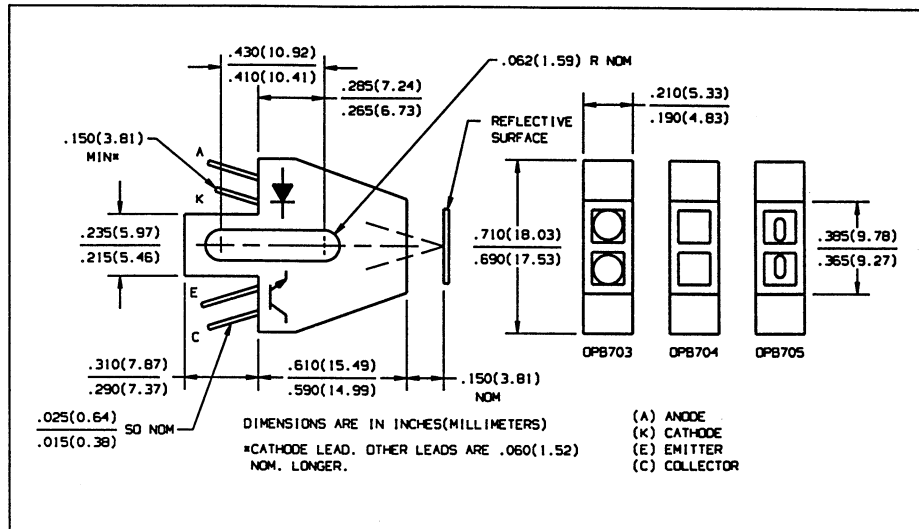
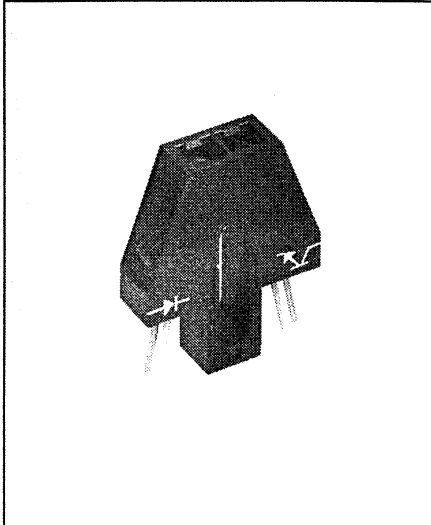


# Reflective Object Sensors

## Types OPB703, OPB704, OPB705



### Features

- Phototransistor output
- High sensitivity
- Low cost plastic housing
- Available with lenses for dust protection and ambient light filtration

### Description

The OPB703, OPB704 and OPB705 each consist of an infrared emitting diode and an NPN silicon phototransistor mounted side-by-side on converging optical axes in a black plastic housing. The phototransistor responds to radiation from the emitter only when a reflective object passes within its field of view. Various options allow no lens, blue polysulfone lens for dust protection or offset lens for improved resolution.

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

Storage and Operating Temperature .....  $-40^\circ\text{C}$  to  $+85^\circ\text{C}$   
Lead Soldering Temperature [1/16 inch (1.6 mm) from case for 5 sec. with soldering iron] .....  $240^\circ\text{C}^{(1)}$

### Input Diode

Forward DC Current ..... 40 mA  
Reverse DC Voltage ..... 2.0 V  
Power Dissipation ..... 100 mW<sup>(2)</sup>

### Output Phototransistor

Collector-Emitter Voltage ..... 30 V  
Emitter-Collector Voltage ..... 5.0 V  
Collector DC Current ..... 25 mA  
Power Dissipation ..... 100 mW<sup>(2)</sup>

### Notes:

- (1) RMA flux is recommended. Duration can be extended to 10 sec. max when flow soldering.
- (2) Derate linearly  $1.67\text{ mW}/^\circ\text{C}$  above  $25^\circ\text{C}$ .
- (3) d is the distance from the assembly face to the reflective surface.
- (4) Lower curve is based on a calculated worst case condition rather than the conventional  $-2\sigma$  limit.
- (5) All parameters tested using pulse technique.
- (6) Crosstalk is the photocurrent measured with current to the input diode and no reflecting surface.
- (7) Measured using Eastman Kodak neutral white test card with 90% diffuse reflectance as a reflecting surface. Reference: Eastman Kodak, Catalog #1257795.

### DESCRIPTION

OPB703	No Lens
OPB704	Blue Polysulfone Lens
OPB705	Offset Lens

# Types OPB703, OPB704, OPB705

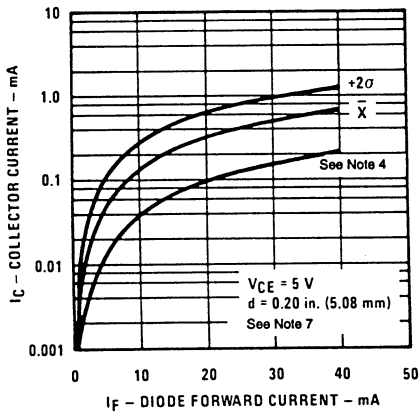
Electrical Characteristics ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

REFLECTIVE OBJECT SENSORS

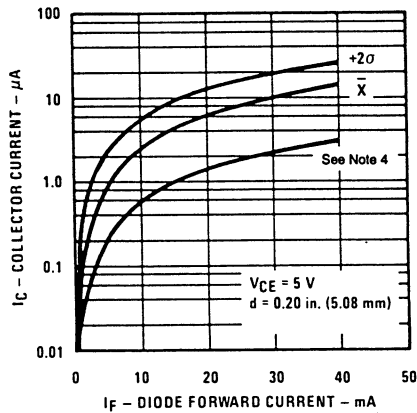
SYMBOL	PARAMETER	MIN	MAX	UNITS	TEST CONDITIONS
<b>Output Diode</b>					
$V_F$	Forward Voltage		1.70	V	$I_F = 40\text{ mA}$
$I_R$	Reverse Current		100	$\mu\text{A}$	$V_R = 2.0\text{ V}$
<b>Output Phototransistor</b>					
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	30		V	$I_{CE} = 100\ \mu\text{A}$
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5.0		V	$I_{EC} = 100\ \mu\text{A}$
$I_{CEO}$	Collector Dark Current		100	nA	$V_{CE} = 10.0\text{ V}, I_F = 0, E_e = 0$
<b>Combined</b>					
$I_{C(ON)}$	On-State Collector Current	OPB703 OPB704 OPB705	200 200 100	$\mu\text{A}$ $\mu\text{A}$ $\mu\text{A}$	$V_{CE} = 5.0\text{ V}, I_F = 40\text{ mA}, d = 0.15\text{ inch (3.81 mm)}$ <sup>(3)(7)</sup>
$I_{CX}$	Crosstalk	OPB703 OPB704 OPB705	20 20 10	$\mu\text{A}$ $\mu\text{A}$ $\mu\text{A}$	$V_{CE} = 5.0\text{ V}, I_F = 40\text{ mA}$ <sup>(6)</sup>

## Typical Performance Curves

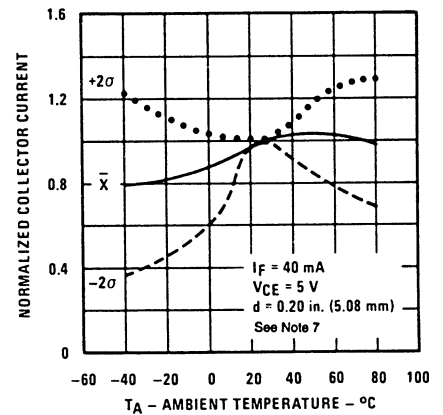
**Reflective Surface Collector Current vs. Diode Forward Current**



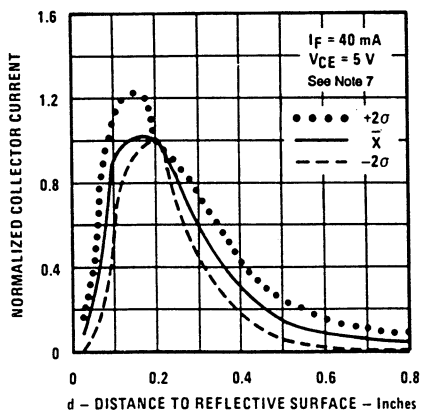
**Diffused Surface Collector Current vs. Diode Forward Current**



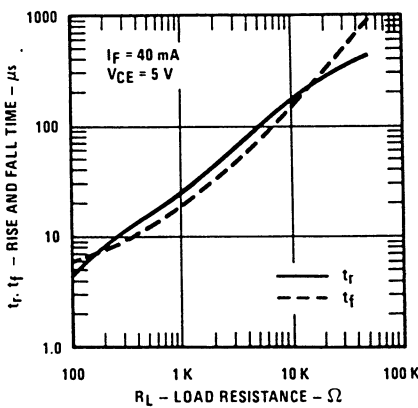
**Normalized Collector Current vs. Ambient Temperature**



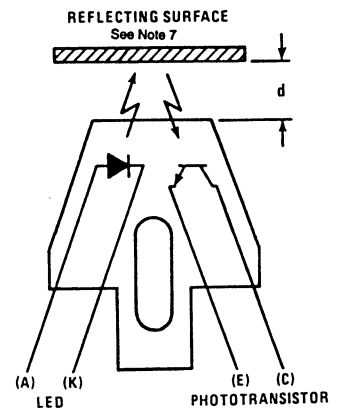
**Normalized Collector Current vs. Object Distance**



**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.

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