Reflective Object Sensor

OPB708, OPB740 Series, OPB740WZ Series

Obsolete (OPB709, OPB741, OPB746WZ & OPB747WZ)



OPB708, OPB740, OPB745 Series



OPB7_ _WZ Series

Features:

- Focused for maximum sensitivity
- Phototransistor or photodarlington output
- Crosstalk does not exceed specified I_{CEO}
- 24” (610 mm) wire length
- 26 AWG wire size

Description:

Each reflective object sensor in the **OPB708**, **OPB740** through **OPB745** and **OPB740WZ** through **OPB745WZ** series consists of an infrared emitting diode and a NPN silicon phototransistor or a photodarlington. The **OPB748WZ** consists of a Red visible LED and an NPN silicon phototransistor. The Red LED allows better contrast ratio when detecting Black marks on a White surface. All these devices are mounted side-by-side on converging optical axes in a black plastic housing focusing on a small area and depth of field.

OPB7 _ _ WZ series are wired (UL approved wire) devices that offer various lens options, including no windows, blue polysulfone windows for dust protection or opaque aperture windows with offset openings for improved target resolution.

On each sensor included in this data sheet, the photosensor responds to radiation only when a reflective object passes within its field of view.

Custom $I_{C(ON)}$ current binning, special wire lengths and connectorization is available through your OPTEK rep.

Applications:

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

CONTAINS POLYSULFONE

Some adhesives may cause stress cracking in polysulfone. We suggest the use of a low viscosity, fast fixture time adhesive such as ND Industries **Vibra-Tite 325** for thread-locking applications with our molded plastics.

RoHS

Part Number	LED Peak Wavelength	Sensor	Reflection Distance Inch (mm)	Lead Length/ Wire Type
OPB708	935 nm	Transistor	Min=0.08” [2.04 mm] Typ=0.15" [3.81 mm] Max=0.30” [7.62 mm]	0.150" Minimum
OPB709 (Obsolete)		Darlington		
OPB740	890 nm	Transistor		
OPB741 (Obsolete)				
OPB742				
OPB743				
OPB744				
OPB745		Darlington		
OPB740WZ		Transistor		24" / 26 AWG Wire
OPB741WZ				
OPB742WZ				
OPB743WZ				
OPB744WZ				
OPB745WZ		Darlington		
OPB746WZ (Obsolete)	935 nm	R_{BE} Transistor		
OPB747WZ (Obsolete)	660 nm			
OPB748WZ		Transistor		

General Note

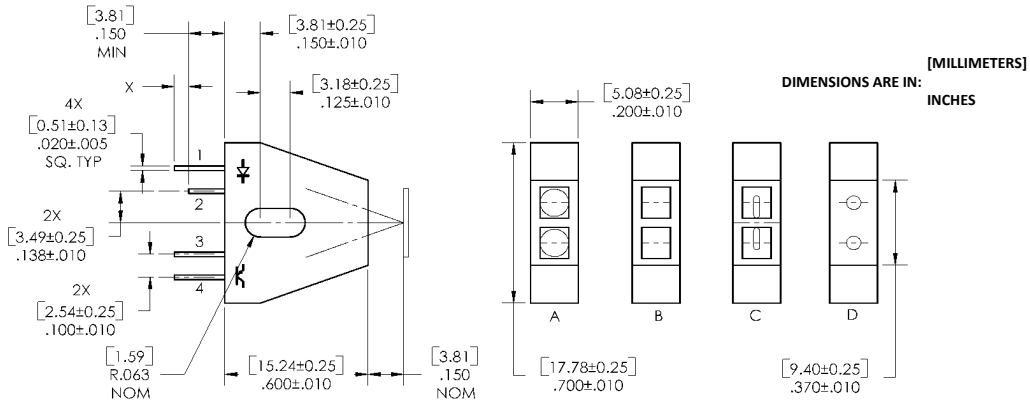
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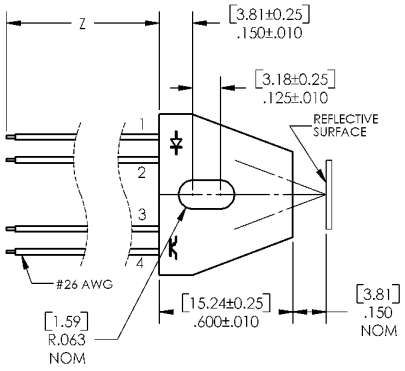
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Electrical Specifications

OPB708, OPB740,
OPB742, OPB743, OPB744, OPB745

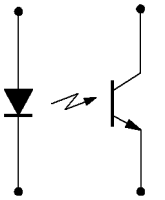


OPB740WZ, OPB741WZ, OPB742WZ, OPB743WZ,
OPB744WZ, OPB745WZ, OPB748WZ

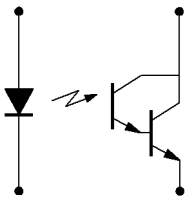


Package Style	
Part Number	**Lens Configuration**
OPB708	D - No windows
OPB740	A - No windows
OPB740WZ	A - No windows
OPB741WZ	B - Blue windows
OPB742	C - Offset windows
OPB742WZ	C - Offset windows
OPB743	A - No windows
OPB743WZ	A - No windows
OPB744	B - Blue windows
OPB744WZ	B - Blue windows
OPB745	C - Offset windows
OPB745WZ	C - Offset windows
OPB748WZ	C - Offset windows

OPB708
OPB740 thru **OPB744**
OPB740WZ thru **OPB748WZ**



OPB745,
OPB745WZ



Color-PIN #	LED	Color-PIN #	Transistor
Orange-1	Anode	White-4	Collector
Green-2	Cathode	Blue-3	Emitter

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Electrical Specifications

Absolute Maximum Ratings (T_A = 25° C unless otherwise noted)	
Operating and Storage Temperature Range OPB708, OPB740, OPB742, OPB743, OPB744, OPB745 OPB741WZ, OPB742WZ, OPB743WZ, OPB744WZ, OPB745WZ, OPB748WZ	 -40° C to +85° C -40° C to +80° C
Lead Soldering Temperature [1/16 inch (1.6 mm) from the case for 5 sec. with soldering iron][1]	260° C
Input Diode	
Forward DC Current	40 mA
Reverse DC Voltage	2 V
Power Dissipation[2]	100 mW
Sensor Output	
Collector-Emitter Voltage OPB708 OPB740, OPB742, OPB743, OPB744 OPB740WZ, OPB741WZ, OPB742WZ, OPB743WZ, OPB744WZ, OPB748WZ OPB745 OPB745WZ	 30 V 30 V 30 V 15 V 15 V
Emitter-Collector Voltage OPB708 through OPB745, OPB748	 5.0 V
Power Dissipation[2]	100 mW

Notes:
1. RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering.
2. Derate linearly 1.33 mW ° C above 25° C.

Electrical Characteristics (T_A = 25° C unless otherwise noted)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
660 nm LED						
V_F	Forward Voltage	-	-	2.6	V	I_F = 20 mA
I_R	Reverse Current	-	-	100	µA	V_R = 2 V
890 nm LED						
V_F	Forward Voltage	-	-	1.8	V	I_F = 40 mA
I_R	Reverse Current	-	-	100	µA	V_R = 2 V
935 nm LED						
V_F	Forward Voltage	-	-	1.7	V	I_F = 40 mA
I_R	Reverse Current	-	-	100	µA	V_R = 2 V

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Electrical Specifications

Electrical Characteristics (T_A = 25° C unless otherwise noted)						
SYMBOL	**PARAMETER**	**MIN**	**TYP**	**MAX**	**UNITS**	**TEST CONDITIONS**
Output Phototransistor						
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	30	-	-	V	I_C = 100 µA
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5	-	-	V	I_E = 100 µA
I_{CEO}	Collector Dark Current	-	-	100	nA	V_{CE} = 10 V, I_F = 0, E_E = 0
Output Photodarlington						
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	15	-	-	V	I_C = 100 µA
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5	-	-	V	I_E = 100 µA
I_{CEO}	Collector-Emitter Dark Current OPB745, OPB745WZ	-	-	25	µA	V_{CE} = 5 V, I_F = 0, E_E = 0
Coupled						
$V_{CE(SAT)}$	Saturation Voltage OPB708 OPB745, OPB745WZ	 - -	 - -	 0.40 1.10	V	 I_F = 40 mA, I_c = 3 µA, d = 0.15”[1][2] I_F = 40 mA, I_c = 3 µA, d = 0.15”[1][2] I_F = 40 mA, I_c = 400 µA, d = 0.15”[1][2]
$I_{C(ON)}$[1][2]	On-State Collector Current OPB708 OPB740, OPB740WZ OPB741WZ OPB742, OPB742WZ OPB743, OPB743WZ OPB744, OPB744WZ OPB745, OPB745WZ OPB748WZ	 0.01 0.05 0.05 0.01 0.20 0.20 5.00 0.01	 - - - - - - - -	 3.00 2.50 2.50 0.70 2.00 2.00 26.0 0.70	mA	V_{CE} = 5 V, I_F = 40 mA, d = 0.15” (3.810 mm)
I_{CX}[3]	Crosstalk OPB708 OPB740, OPB740WZ OPB741WZ OPB742, OPB742WZ OPB743, OPB743WZ OPB744, OPB744WZ OPB745, OPB745WZ OPB748WZ	 - - - - - - - -	 - - - - - - - -	 - 10.0 10.0 1.0 20.0 20.0 25.0 1.0	µA	V_{CC} = 5 V, I_F = 40 mA

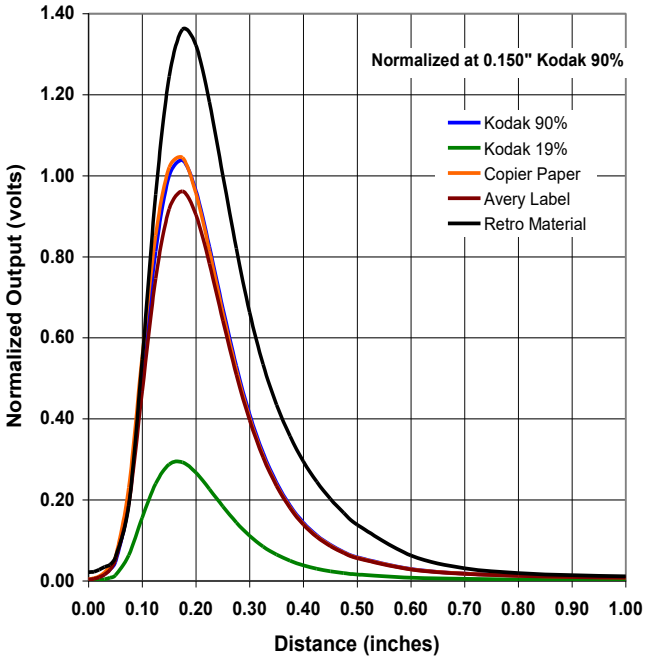
Notes:
1. The distance from the assembly face to the reflective surface is “d”.
2. Reflective surface is Eastman Kodak (Catalog #190 3061) neutral white test card with 90% diffuse reflectance as a reflecting surface.
3. Crosstalk is the photocurrent measured with current to the input diode, no reflective surface and no ambient light (E_E = 0).

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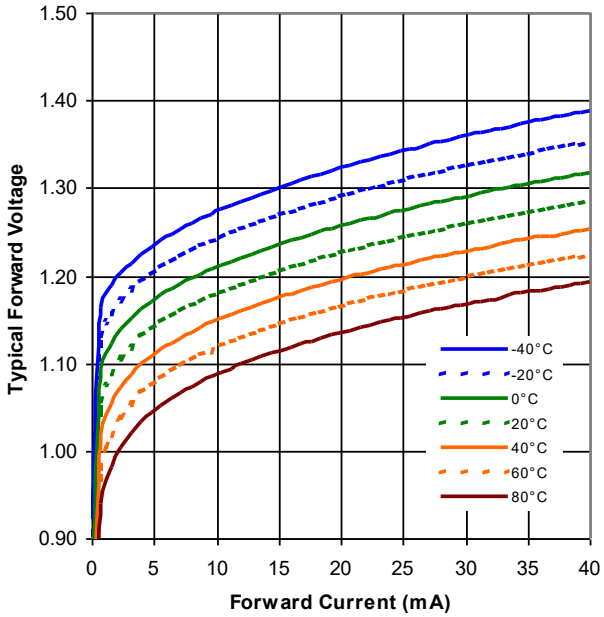
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Performance

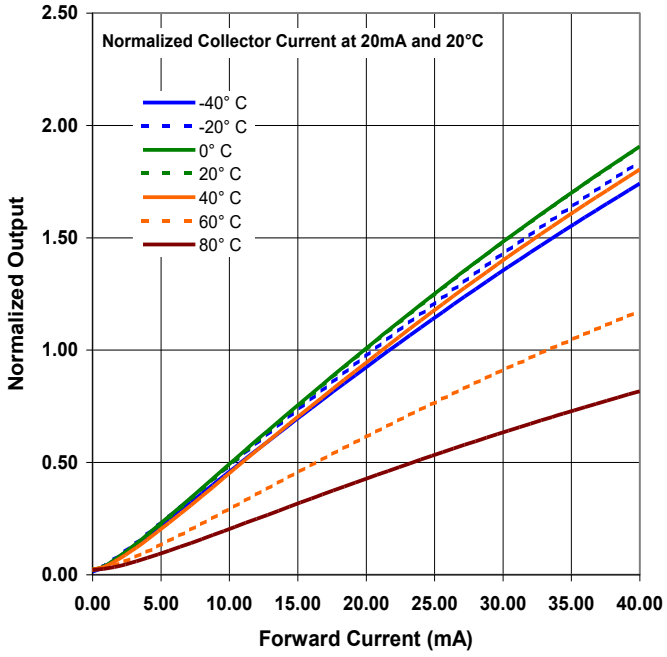
Transistor Output vs Distance



LED Forward Voltage vs Forward Current vs Temperature



Transistor Output vs Forward Current vs Temperature



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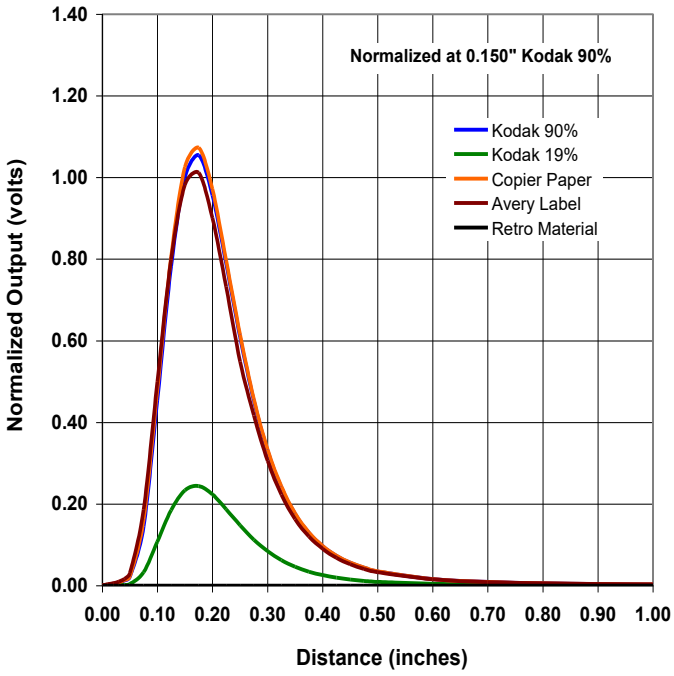
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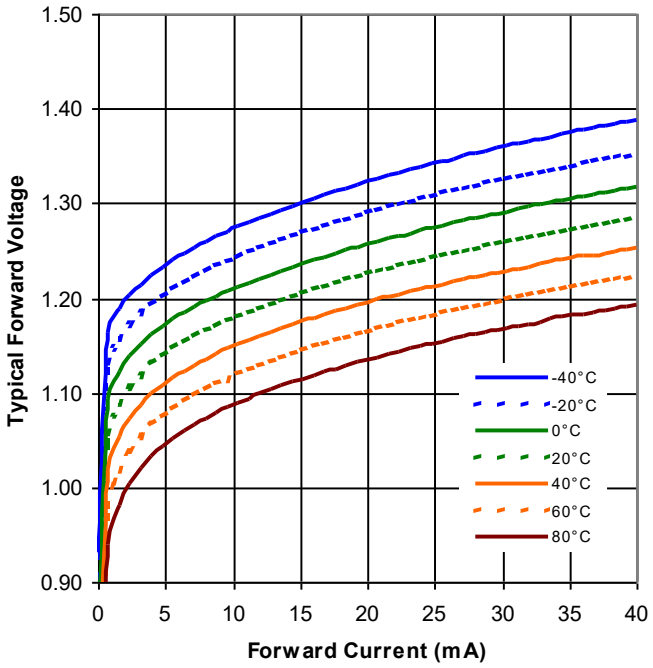
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Performance

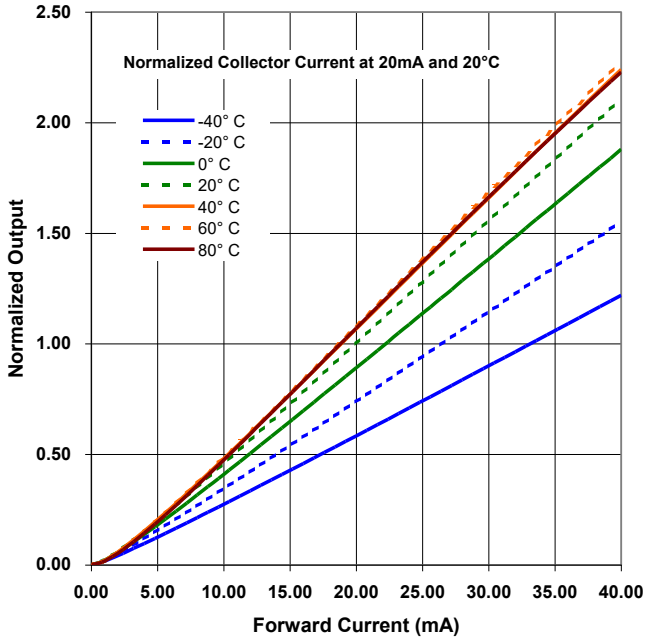
Darlington Output vs Distance



LED Forward Voltage vs Forward Current vs Temperature



Darlington Output vs Forward Current vs Temperature



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