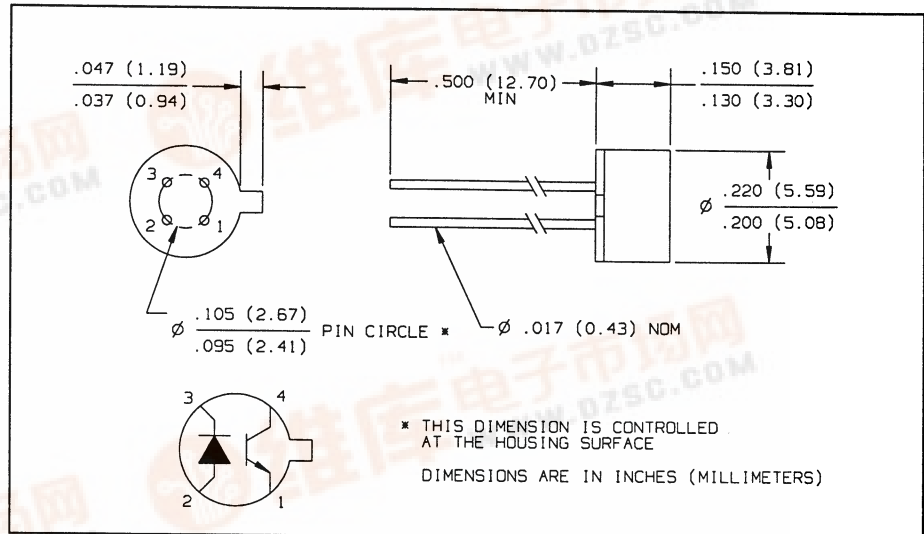
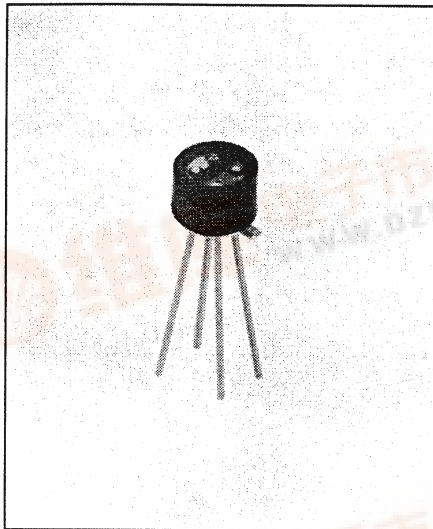


Product Bulletin OPB710

June 1996

Reflective Object Sensors Types OPB710, OPB710F



Features

- Phototransistor output
- Unfocused for sensing diffuse surface
- Mounted on standard TO-72 header
- Available in clear encapsulating epoxy (OPB710) or filtered (OPB710F) to reduce the effect of visible or fluorescent light.

Description

The OPB710 and OPB710F each consist of a gallium arsenide infrared emitting diode and an NPN silicon phototransistor. The emitting diode and detector are mounted side by side on parallel axes on a standard TO-72 header. A black plastic sleeve is attached and filled with encapsulating epoxy to cover the emitter and detector. The "F" version has a filtering material added to the epoxy to reduce the effect of ambient light. The package contains an internal barrier which prevents diode emissions from reaching the sensor directly.

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

Storage Temperature	-20°C to $+85^\circ\text{C}$
Operating Temperature Range	0°C to $+70^\circ\text{C}$
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	50 mA
Peak Forward Current (1 μs pulse width, 300 pps)	3.0 A
Reverse DC Voltage	3.0 V
Power Dissipation	75 mW ⁽²⁾

Output Photosensor

Collector-Emitter Voltage	30 V
Emitter-Collector Voltage	5.0 V
Collector DC Current	25 mA
Power Dissipation	150 mW ⁽³⁾

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°C .
- (3) Derate Linearly $3.33\text{ mW}/^\circ\text{C}$ above 25°C .
- (4) Measured using an Eastman Kodak neutral white test card having 90% diffuse reflectance located 0.250 inch (6.35 mm) from the face of the OPB710. Reference: Eastman Kodak, Catalog #1257795.
- (5) Crosstalk (I_{cx}) is the collector current measured with the indicated current on the input diode and with no reflecting surface. Ambient light is excluded with a black box.



Types OPB710, OPB710F

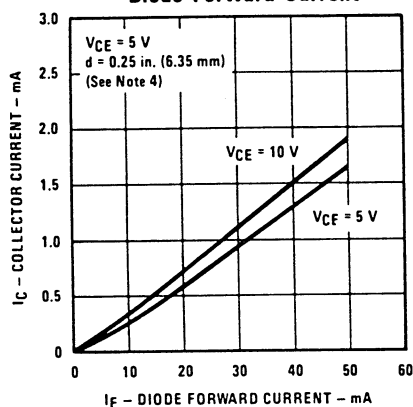
Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

SYMBOL	PARAMETER	MIN	MAX	UNITS	TEST CONDITIONS
Input Diode					
V_F	Forward Voltage		1.50	V	$I_F = 50\text{ mA}$
I_R	Reverse Current		100	μA	$V_R = 3.0\text{ V}$
Output Phototransistor					
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	30		V	$I_C = 1.00\text{ mA}$
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5.0		V	$I_E = 100\text{ }\mu\text{A}$
I_{CEO}	Collector Dark Current		100	nA	$V_{CE} = 5\text{ V}$, $I_F = 0$, $E_e \leq 0.1\text{ }\mu\text{W/cm}^2$
Combined					
$I_{C(ON)}$	On-State Collector Current	150		μA	$V_{CE} = 5\text{ V}$, $I_F = 50\text{ mA}$, $d = 0.250\text{ in. (6.35 mm)}$ ⁽⁴⁾
I_{CX}	Crosstalk		100	nA	$V_{CE} = 5\text{ V}$, $I_F = 50\text{ mA}$, No Reflecting Surface ⁽⁵⁾

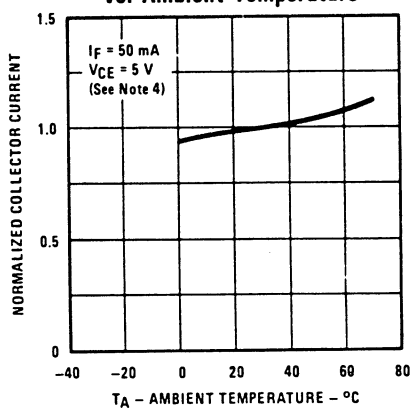
REFLECTIVE
OBJECT
SENSORS

Typical Performance Curves

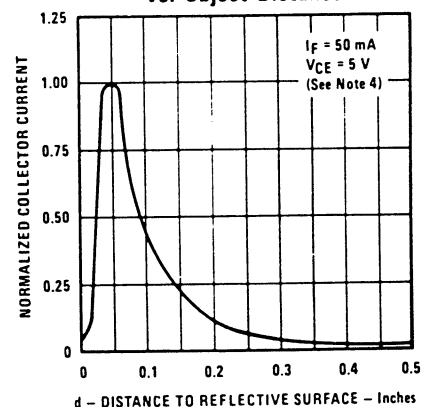
Collector Current vs.
Diode Forward Current



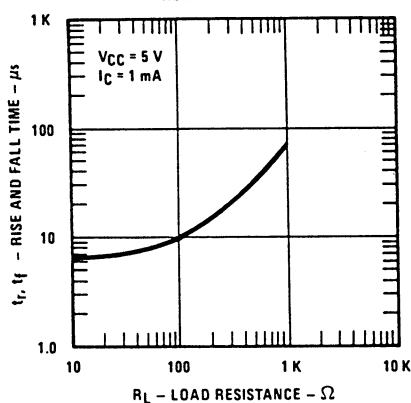
Normalized Collector Current
vs. Ambient Temperature



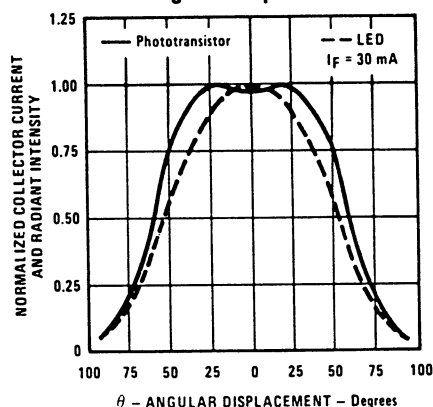
Normalized Collector Current
vs. Object Distance



Rise and Fall Time vs.
Load Resistance



LED and Phototransistor
Angular Displacement



Test Condition

