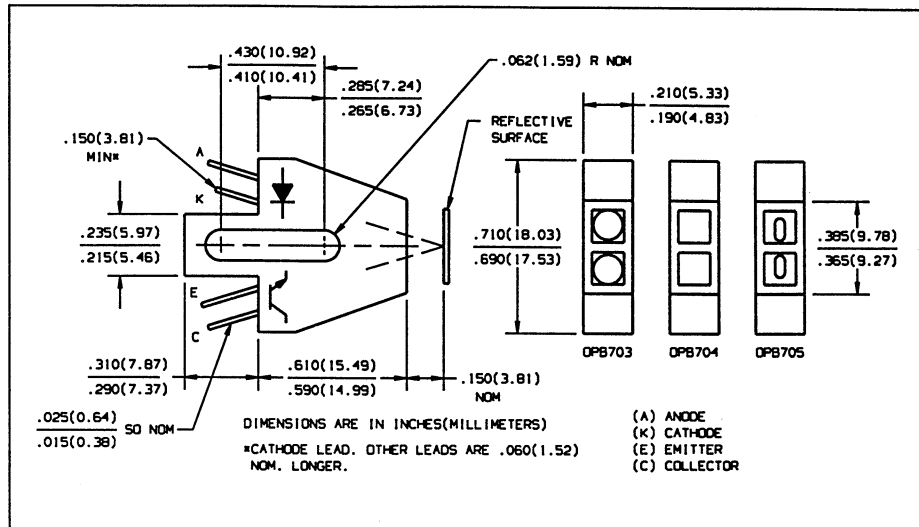
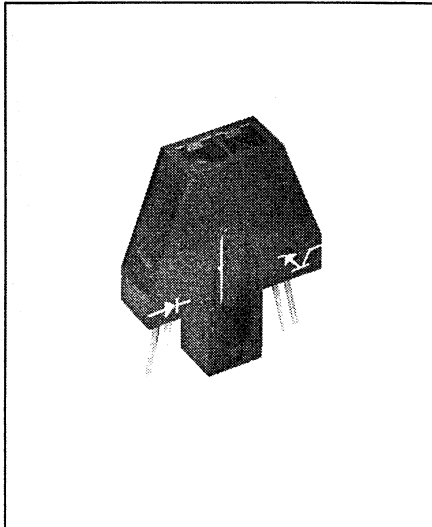


# Reflective Object Sensors

## 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

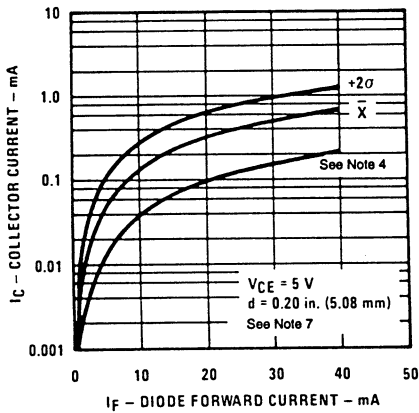
Electrical Characteristics ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

REFLECTIVE OBJECT SENSORS

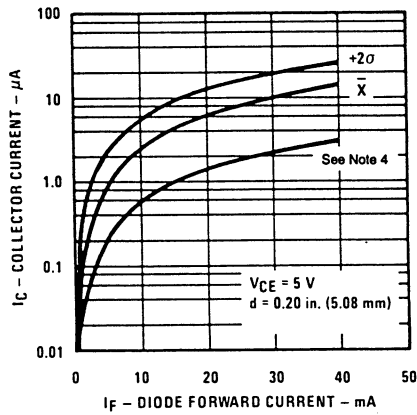
SYMBOL	PARAMETER	MIN	MAX	UNITS	TEST CONDITIONS
<b>Output Diode</b>					
$V_F$	Forward Voltage		1.70	V	$I_F = 40\text{ mA}$
$I_R$	Reverse Current		100	$\mu\text{A}$	$V_R = 2.0\text{ V}$
<b>Output Phototransistor</b>					
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	30		V	$I_{CE} = 100\ \mu\text{A}$
$V_{(BR)ECO}$	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

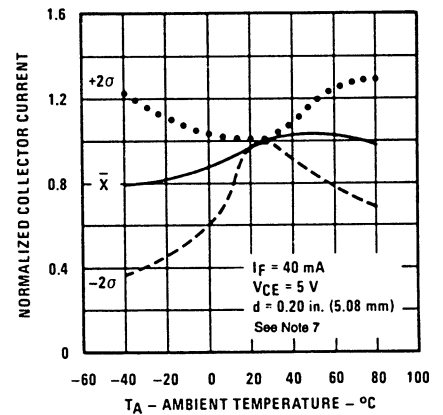
Reflective Surface Collector Current vs. Diode Forward Current



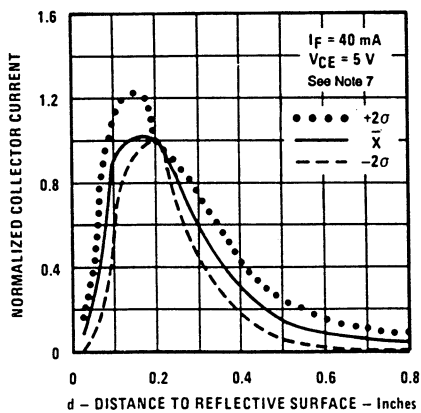
Diffused Surface Collector Current vs. Diode Forward Current



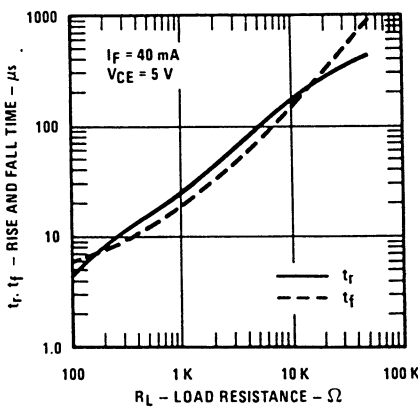
Normalized Collector Current vs. Ambient Temperature



Normalized Collector Current vs. Object Distance



Rise and Fall Time vs. Load Resistance



Test Condition

