

Reflective Object Sensor

OPB711, OPB712



Features:

- Choice of phototransistor or photodarlington output
- Unfocused for sensing diffuse surface
- Low-cost plastic housing
- Choice of filter or unfiltered



Description:

OPB711 consists of an infrared emitting diode and an NPN silicon phototransistor, mounted "side-by-side" on parallel axes in a black opaque plastic housing. The **OPB712** consists of an infrared emitting diode and an NPN silicon photodarlington, mounted "side-by-side" on parallel axes in a black plastic housing.

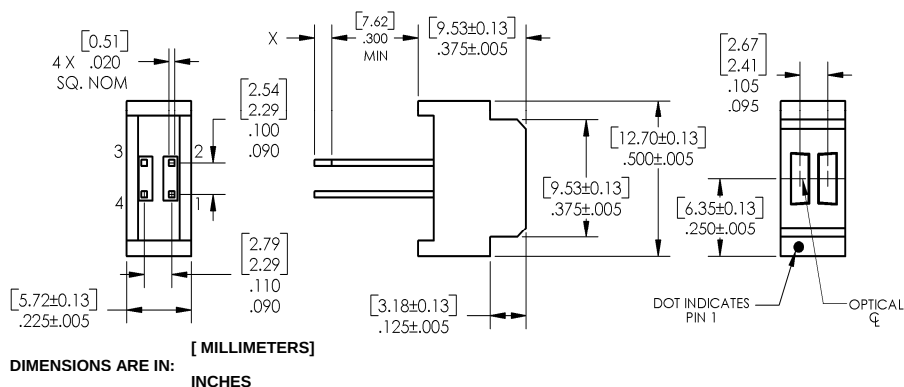
OPB711's, emitting diode and phototransistor are encapsulated in a filtering epoxy to reduce ambient light noise. Its phototransistor responds to radiation from the emitter only when a reflective object passes within its field of view.

OPB712's emitting diode and photodarlington are encapsulated in a filtering epoxy to reduce ambient light noise. Its photodarlington responds to radiation from the emitter only when a reflective object passes within its field of view.

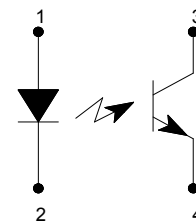
Applications:

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

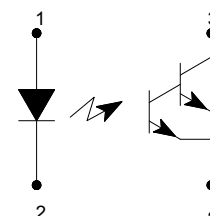
Part Number	LED Peak Wavelength	Sensor	Reflection Distance Inch (mm)	Lead Length / Spacing
OPB711	890 nm	Transistor	0.080" (2.03mm)	0.30" / 0.095" & 0.100" "X" = 0.06" (1.5 mm)
OPB712		Darlington		



OPB711



OPB712



RoHS

OPTEK reserves the right to make changes at any time in order to improve design and to supply the best product possible.

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Absolute Maximum Ratings ($T_A=25^\circ\text{C}$ unless otherwise noted)

Storage & Operating Temperature Range	-40°C to $+85^\circ\text{C}$
Lead Soldering Temperature [1/16 inch (1.6mm) from the case for 5 sec. with soldering iron] ⁽¹⁾	260°C

Input Diode (See OP268 for additional information—for reference only)

Forward DC Current	50 mA
Peak Forward Current (1 μs pulse width, 300 pps)	3 A
Reverse DC Voltage	2 V
Power Dissipation ⁽²⁾	80 mW

Output Phototransistor (OPB711), Output Photodarlington (OPB712)

Collector-Emitter Voltage OPB711 OPB712	24 V 15 V
Emitter-Collector Voltage	5 V
Collector DC Current OPB711 OPB712	25 mA 125 mA
Power Dissipation OPB711 ⁽²⁾ OPB712 ⁽³⁾	80 mW 125 mW

Notes:

- (1) RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering.
- (2) Derate linearly $1.33\text{ mW}/\text{cm}^2$ above 25°C .
- (3) Derate linearly $2.08\text{ mW}/^\circ\text{C}$ above 25°C .

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

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
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Input Diode (see OP168F for additional information)

V _F	Forward Voltage	-	-	1.7	V	I _F = 20 mA
I _R	Reverse Current	-	-	100	μA	V _R = 2 V

Output Phototransistor (OPB711—See OP508F for additional information)

Output Photodarlington (OPB712—See OP538F for additional information)

V _{(BR)CEO}	Collector-Emitter Breakdown Voltage OPB711 OPB712	24 15	- -	- -	V	I _C = 100 μA
V _{(BR)ECO}	Emitter-Collector Breakdown Voltage	5	-	-	V	I _E = 100 μA
I _{CEO}	Collector Dark Current OPB711 OPB712	- -	- -	100 250	nA	V _{CE} = 10 V, I _F = 0, E _E = ≤ 0.1 μW/cm ²

Combined

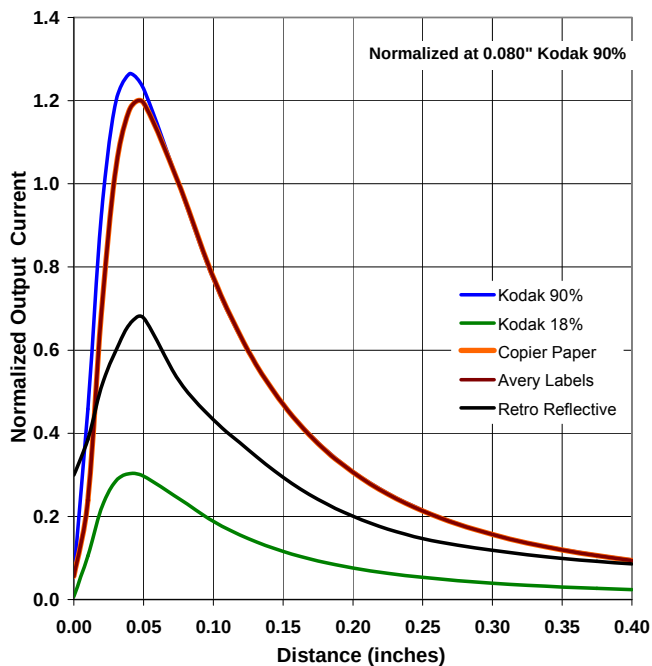
V _{CE(SAT)}	Collector-Emitter Saturation Voltage ⁽¹⁾⁽²⁾ OPB711 OPB712	- -	- -	.4 1.1	V	I _F = 20 mA, I _C = 50 μA, d = 0.080" (2.03 mm)
I _{C(ON)}	On-State Collector Current ⁽¹⁾⁽²⁾ OPB711 OPB712	.35 20	- -	10.0 50	mA mA	I _F = 20 mA, V _{CE} = 5 V, d = 0.080" (2.03 mm)
I _{CX}	Crosstalk OPB711 ⁽³⁾ OPB712 ⁽⁴⁾	- -	- -	100 25	nA μA	V _{CE} = 5 V, I _F = 20 mA (no reflecting surface)

Notes:

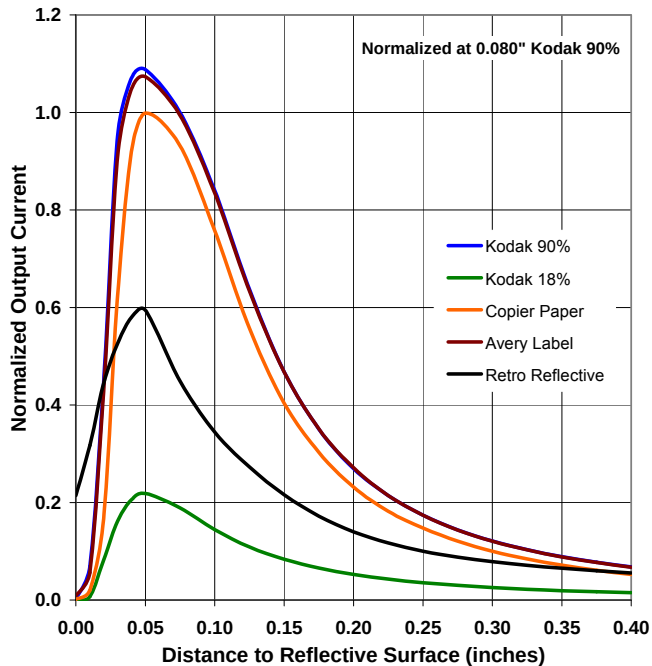
- (1) On OPB711, D is the distance from the assembly measurement surface to the reflective surface. On OPB712, D is the distance from the assembly face to the reflective surface.
- (2) Measured using Eastman Kodak neutral white test card with 90% diffuse reflectance as a reflecting surface. Reference: Eastman Kodak, Catalog #E 152 7795.
- (3) Crosstalk (I_{CX}) is the collector current measured with the indicated current in the input diode and with no reflective surface.
- (4) All parameters were tested using pulse techniques.

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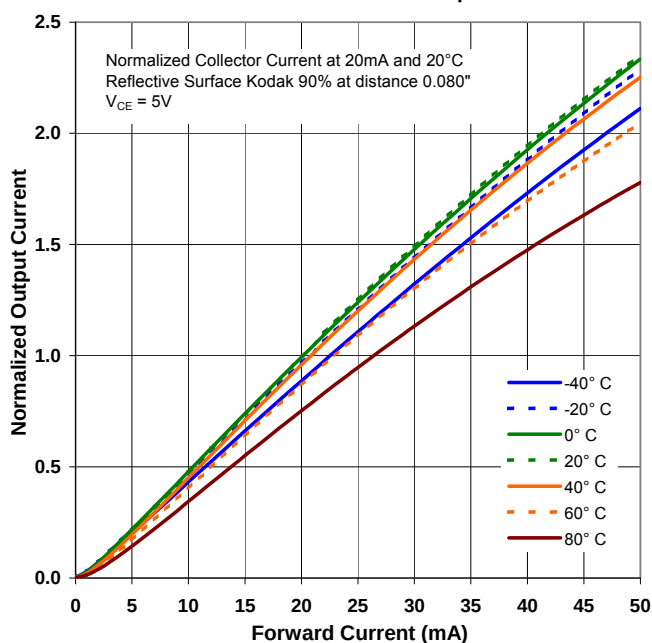
OPB711 - Output vs Distance



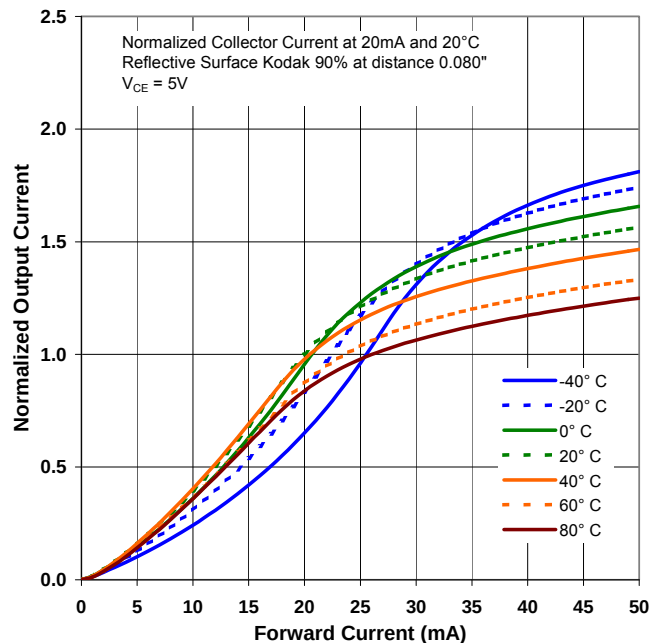
OPB712 - Output vs Distance



OPB711 - Normalized Collector Current vs Forward Current vs Temperature



OPB712 - Normalized Collector Current vs Forward Current vs Temperature



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