



Product Bulletin OPB690
July 1996

Slotted Optical Flag Switch Type OPB690



Features

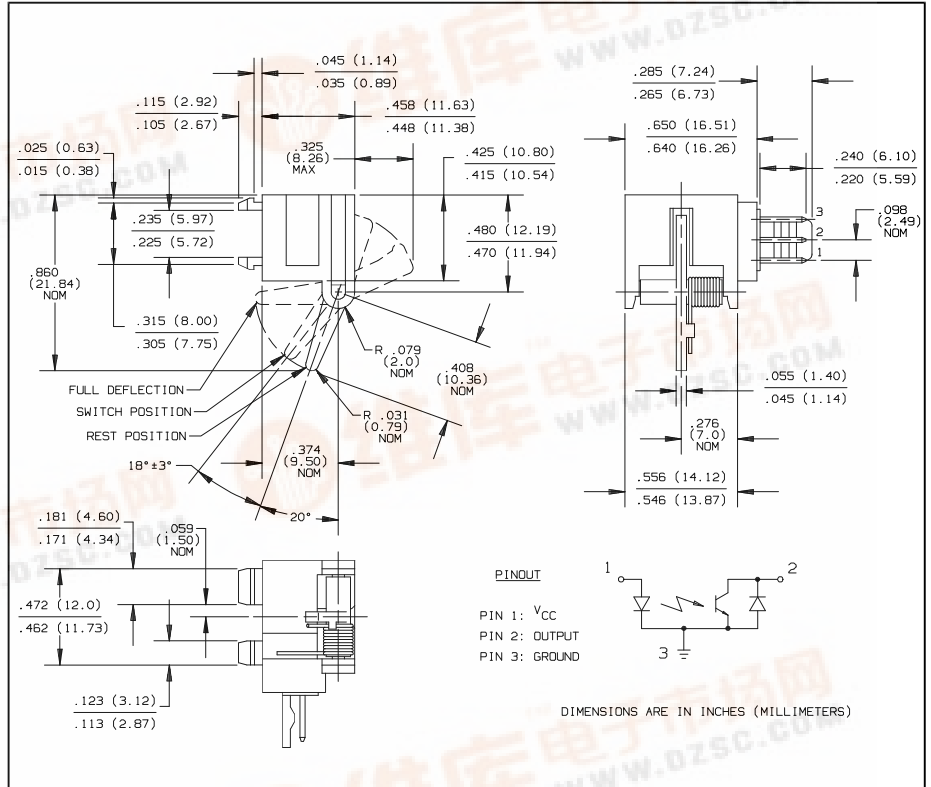
- Phototransistor output
- Mechanical switch replacement
- 3-pin connector (Ho Tien L2561-03), Molex compatible connector 5102 series housing and 5103 series terminal
- Enhanced signal to noise ratio

Description

The OPB690 consists of an NPN phototransistor and an infrared emitting diode in a molded plastic housing. The phototransistor has an enhanced low current roll-off which improves contrast ratio and immunity to background irradiance. A lever arm actuated flag interrupts the light beam, switching the transistor output between states that can readily drive logic gates.

This switch is designed to easily snap mount into a $0.037" \pm 0.001"$ (0.94 mm) thick material with a rectangular opening of $0.320" \pm 0.003" \times 0.472"$ (8.13 mm x 11.99 mm) minimum. Insertion into the punched side of metal is recommended.

Customized lever arms and spring torques can be designed for specific applications.



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

Storage and Operating Temperature	-40° C to +100° C
Input Diode	
Forward DC Current	50 mA
Peak Forward Current (1 μs pulse width, 300 pps)	3.0 A
Reverse DC Voltage	3.0 V
Power Dissipation	100 mW ⁽¹⁾
Output Phototransistor	
Collector-Emitter Voltage	30 V
Emitter Reverse Current	10 mA
Collector DC Current	30 mA
Power Dissipation	200 mW ⁽²⁾

Notes:

- (1) Derate linearly 1.33 mW/° C above 25° C.
- (2) Derate linearly 2.0 mW/° C above 25° C.
- (3) "Off" condition exists when the lever arm is in the rest position (20° from vertical) as shown in the figure.
- (4) "On" condition exists when the lever arm is deflected clockwise 18° +/- 3° from the rest position (20° from vertical) as shown in the figure.
- (5) From the rest position to the switch point, lever torque measured at the end of the arm is 1.5 grams max.



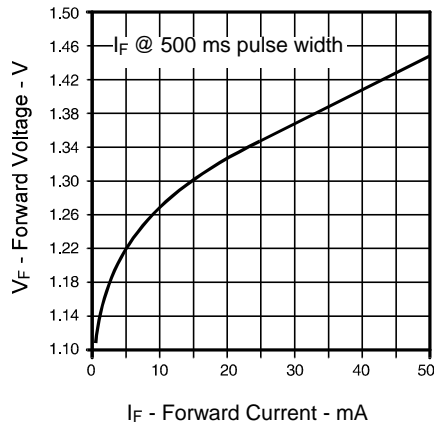
Type OPB690

Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

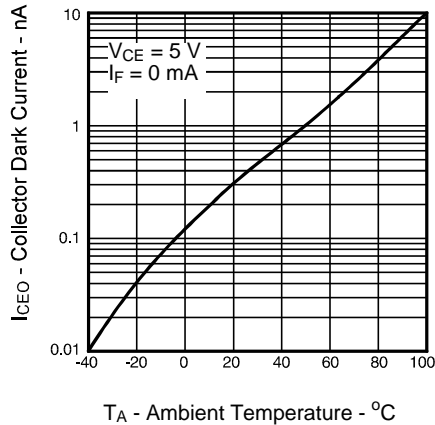
SYMBOL	PARAMETER	MIN	MAX	UNITS	TEST CONDITIONS
Input Diode					
V_F	Forward Voltage		1.6	V	$I_F = 10\text{ mA}$
I_R	Reverse Current		100	μA	$V_R = 3.0\text{ V}$
Output Phototransistor					
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	30		V	$I_C = 100\ \mu\text{A}$
I_{ECO}	Emitter Reverse Current		100	μA	$V_{EC} = 0.4\text{ V}$
I_{CEO}	Collector-Emitter Dark Current		100	nA	$V_{CE} = 5\text{ V}$
Coupled					
V_{SAT}	Saturation Voltage		0.4	V	$I_F = 10\text{ mA}$, $I_C = 100\ \mu\text{A}$, Gap unblocked
$I_{C(ON)}$	On-State Collector Current	600		μA	$I_F = 10\text{ mA}$, $V_{CE} = 5\text{ V}$

SLOTTED OPTICAL SWITCHES

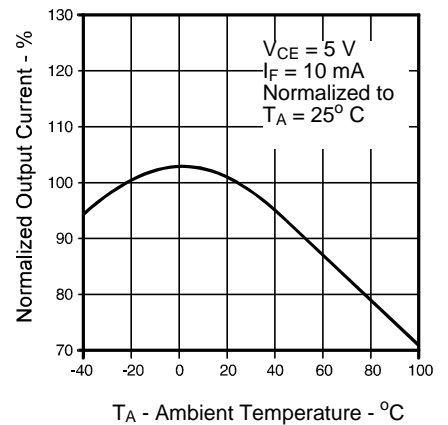
Forward Current vs Forward Voltage Input Diode



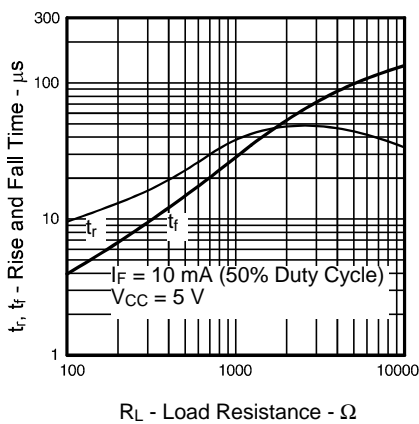
Collector Dark Current vs Ambient Temperature



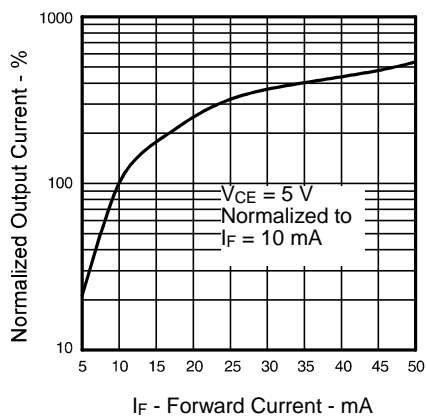
Normalized Output Current vs Ambient Temperature



Rise and Fall Time vs Load Resistance



Normalized Output Current vs Forward Current



Normalized Forward Voltage vs Ambient Temperature

