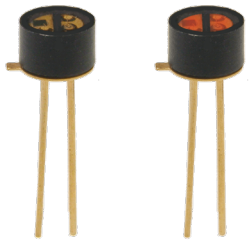
Reflective Object Sensor

OPB710, OPB710F, OPB730, OPB730F

F-Package



Features:

- Choice of phototransistor or photodarlington output
- Unfocused for sensing diffuse surface
- Mounted on standard TO-72 header
- Available in clear encapsulating epoxy (OPB710, OPB730)
- Filtered to reduce the effect of visible or fluorescent light (OPB710F, OPB730F)

Description:

OPB710 and **OPB710F** consist of a gallium arsenide infrared emitting diode and an NPN silicon phototransistor. **OPB730** and **OPB730F** consist of a gallium arsenide infrared emitting diode and an NPN silicon photodarlington.

On each sensor, the emitting diode and detector are mounted side-by-side on parallel axes in a standard TO-72 header. A black plastic sleeve is attached and filled with encapsulating epoxy to cover the emitter and detector.

The **OPB710F** and **OPB730F** ("F" versions) have 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.

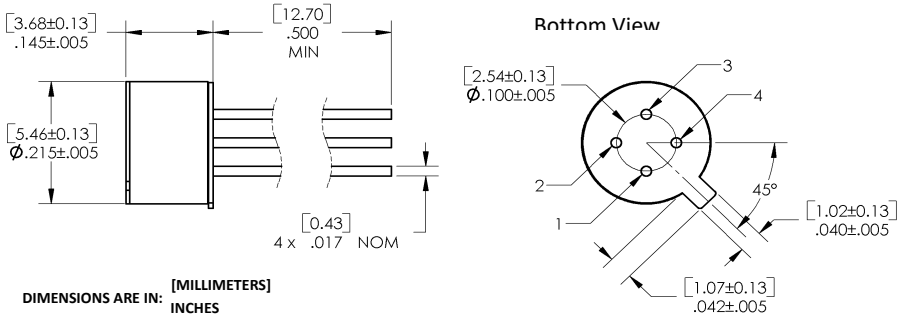
Custom electrical, wire, cabling and connectors are available. Contact your local representative or OPTEK for more information.

For application information, refer to Application Bulletins 248 and 213

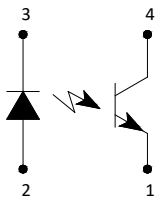
Part Number	LED Peak Wavelength	Sensor	Reflection Distance Inch (mm)
OPB710	935 nm	Transistor	0.250" (6.35 mm)
OPB710F			
OPB730		Darlington	
OPB730F			

Applications:

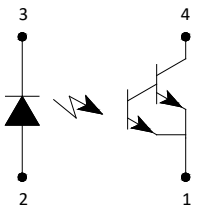
- Non-contact reflective object sensor
- Assembly line automation
- Machine automation
- Machine safety
- End of travel sensor
- Door sensor



OPB710



OPB730



Pin #	LED	Pin #	Transistor
3	Cathode	4	Collector
2	Anode	1	Emitter

RoHS

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Electrical Specifications

Absolute Maximum Ratings (T_A = 25° C unless otherwise noted)

Storage Temperature Range	-20° C to +85° C
Operating Temperature Range	0° C to +70° 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	50 mA
Peak Forward Current (1 µs pulse width, 300 pps)	3 A
Reverse DC Voltage	3 V
Power Dissipation (2)	75 mW
Output Photosensor	
Collector-Emitter Voltage OPB710, OPB710F OPB730, OPB730F	 30 V 15 V
Emitter-Collector Voltage	5 V
Collector DC Current	25 mA
Power Dissipation (3)	150 mW

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

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode						
V_F	Forward Voltage	1.0	-	1.5	V	I_F = 50 mA
I_R	Reverse Current	-	-	100	µA	V_R = 3 V
Output Phototransistor						
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	30	-	-	V	I_C = 1 mA
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5	-	-	V	I_E = 100 µA
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	-	-	0.4	V	I_C = 50 µA, Ee = 0.75 mW/cm^2
I_{CEO}	Collector Dark Current OPB710, OPB710F	-	-	100	nA	V_{CE} = 5 V, I_F = 0, $E_E \leq$ 0.1 µW/cm^2
Combined						
I_{CX} (5)	Crosstalk OPB710, OPB710F	-	-	100	nA	I_F = 50 mA, V_{CE} = 5 V (no reflecting surface)
$I_{C(ON)}$ (4)	On-State Collector Current OPB710, OPB710F	150	-	-	µA	I_F = 50 mA, V_{CE} = 5 V, d = 0.250” (6.35 mm)

Notes:
(1) RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering.
(2) Derate linearly 1.22 mW/° C above 25° C.
(3) Derate linearly 2.89 mW/° C above 25° C.

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Electrical Specifications

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

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Output Photodarlington						
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	15	-	-	V	I_C = 1 mA
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5	-	-	V	I_E = 100 µA
I_{CEO}	Collector Dark Current OPB730, OPB730F	-	-	250	nA	V_{CE} = 5 V, I_F = 0, $E_E \leq 0.1$ µW/cm^2
$V_{CE(SAT)}$	Collector– Emitter Saturation Voltage	-	-	1.10	V	
Combined						
I_{CX} (5)	Crosstalk OPB730, OPB730F	-	-	500	nA	I_F = 50 mA, V_{CE} = 5 V (no reflecting surface)
$I_{C(ON)}$ (4)	On-State Collector Current OPB730, OPB730F	1	-	-	mA	I_F = 50 mA, V_{CE} = 5 V, d = 0.250” (6.35 mm)

Notes:
(1) RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering.
(2) Derate linearly 1.22 mW/° C above 25° C.
(3) Derate linearly 2.89 mW/° C above 25° C.
(4) Measured using Eastman Kodak neutral white test card having 90% diffuse reflectance located .250 inch (6.35 mm) from the face of the OPB710/OPB730. Reference: Eastman Kodak, Catalog #E 152 7795.
(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.

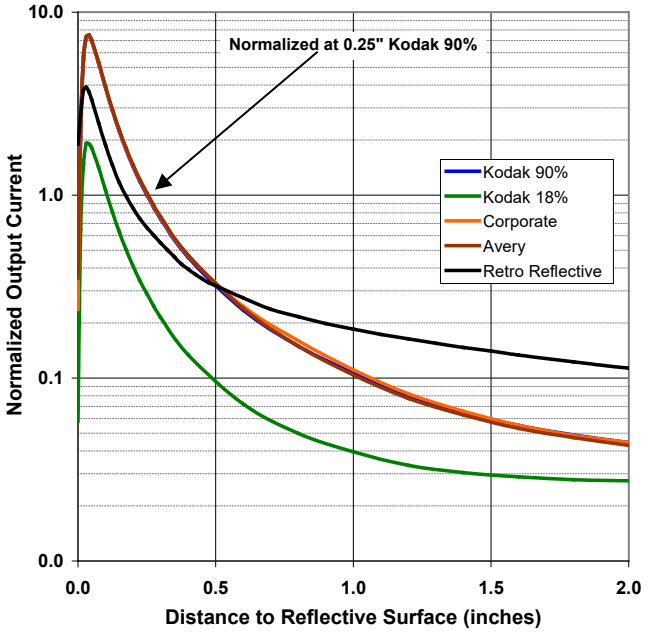
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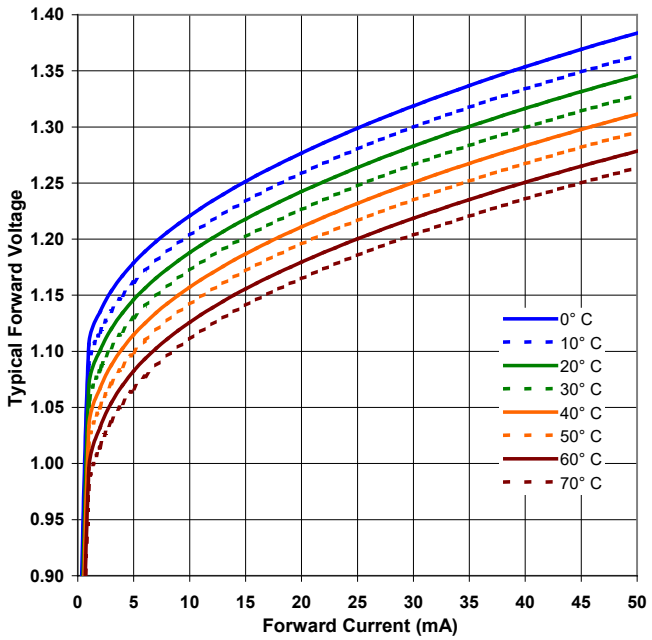
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Typical Performance

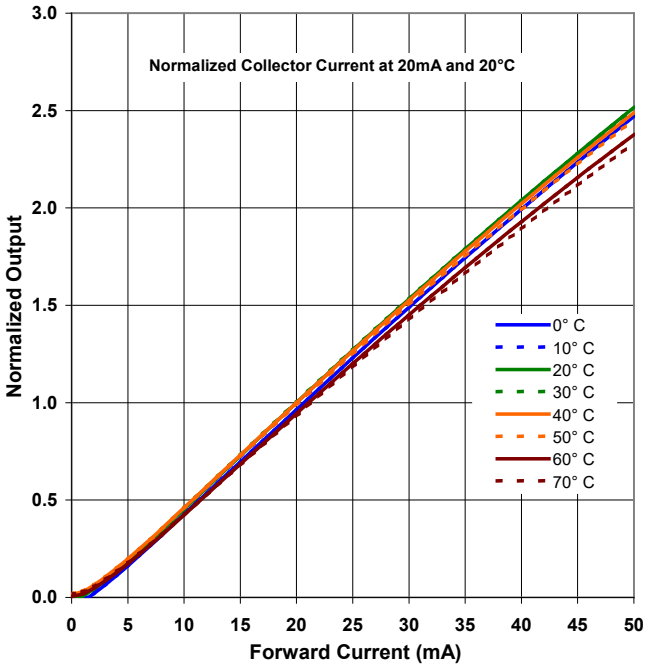
OPB710 - Normalized Collector Current vs. Object Distance



OPB710 - Forward Voltage vs Forward Current vs Temp



OPB710 - Output vs Forward Current vs Temp

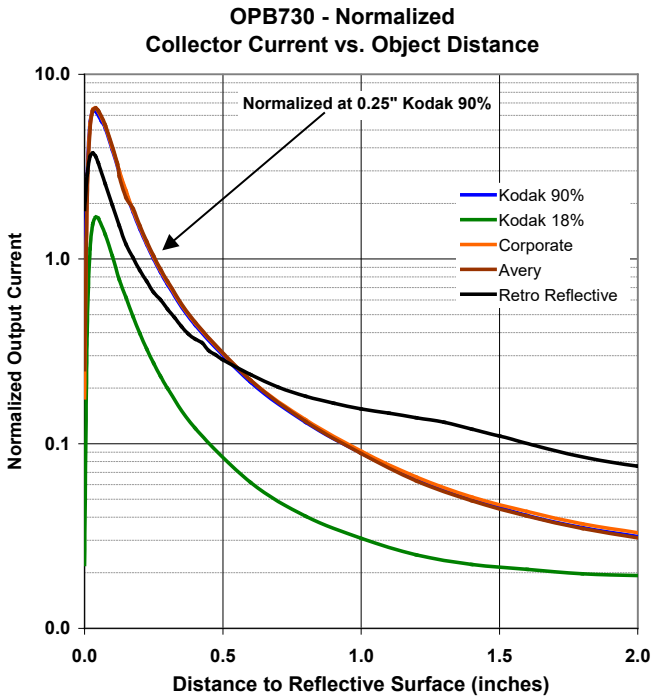


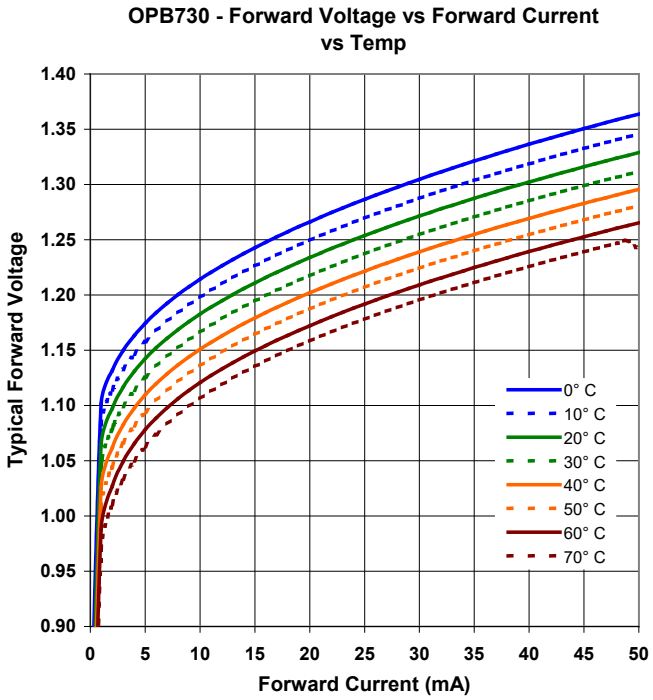
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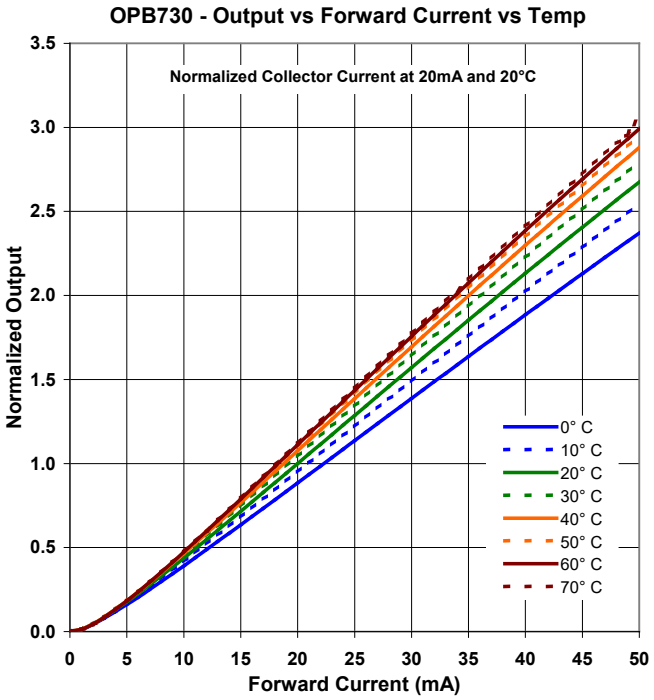
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Typical Performance







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