Slotted Optical Flag Switch

OPB680, OPB680-20, OPB690Z



Features:

- Phototransistor output
- Mechanical switch replacement
- Enhanced signal to noise ratio
- Designed for printed circuit board mounting (OPB680, OPB680-20)
- Lever force options (OPB680, OPB680-20)
- 3-pin connector, 0.98” (2.5 mm) Mates with Molex 22-01-1032 and terminal #08-70-0069

Description:

Each **OPB680**, **OPB680-20** and **OPB690Z** optical flag switch consists of an infrared emitting diode in a molded plastic housing. The phototransistor has an enhanced low current roll-off that improves contrast ratio and immunity to background irradiance.

A lever arm actuated flag interrupts the light beam and switches the output between states that can readily drive logic gates. This can be actuated by passing a paper sheet without damaging the paper’s edge.

OPB680-20 offers increased lever operating force that prevents false triggering due to incidental contact in door sensing and other heavy-duty applications.

OPB690Z is designed to easily snap mount into a 0.037” ± 0.001” (0.940 mm ± 0.025 mm) thick material with a rectangular opening of 0.320” ± 0.003” x 0.472” (8.128 mm x 11.989 mm) minimum. Insertion into the punched side of metal is recommended.

Customized lever arms and spring torques can be designed for specific applications for each of the devices.

For application information, refer to Application Bulletins 248 and 213.

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

Applications:

- Mechanical switch replacement
- Speed indication (tachometer)
- Mechanical limit indication
- Edge sensing

Ordering Information

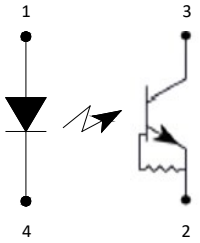
Part Number	LED Peak Wavelength	Sensor	Flag Travel Degrees Max	Lead Length / Spacing or Connector
OPB680	890 nm	Rbe Transistor	51°	0.100" / 0.275"
OPB680-20				
OPB690Z			70°	Molex 5102

RoHS

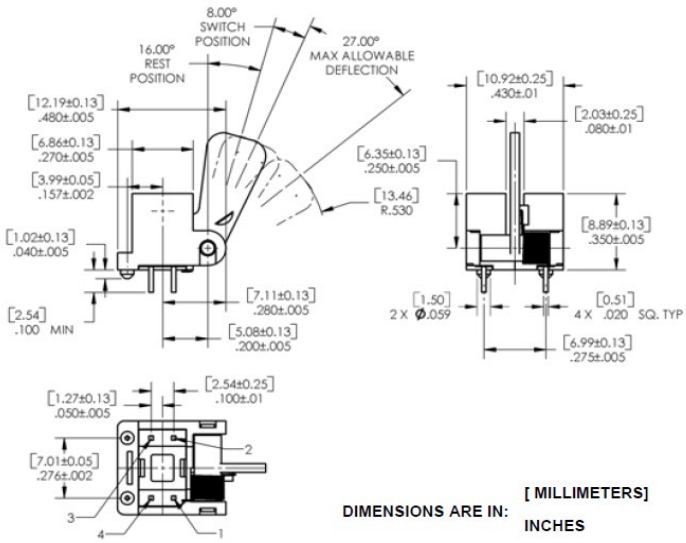
General Note
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OPB680, OPB680-20



Pin #	Description	Pin #	Description
1	Anode	3	Collector
4	Cathode	2	Emitter

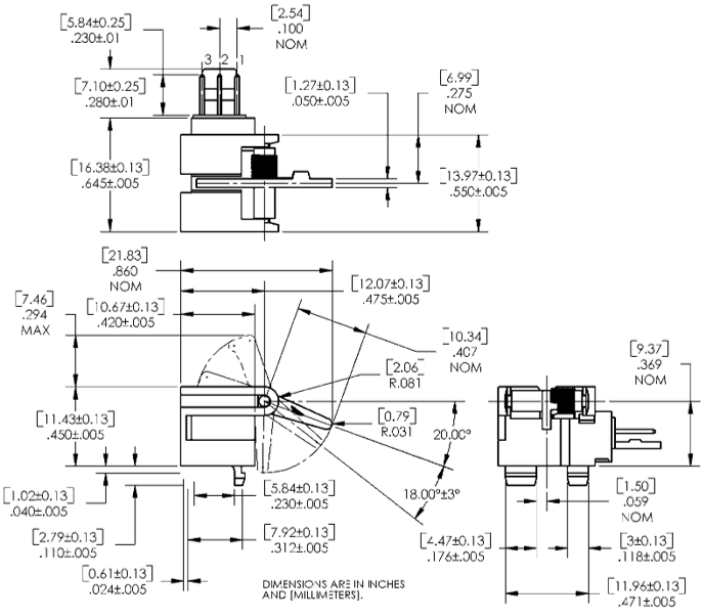


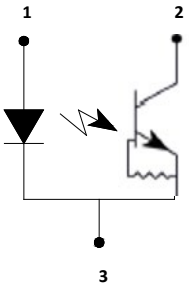
Notes:

(1) For OPB680 and OPB680-20, the “on” condition exists when the lever arm is in the rest position (16° from vertical).

(2) For OPB680 and OPB680-20, the “off” condition exists when the lever arm is deflected clockwise 8° ± 3° from the rest position (16° from vertical). Maximum allowable deflection is 35° from the rest position.

OPB690Z





Pin #	Description
1	Anode
2	Collector
3	Ground

Notes:

(1) For OPB690Z, the “on” condition exists when the lever arm is deflected clockwise 18° +/-3° from the rest position (20° from vertical).

(2) For OPB690Z, the “off” position exists when the lever arm is in the rest position (20° from vertical).

(3) For OPB690Z, from the rest position to the switch point the lever torque measured at the end of the arm is 1.5 grams maximum.

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Electrical Specifications

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

Storage & Operating Temperature Range	-40° C to +100° 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)	100 mW
Output Phototransistor	
Collector-Emitter Voltage	24 V
Emitter Reverse Current	10 mA
Collector DC Current	30 mA
Power Dissipation (3)	200 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	-	1.6	V	I_F = 10 mA
I_R	Reverse Current	-	-	100	µA	V_R = 3 V
Output Phototransistor						
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	24	-	-	V	I_C = 100 µA
BV_{ECO}	Emitter-Collector Breakdown Voltage	4.0	-	-	V	I_{EC} = 100 µA
I_{CEO}	Collector-Emitter Dark Current	-	-	100	µA	V_{CE} = 5 V
Coupled						
V_{SAT}	Saturation Voltage	-	-	0.4	V	I_F = 10 mA, I_C = 100 µA
$I_{C(ON)}$	On-State Collector Current	600	-	-	µA	I_F = 10 mA, V_{CE} = 5 V, unblocked
$I_{C(ON)}$	On-State Collector Current	-	-	150	nA	I_F = 10 mA, V_{CE} = 5 V, blocked
Mechanical						
F_{OP}	Operating Force OPB680, OPB690Z OPB680-20	 - -	 - -	 1.5 20	g	Measured at end of lever
Cycles	Operating Cycles	100 K	-	-	cycles	-

Notes:

(1) RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering. Maximum 20 grams force may be applied to leads when soldering (OPB680, OPB680-20).

(2) Derate linearly 1.07 mW/° C above 25° C.

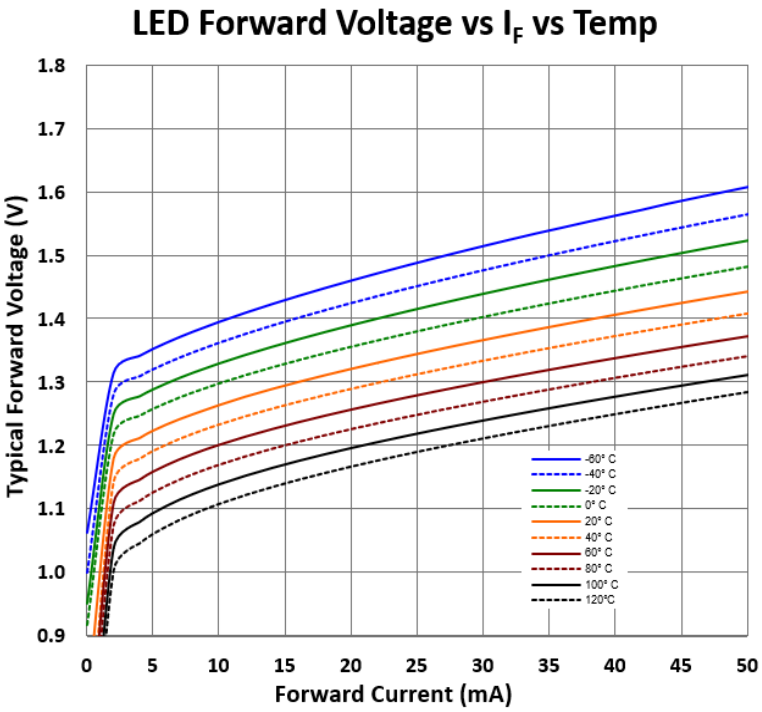
(3) Derate linearly 2.00 mW/° C above 25° C.

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Typical Performance

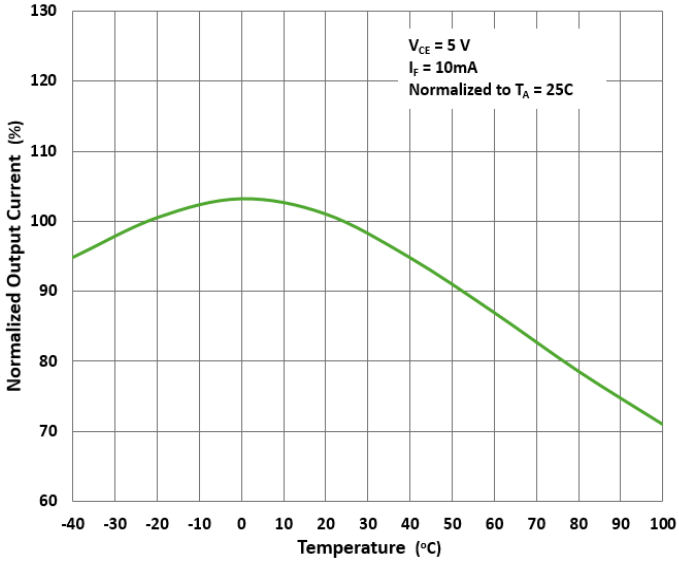


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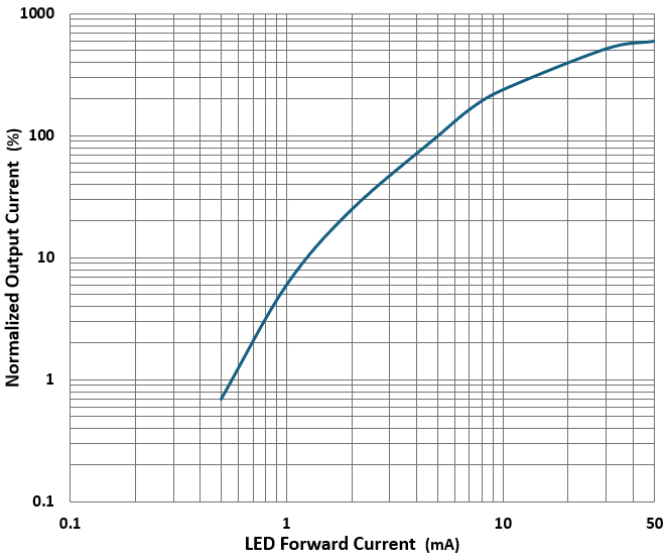
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Typical Performance

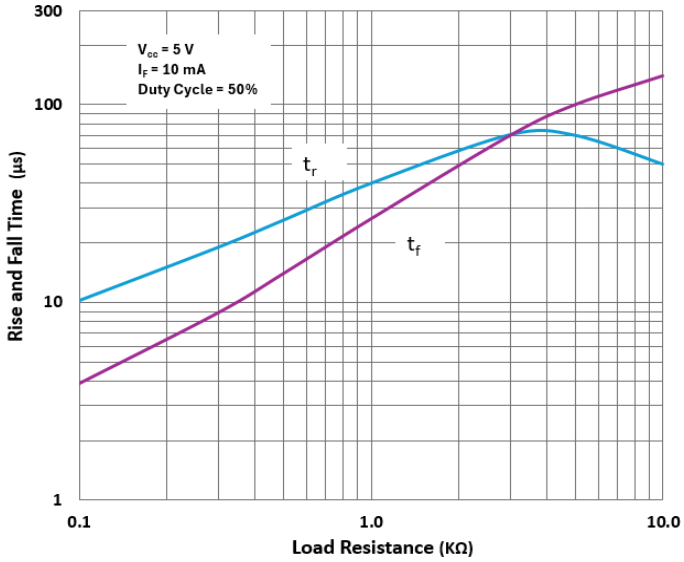
Output Current vs Temperature



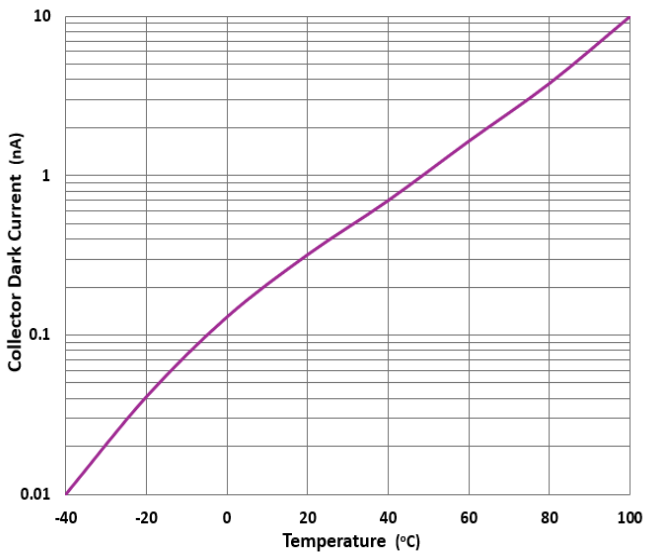
Output Current vs LED Current



Transistor Output - Rise and Fall Time



Collector Dark Current vs Temperature



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