

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 UL rated lead wire in 4" (101 mm), or 18" (457 mm) lengths

Description:

OPB700Z 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.

OPB701Z 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 rated #26 AWG, with Teflon insulation, stripped and tinned. The **OPB700Z** and **OPB701Z** have 4" (101 mm) length wire while the **OPB700ALZ** and **OPB701ALZ** have 18" (457 mm) length wire.

For application information, See Application Bulletins 248 and 213.

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" (5.08 mm)	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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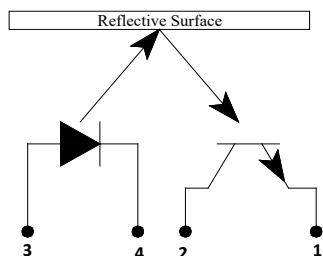
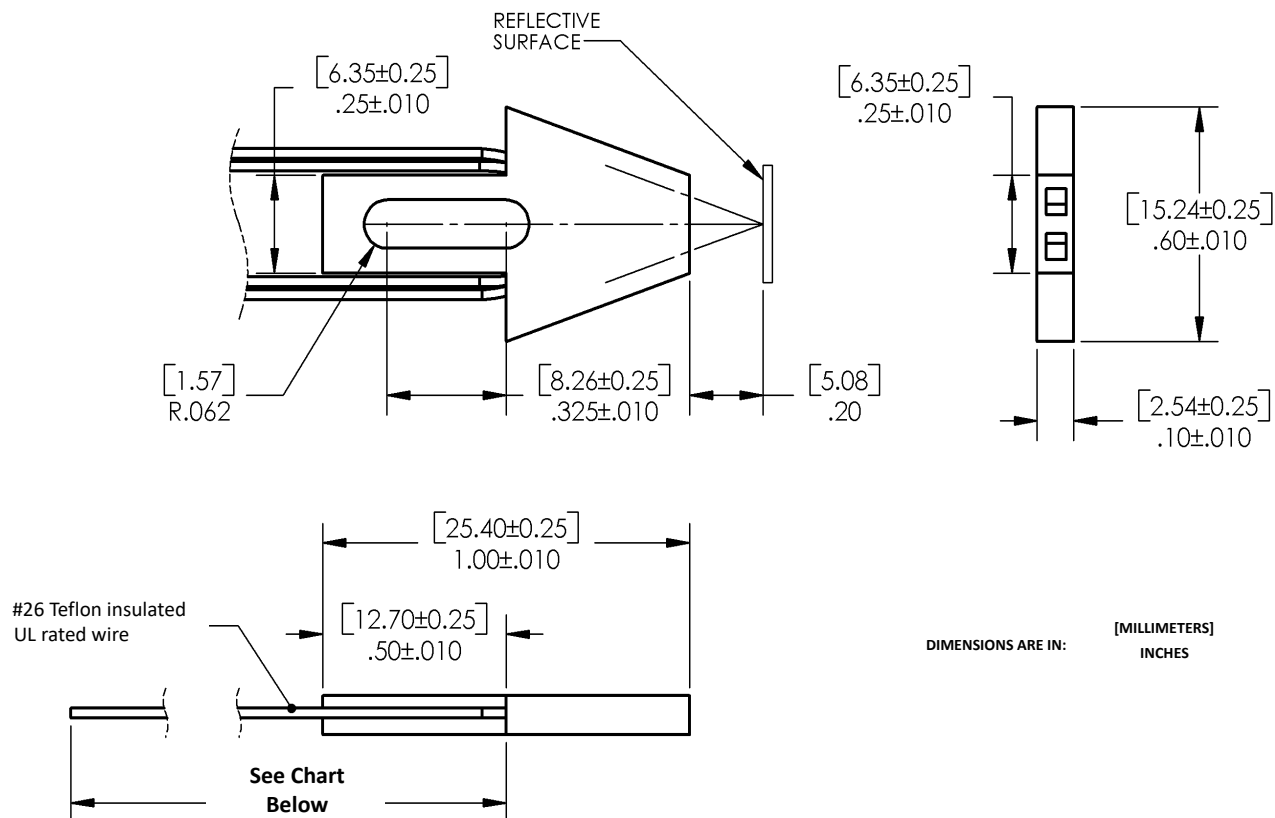
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Reflective Object Sensor

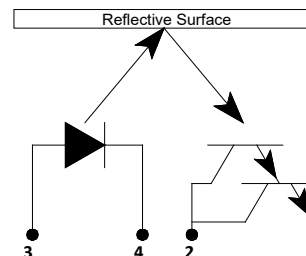
OPB700Z, OPB700ALZ, OPB701Z, OPB701ALZ



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



Color / Pin #	LED	Color / Pin #	Sensor
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
Input Diode	
Continuous Forward Current	100 mA
Reverse Voltage	2 V
Power Dissipation ⁽¹⁾	150 mW
Output Phototransistor & Photodarlington	
Collector-Emitter Voltage OPB700Z, OPB700ALZ OPB701Z, OPB701ALZ	24 V 15 V
Emitter-Collector Voltage	5 V
Power Dissipation ⁽²⁾	100 mW

Notes:

- (1) Derate linearly 1.73 mW/° C above 25° C.
 (2) 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
Input Diode						
V_F	Forward Voltage	1.0	-	1.7	V	$I_F = 50\text{ mA}$
I_R	Reverse Current	-	-	100	μA	$V_R = 2\text{ V}$
Output Phototransistor						
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage OPB700Z, OPB700ALZ OPB701Z, OPB701ALZ	25 15	- -	- -	V	$I_C = 100\text{ }\mu\text{A}$
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5	-	-	V	$I_E = 100\text{ }\mu\text{A}$
I_{CEO}	Collector Dark Current OPB700Z, OPB700ALZ OPB701Z, OPB701ALZ	- -	- -	100 250	nA	$V_{CE} = 10\text{ V}, I_F = 0, E_E = \leq 0.1\text{ }\mu\text{W/cm}^2$
Coupled Parameters OPB700Z, OPB700ALZ (Phototransistor)						
$I_{C(ON)}^{(1)}$	Collector Current	0.10	-	2.50	mA	$V_{CE} = 5.0\text{ V}, I_F = 40\text{ mA}$
$V_{CE(SAT)}^{(1)}$	Saturation Voltage	-	-	0.40	V	$I_C = 10\text{ }\mu\text{A}, I_F = 40\text{ mA}$
I_{CX}	Leakage Current	-	-	2.00	μA	$V_{CE} = 5.0\text{ V}, I_F = 40\text{ mA},$ NO Reflective Surface
Coupled Parameters OPB701Z, OPB701ALZ (Photodarlington)						
$I_{C(ON)}^{(1)}$	Collector Current	2.50	-	43.0	mA	$V_{CE} = 5.0\text{ V}, I_F = 40\text{ mA}$
$V_{CE(SAT)}^{(1)}$	Saturation Voltage	-	-	1.10	V	$I_C = 1.0\text{ mA}, I_F = 40\text{ mA}$
I_{CX}	Leakage Current	-	-	20.0	μA	$V_{CE} = 5.0\text{ V}, I_F = 40\text{ mA},$ NO Reflective Surface

Notes:

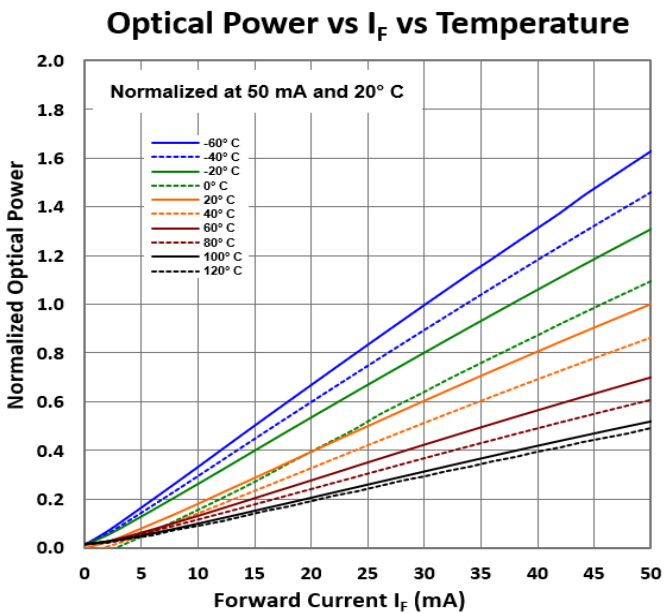
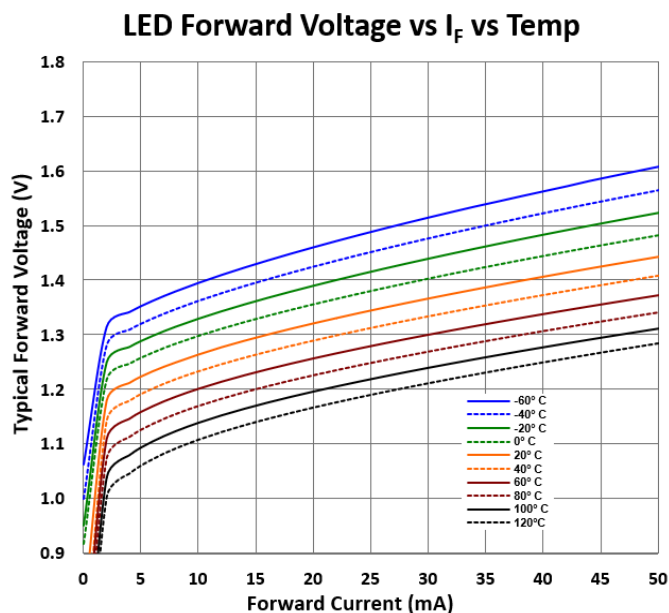
- (1) Measured using Eastman Kodak neutral white test card with 90% diffuse reflectance as a reflecting surface.
 Reference: Eastman Kodak, Catalog # E 152 7795.

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Typical Performance OPB700, OPB701



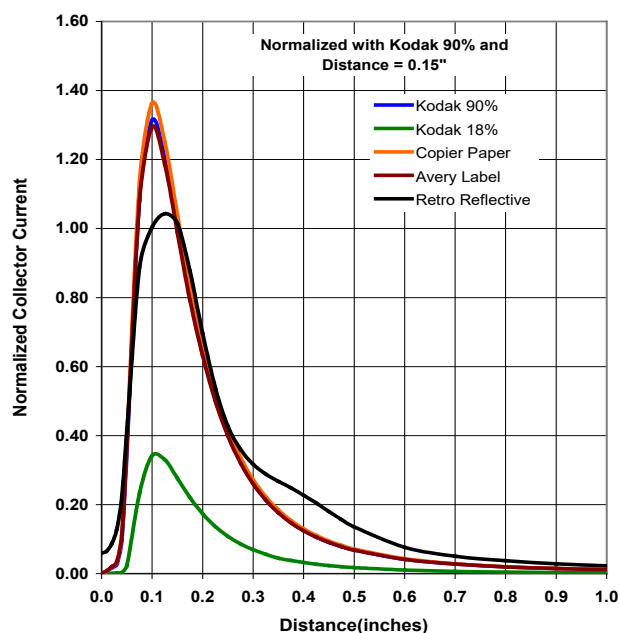
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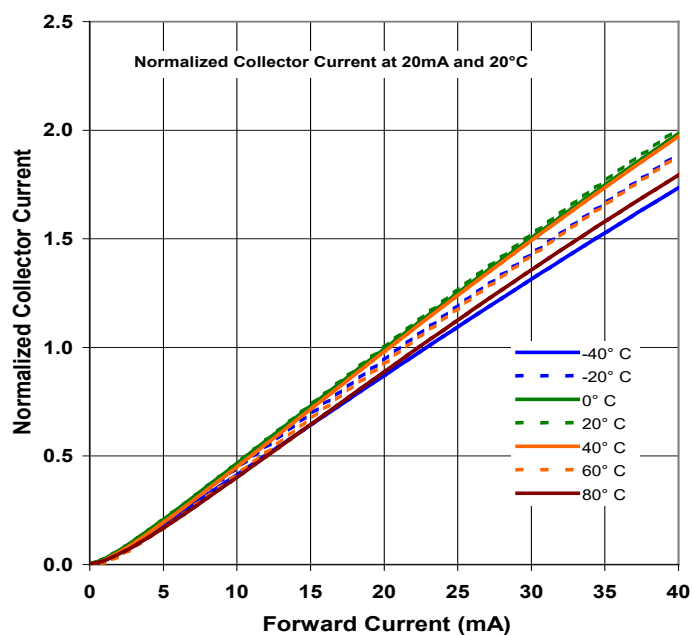
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Typical Performance OPB700

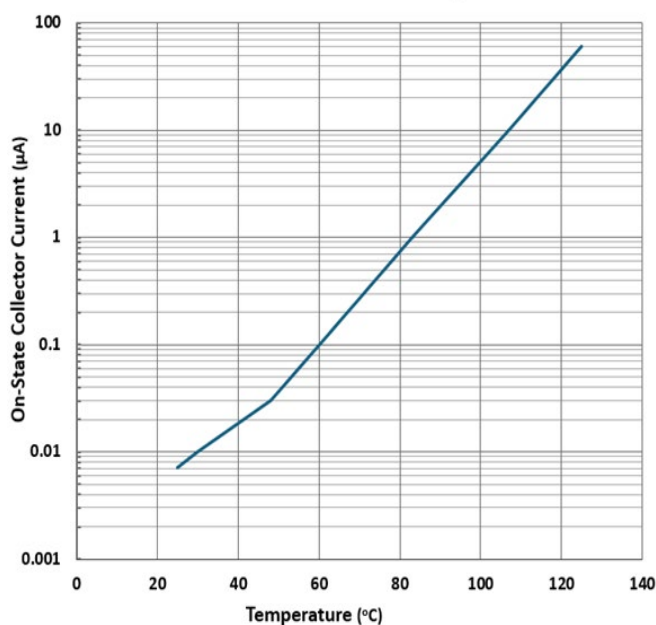
OPB700 - Normalized Collector Current
vs Distance



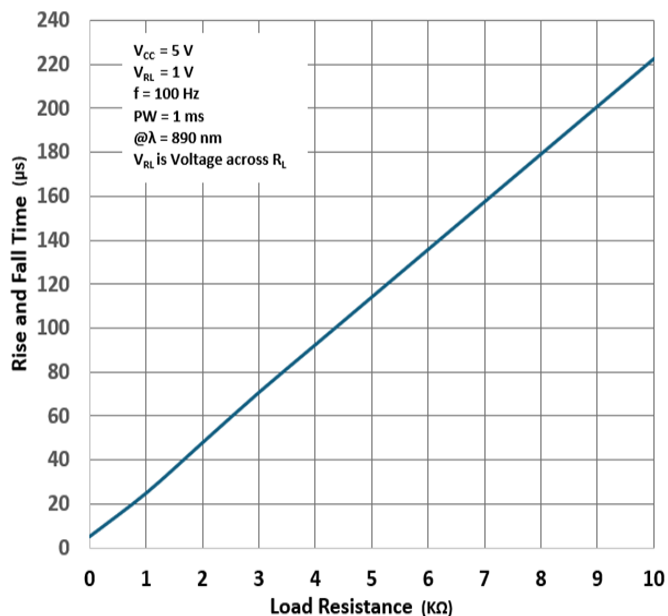
OPB700 - Normalized Collector Current
vs Forward Current vs Temperature



Collector Dark Current vs Temperature



Rise and Fall Times vs Load Resistance



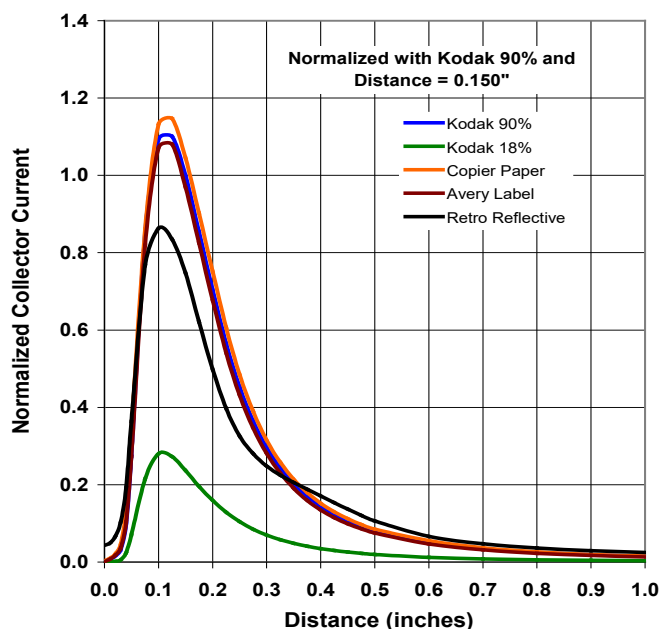
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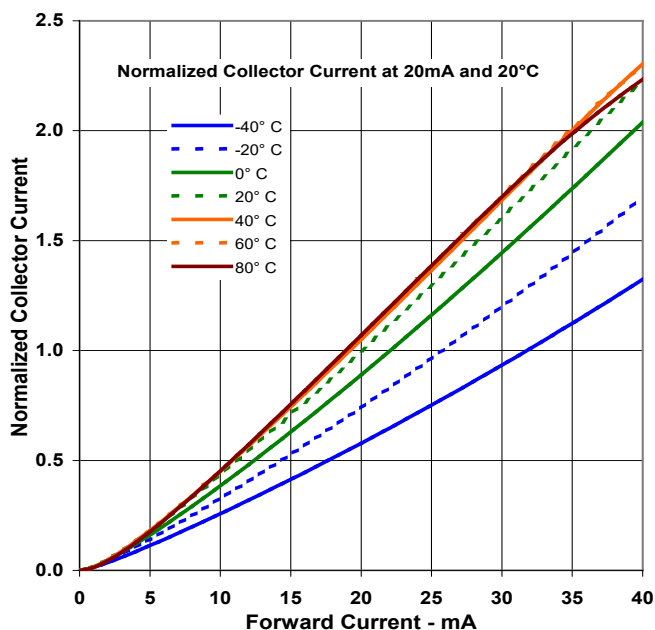
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Typical Performance OPB701

OPB701 - Normalized Collector Current
vs Distance



OPB701 - Normalized Collector Current
vs Forward Current vs Temperature



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