

# Reflective Object Sensor OPB708, OPB709

OPB740 Series, OPB740WZ Series, OPB740W24Z Series  
OPB745, OPB745WZ, OPB745W24Z



## Features:

- Focused for maximum sensitivity
- Phototransistor or photodarlington output
- Crosstalk does not exceed specified ICEO
- 4" (101.600 mm) or 24" (609.600 mm) wire length
- 26 AWG wire size



## Description:

Each reflective object sensor in the **OPB708, OPB709, OPB740, OPB740WZ** and **OPB740W24Z** series consists of an infrared emitting diode and a NPN silicon phototransistor or a photodarlington (versions **OPB709, OPB745** and **OPB745WZ** only), which are mounted side-by-side on converging optical axes in a black plastic housing.

**OPB740-OPB744, OPB740WZ-OPB744WZ, and OPB740W24Z-OPB744W24Z** are a wired series of sensors that offer various options, including no windows, blue polysulfone windows for dust protection or opaque windows with offset openings for improved 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.

## Applications:

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

Part Number	LED Peak Wavelength	Sensor	Reflection Distance Inch (mm)	Lead Length/Wire Type
OPB708	935 nm			
OPB709				
OPB740	890 nm	Transistor	0.150"	0.150"
OPB741				
OPB742				
OPB743				
OPB744				
OPB745				
OPB740WZ		Transistor	0.150" (3.81mm)	4" / 26 AWG Wire
OPB741WZ				
OPB742WZ				
OPB743WZ				
OPB744WZ				
OPB740W24Z				
OPB741W24Z				
OPB742W24Z				
OPB743W24Z	Darlington		24" / 26 AWG Wire	
OPB744W24Z				
OPB745WZ				
OPB745W24Z			4" / 26 AWG	
			24" / 26AWG	

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**CONTAINS POLYSULFONE**  
To avoid stress cracking, we suggest using ND Industries' **Vibra-Tite** for thread-locking. **Vibra-Tite** evaporates fast without causing structural failure in OPTEK's molded plastics.  
Applies to: **OPB460, OPB470, OPB480, OPB490.**



RoHS

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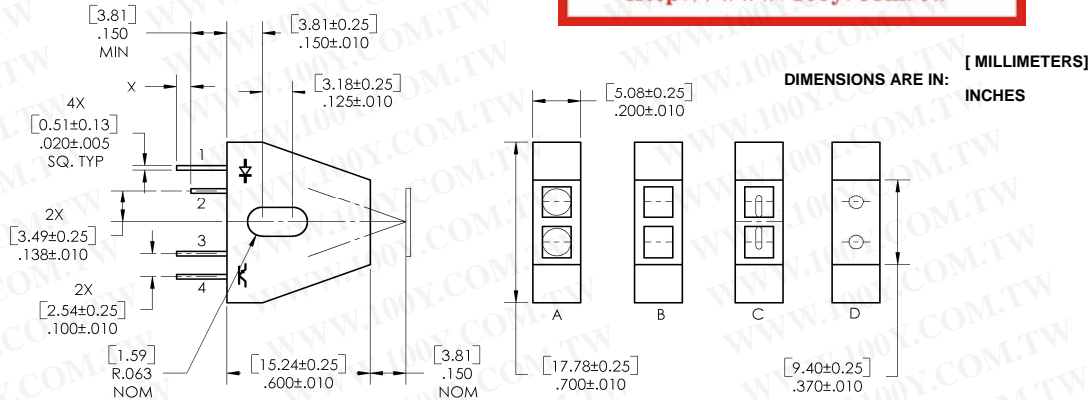
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OPB740 Series, OPB740WZ Series, OPB740W24Z Series  
OPB745, OPB745WZ, OPB745W24Z

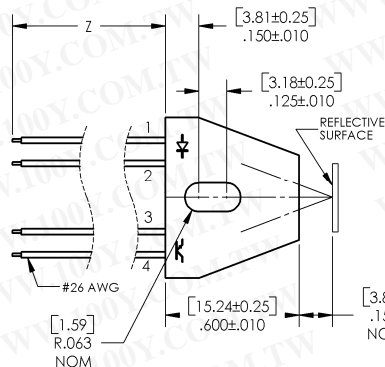


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**OPB708, OPB709, OPB740, OPB741,  
OPB742, OPB743, OPB744, OPB745**

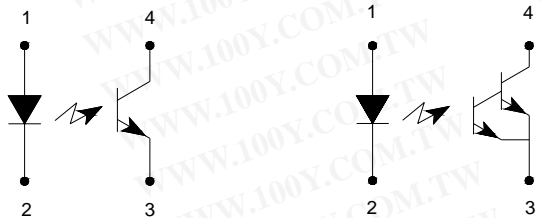


**OPB740WZ, OPB741WZ, OPB742WZ, OPB743WZ,  
OPB744WZ, OPB745WZ, OPB740W24Z, OPB741W24Z,  
OPB742W24Z, OPB743W24Z, OPB744W24Z,  
OPB745WZ,**



**OPB708**  
**OPB740 – OPB744**  
**OPB740WZ – OPB744WZ**  
**OPB740W24Z – OPB744W24Z**

**OPB709, OPB745,**  
**OPB745WZ – OPB745W24Z**



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

Package Style	
Part Number	Lens Configuration
OPB708	D - No windows
OPB709	D - No windows
OPB740	A - No windows
OPB740WZ	A - No windows
OPB740W24Z	A - No windows
OPB741	B - Blue windows
OPB741WZ	B - Blue windows
OPB741W24Z	B - Blue windows
OPB742	C - Offset windows
OPB742WZ	C - Offset windows
OPB742W24Z	C - Offset windows
OPB743	A - No windows
OPB743WZ	A - No windows
OPB743W24Z	A - No windows
OPB744	B - Blue windows
OPB744WZ	B - Blue windows
OPB744W24Z	B - Blue windows
OPB745	C - Offset windows
OPB745WZ	C - Offset windows
OPB745W24Z	C - Offset windows

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# Reflective Object Sensor

OPB708, OPB709

OPB740 Series, OPB740WZ Series, OPB740W24Z Series

OPB745, OPB745WZ, OPB745W24Z



## Absolute Maximum Ratings (T<sub>A</sub>=25°C unless otherwise noted)

Storage Temperature Range OPB708 OPB709 OPB740, OPB741, OPB742, OPB743, OPB744 OPB741WZ, OPB742WZ, OPB743WZ, OPB744WZ OPB745 OPB745WZ	-40° C to +85° C -40° C to +85° C -40° C to +85° C -40° C to +80° C -40° C to +85° C -40° C to +80° C
Operating Temperature Range OPB708 OPB709 OPB740, OPB741, OPB742, OPB743, OPB744 OPB741WZ, OPB742WZ, OPB743WZ, OPB744WZ OPB745 OPB745WZ	-40° C to +85° C -40° C to +85° C -40° C to +85° C -40° C to +80° C -40° C to +85° C -40° C to +80° C
Lead Soldering Temperature [1/16 inch (1.6mm) from the case for 5 sec. with soldering iron] <sup>(1)</sup>	260°C

**Input Diode** (see OP165 (935 nm) or OP265 (890 nm) for additional information)

Forward DC Current	40 mA
Reverse DC Voltage	2 V
Power Dissipation <sup>(2)</sup>	100 mW

**Sensor Output** (See OP505 (Phototransistor) or OP535 (Photodarlington) for additional information)

Collector-Emitter Voltage OPB708 OPB709 OPB740, OPB741, OPB742, OPB743, OPB744 OPB740WZ, OPB741WZ, OPB742WZ, OPB743WZ, OPB744WZ OPB745 OPB745WZ	30 V 15 V 30 V 30 V 15 V 15 V
Emitter-Collector Voltage	5 V
Power Dissipation <sup>(2)</sup>	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.

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# Reflective Object Sensor OPB708, OPB709

OPB740 Series, OPB740WZ Series, OPB740W24Z Series  
OPB745, OPB745WZ, OPB745W24Z



## Electrical Characteristics (T<sub>A</sub> = 25°C unless otherwise noted)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
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### Input Diode (See OP265 for additional information — for reference only)

V <sub>F</sub>	Forward Voltage	-	-	1.7	V	I <sub>F</sub> = 40 mA
I <sub>R</sub>	Reverse Current	-	-	100	μA	V <sub>R</sub> = 2 V

### Output Phototransistor (See OP505 for additional information — for reference only)

V <sub>(BR)CEO</sub>	Collector-Emitter Breakdown Voltage	30	-	-	V	I <sub>C</sub> = 100 μA
V <sub>(BR)ECO</sub>	Emitter-Collector Breakdown Voltage	5	-	-	V	I <sub>E</sub> = 100 μA
I <sub>CEO</sub>	Collector Dark Current	-	-	100	nA	V <sub>CE</sub> = 10 V, I <sub>F</sub> = 0, E <sub>E</sub> = 0

### Output Photodarlington (See OP535 for additional information — for reference only)

V <sub>(BR)CEO</sub>	Collector-Emitter Breakdown Voltage OPB709	30	-	-	V	I <sub>C</sub> = 100 μA
	OPB745, OPB745WZ	15	-	-	V	
V <sub>(BR)ECO</sub>	Emitter-Collector Breakdown Voltage	5	-	-	V	I <sub>E</sub> = 100 μA
I <sub>CEO</sub>	Collector-Emitter Dark Current OPB709	-	-	100	nA	V <sub>CE</sub> = 10 V, I <sub>F</sub> = 0, E <sub>E</sub> = 0
	OPB745, OPB745WZ	-	-	250	nA	

### Coupled

V <sub>CE(SAT)</sub>	Saturation Voltage OPB708, OPB709 (only) <sup>(1) (2)</sup>	-	-	.40	V	I <sub>F</sub> = 40 mA, I <sub>C</sub> = 3 μA, d = 0.15"
I <sub>C(ON)</sub> <sup>(1)(2)</sup>	On-State Collector Current OPB708	10	-	-	-	V <sub>CE</sub> = 5 V, I <sub>F</sub> = 40mA, d = 0.15" (3.810 mm)
	OPB709	1000	-	-	-	
	OPB740, OPB741	50	-	-	-	
	OPB742	10	-	-	-	
	OPB743, OPB744	200	-	-	μA	
	OPB740WZ, OPB741WZ	50	-	-	-	
	OPB742WZ	10	-	-	-	
I <sub>CX</sub> <sup>(3)</sup>	OPB743WZ, OPB744WZ	200	-	-	-	V <sub>CC</sub> = 5 V, I <sub>F</sub> = 40mA
	OPB745, OPB745WZ	1000	-	-	-	
	Crosstalk OPB708	-	-	-	-	
	OPB709	-	-	-	-	
	OPB740, OPB741	-	-	10	μA	
	OPB742	-	-	100	μA	
	OPB743, OPB744	-	-	20	μA	
OPB740WZ, OPB741WZ	-	-	10	μA		
OPB742WZ	-	-	100	μA		
OPB743W, OPB744WZ	-	-	20	μA		
OPB745, OPB745WZ	-	-	250	nA		

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#### Notes:

- The distance from the assembly face to the reflective surface is "d".
- Reflective surface is Eastman Kodak neutral white test card with 90% diffuse reflectance as a reflecting surface. Reference: Eastman Kodak, Catalog #E152 7795.
- Crosstalk is the photocurrent measured with current to the input diode, no reflective surface and no ambient light (E<sub>E</sub> = 0).

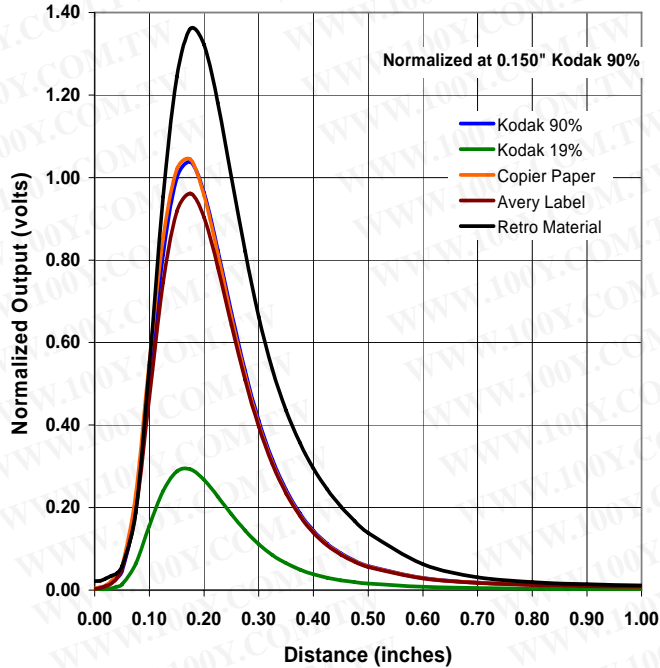
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**OPB708, OPB709**

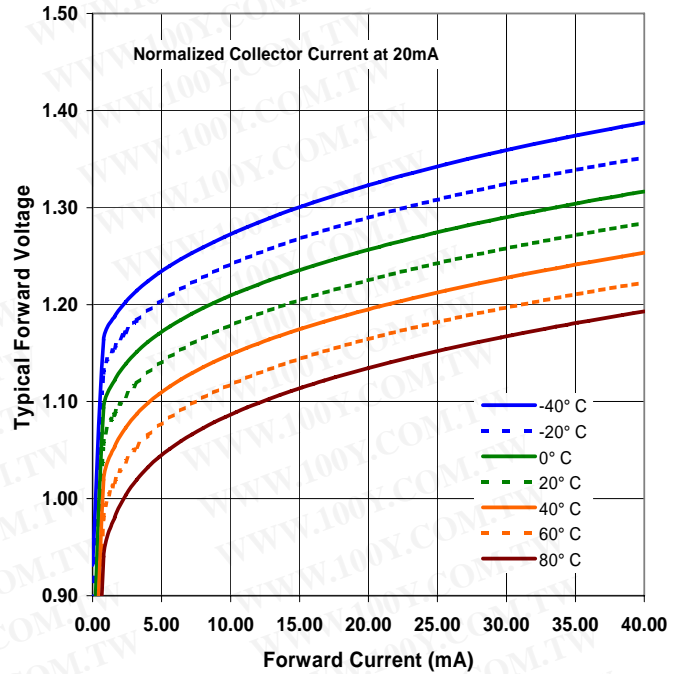
**OPB740 Series, OPB740WZ Series, OPB740W24Z Series**  
**OPB745, OPB745WZ, OPB745W24Z**



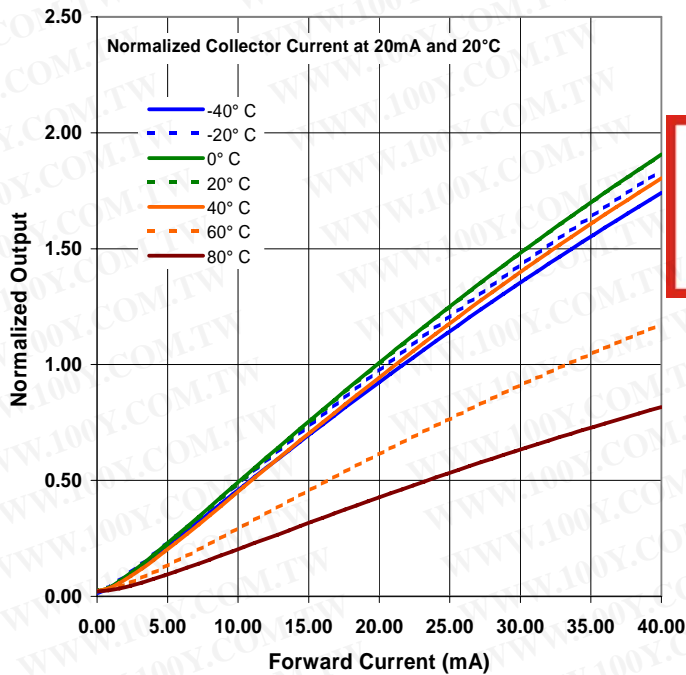
**Transistor Output vs Distance**



**Transistor Forward Voltage vs Forward Current vs Temperature**



**Transistor Output vs Forward Current vs Temperature**



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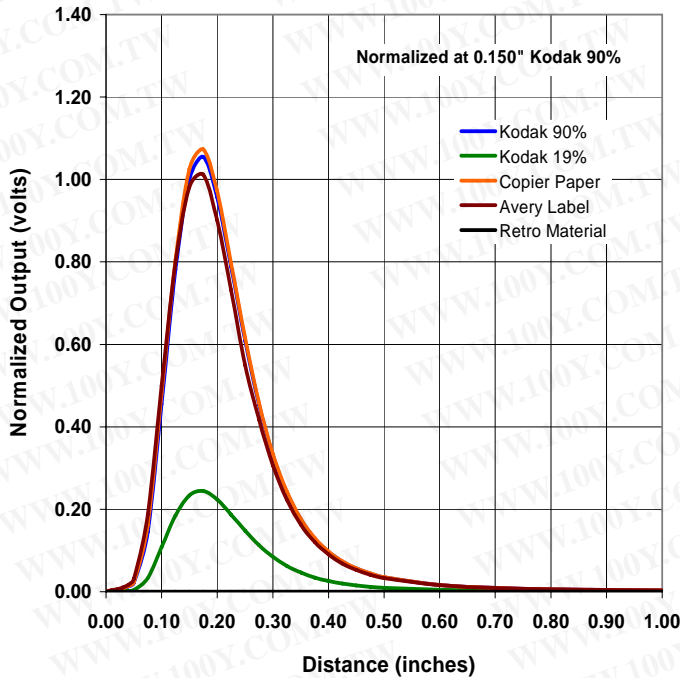
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**OPB708, OPB709**

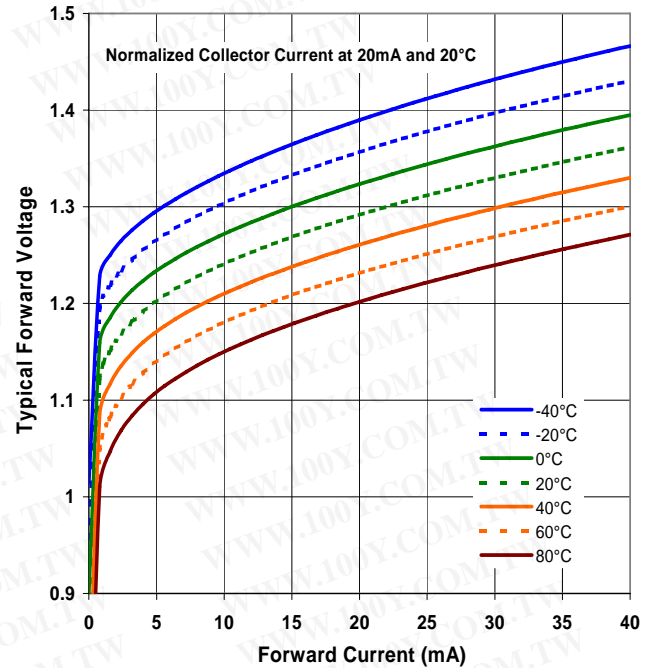
**OPB740 Series, OPB740WZ Series, OPB740W24Z Series**  
**OPB745, OPB745WZ, OPB745W24Z**



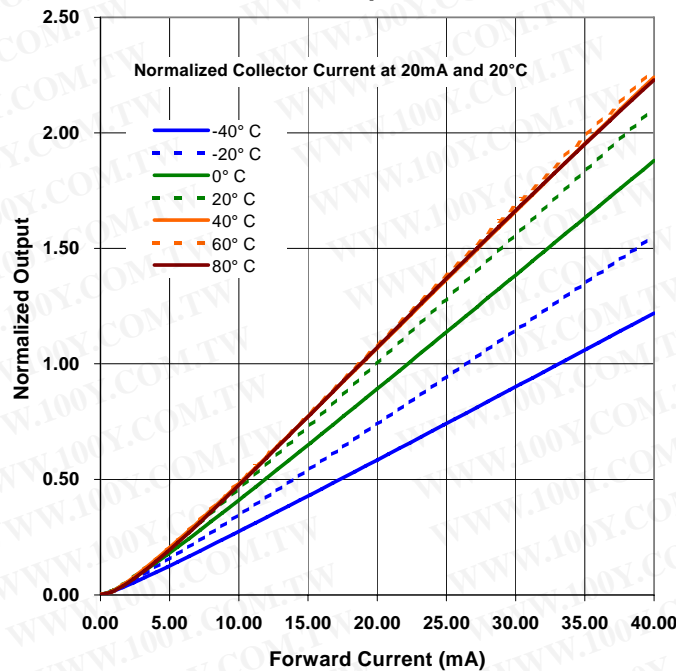
**Darlington Output vs Distance**



**Darlington Forward Voltage vs Forward Current vs Temperature**



**Darlington Output vs Forward Current vs Temperature**



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