

# Reflective Object Sensor

OPB700Z, OPB700ALZ

OPB701Z, OPB701ALZ



## Features:

- Low profile to facilitate stacking
- Low cost plastic housing
- Choice of phototransistor or photodarlington output
- #26 AWG lead wire in 4" (101 mm), or 18" (457 mm) lengths

## Description:

**OPB700** and **OPB700ALZ** sensors consist of an infrared emitting diode and a NPN silicon phototransistor, mounted side-by-side on converging optical axes in a black plastic housing.

**OPB701** and **OPB701ALZ** sensors consist of an infrared emitting diode and a NPN silicon photodarlington, mounted side-by-side on converging optical axes in a black plastic housing.

The interconnect wires for these devices are UL approved #26 AWG, with Teflon insulation, stripped and tinned. The **OPB700** and **OPB701** have 4" (101 mm) wire length while the **OPB700ALZ** and **OPB701ALZ** have 18" (457 mm) wire length.

Custom electrical, wire, cabling and connectors are available. Contact your local representative or OPTEK for more information.

## Applications:

- Non-contact reflective object sensor
- Assembly line automation
- Machine automation
- Machine safety
- End of travel sensor
- Door sensor

Ordering Information				
Part Number	LED Peak Wavelength	Sensor	Reflection Distance Inch (mm)	Lead Length / Spacing
OPB700Z	890 nm	Transistor	0.200" (5.08mm)	4" / 26 AWG Wire
OPB700ALZ				18" / 26 AWG Wire
OPB701Z		Darlington		4" / 26 AWG Wire
OPB701ALZ				18" / 26 AWG Wire



RoHS

### General Note

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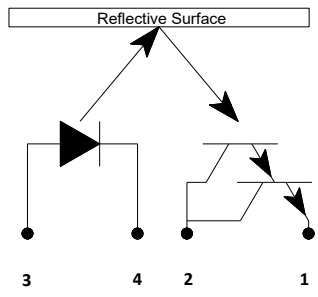
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## OPB700Z, OPB701Z



Part Number	Wire Length
OPB700Z	4" Min
OPB700ALZ	18" Min
OPB701Z	4" Min
OPB701ALZ	18" Min

OPB701			
Color/Pin #	LED	Color/Pin #	LED
Red-3	Anode	White-2	Collector
Black-4	Cathode	Green-1	Emitter

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## Electrical Specifications

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
Lead Soldering Temperature	260° C
<b>Input Diode</b>	
Continuous Forward Current	100 mA
Reverse Voltage	2 V
Power Dissipation <sup>(1)</sup>	80 mW
<b>Output Phototransistor</b>	
Collector-Emitter Voltage OPB700Z, OPB700ALZ OPB701Z, OPB701ALZ	24 V 15 V
Emitter-Collector Voltage	5 V
Power Dissipation <sup>(1)</sup>	50 mW

Notes:

(1) Derate linearly 1.07 mW/°C above 25 ° C.

Electrical Characteristics ( $T_A = 25^\circ\text{C}$ unless otherwise noted)						
SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
<b>Input Diode</b>						
$V_F$	Forward Voltage	-	-	1.7	V	$I_F = 50\text{ mA}$
$I_R$	Reverse Current	-	-	100	$\mu\text{A}$	$V_R = 2\text{ V}$
<b>Output Phototransistor</b>						
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	25	-	-	V	$I_C = 100\ \mu\text{A}$
	OPB700Z, OPB700ALZ OPB701Z, OPB701ALZ	15	-	-	V	$I_C = 100\ \mu\text{A}$
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5	-	-	V	$I_E = 100\ \mu\text{A}$
$I_{CEO}$	Collector Dark Current	-	-	100	nA	$V_{CE} = 10\text{ V}, I_F = 0, E_E = \leq 0.1\ \mu\text{W}/\text{cm}^2$
	OPB700Z, OPB700ALZ OPB701Z, OPB701ALZ	-	-	250	nA	$V_{CE} = 10\text{ V}, I_F = 0, E_E = \leq 0.1\ \mu\text{W}/\text{cm}^2$

Notes:

(1) Measured using Eastman Kodak neutral white test card with 90% diffuse reflectance as a reflecting surface. Reference: Eastman Kodak, Catalog # E 152 7795.

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## Electrical Specifications

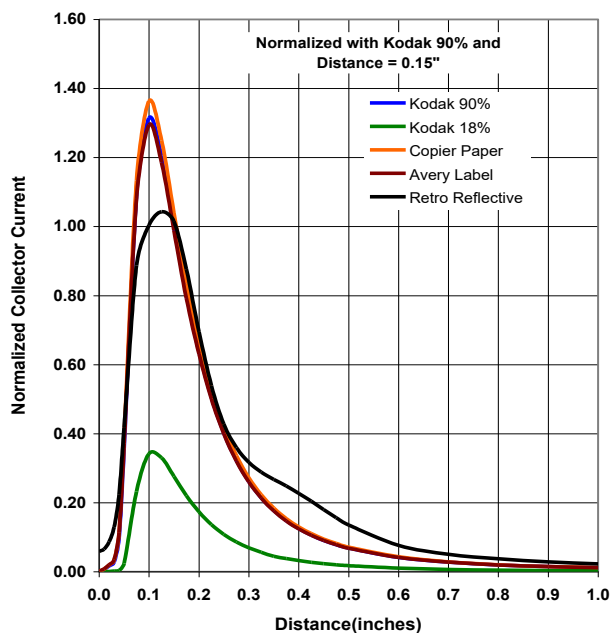
Electrical Characteristics ( $T_A = 25^\circ\text{C}$ unless otherwise noted)						
SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
<b>Coupled Parameters OPB700Z, OPB700ALZ (Phototransistor)</b>						
$I_{C(ON)}$	Collector current	0.10	-	2.50	mA	$V_{CE} = 5.0\text{V}^{(1)}$ , $I_F = 40\text{mA}$
$V_{CE(SAT)}$	Saturation Voltage	-	-	0.40	V	$I_C = 10\mu\text{A}$ , $I_F = 40\text{mA}$
$I_{CX}$	Leakage Current	-	-	2.00	$\mu\text{A}$	$V_{CE} = 5.0\text{V}$ , $I_F = 40\text{mA}$ , NO Reflective Surface
<b>Coupled Parameters OPB701Z, OPB701ALZ (Photodarlington)</b>						
$I_{C(ON)}$	Collector current	2.50	-	43.00	mA	$V_{CE} = 5.0\text{V}^{(1)}$ , $I_F = 40\text{mA}$
$V_{CE(SAT)}$	Saturation Voltage	-	-	1.10	V	$I_C = 1.0\text{mA}$ , $I_F = 40\text{mA}$
$I_{CX}$	Leakage Current	-	-	20.0	$\mu\text{A}$	$V_{CE} = 5.0\text{V}$ , $I_F = 40\text{mA}$ , NO Reflective Surface

Notes:

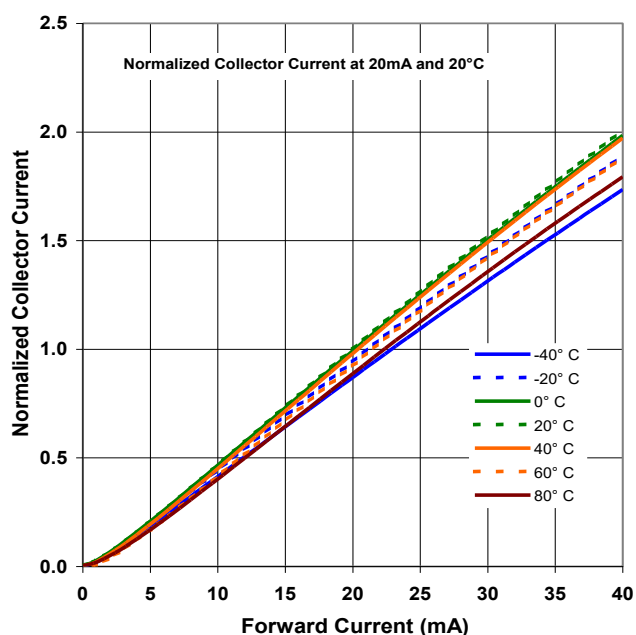
- Measured using Eastman Kodak neutral white test card with 90% diffuse reflectance as a reflecting surface. Reference: Eastman Kodak, Catalog # E 152 7795.

## Performance

**OPB700 - Normalized Collector Current vs Distance**



**OPB700 - Normalized Collector Current vs Forward Current vs Temperature**



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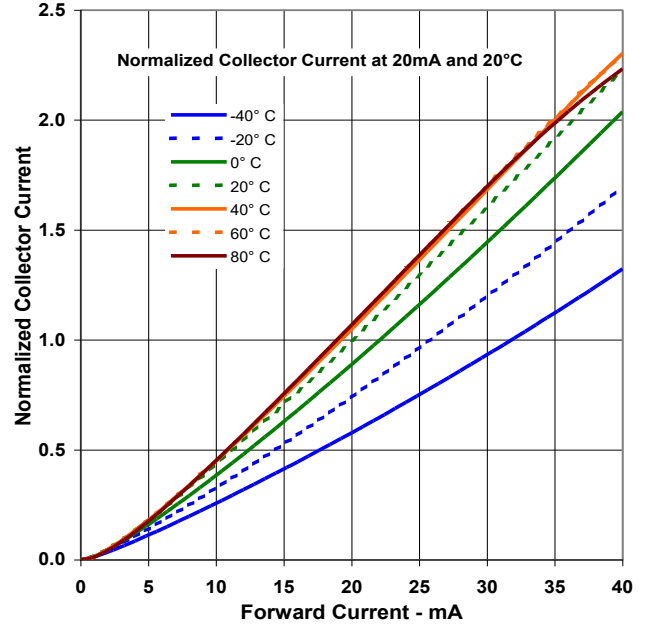


## Performance

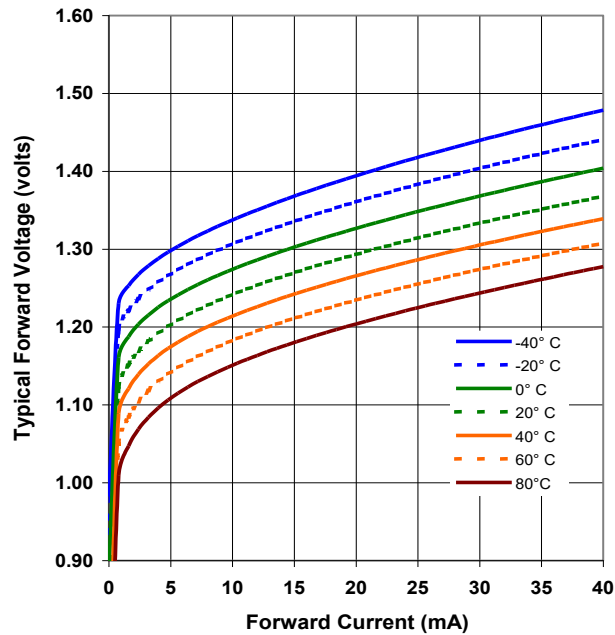
OPB701 - Normalized Collector Current vs Distance



OPB701 - Normalized Collector Current vs Forward Current vs Temperature



LED—Forward Voltage vs Forward Current vs Temperature



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