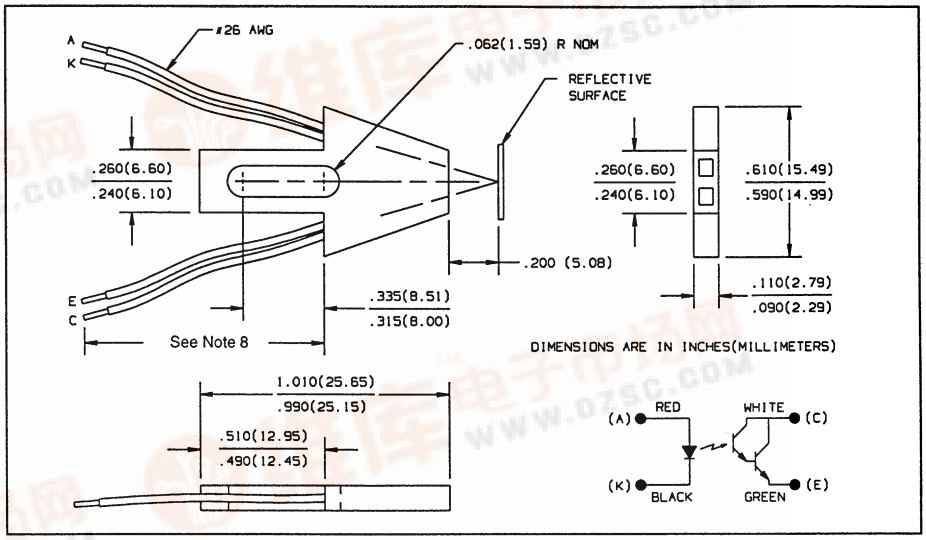
OPTEK

Product Bulletin OPB701
June 1996

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° 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(1)
Output Photodarlington	
Collector-Emitter Voltage	15 V
Emitter-Collector Voltage	5.0 V
Power Dissipation	50 mW(2)

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 -2σ 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.

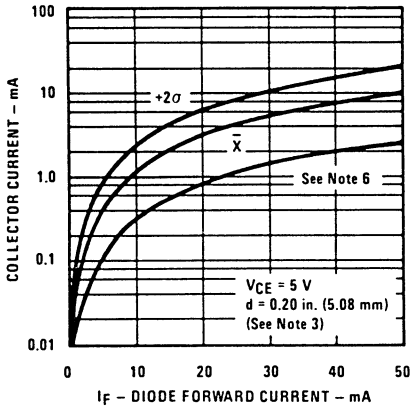
Type OPB701, OPB701AL

Electrical Characteristics (T_A = 25° C unless otherwise noted)

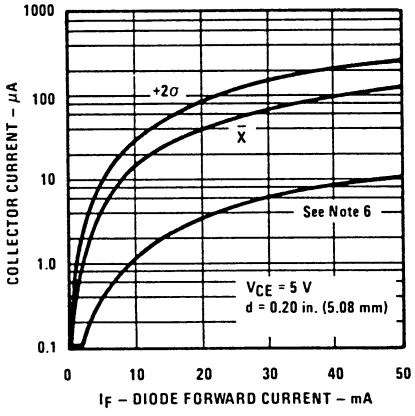
SYMBOL	PARAMETER	MIN	MAX	UNITS	TEST CONDITIONS
Input Diode					
V_F	Forward Voltage		1.70	V	I_F = 50 mA
I_R	Reverse Current		100	µA	V_R = 2.0 V
Output Photodarlington					
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	15		V	I_C = 100 µA
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5.0		V	I_E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

Typical Performance Curves

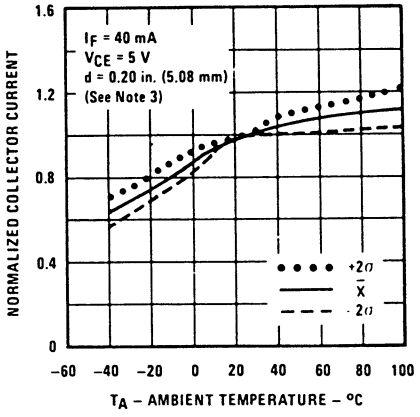
Reflective Surface Collector Current vs. Diode Forward Current



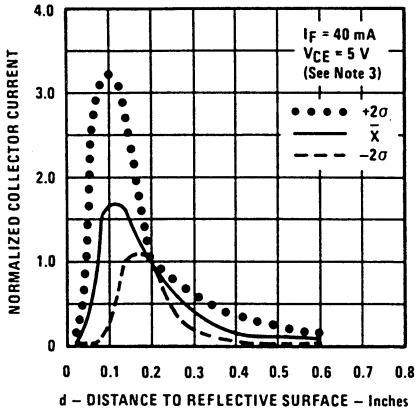
Diffused Surface Collector Current vs. Diode Forward Current



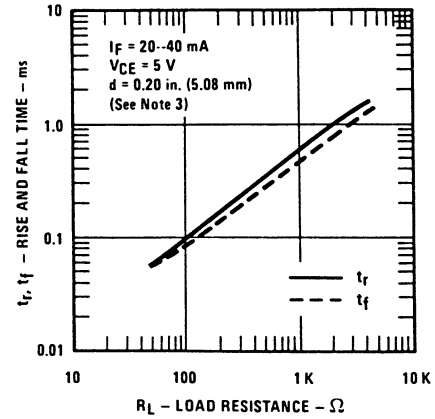
Normalized Collector Current vs. Ambient Temperature



Normalized Collector Current vs. Object Distance



Rise and Fall Time vs. Load Resistance



Test Condition