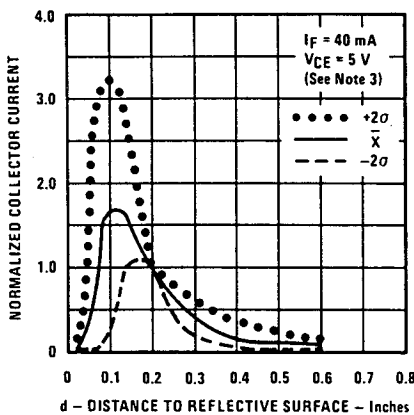
**Diffused Surface Collector Current vs. Diode Forward Current**



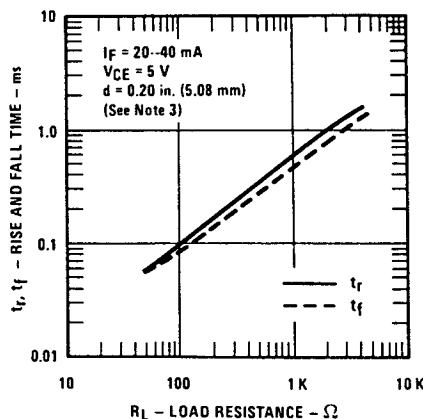
**Normalized Collector Current vs. Ambient Temperature**



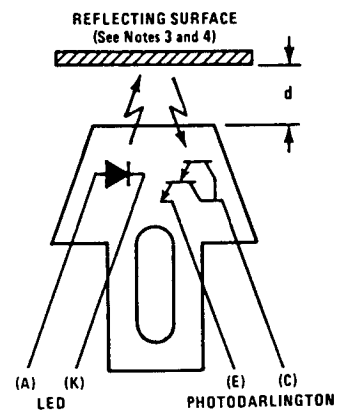
**Normalized Collector Current vs. Object Distance**



**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.

Optek Technology, Inc. 1215 W. Crosby Road Carrollton, Texas 75006 (972)323-2200 Fax (972)323-2396