

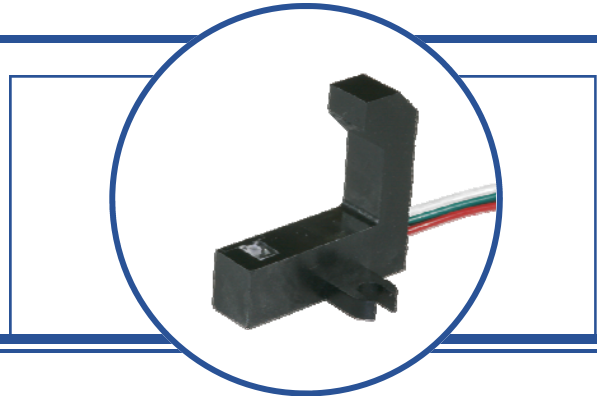
# Slotted Optical Switch

## OPB420AZ & OPB420BZ



### Features:

- Non-contact switching
- Right Angle Sensor: LED in tower, photosensor in base
- Choice of output configuration
- Optical line can be broken in three axis
- 24" minimum, 26 AWG UL approved wire leads



### Description:

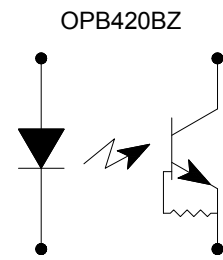
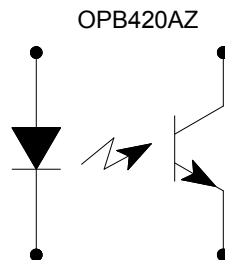
The **OPB420** series optical switch consists of an infrared emitting diode (LED) and a phototransistor. The LED is mounted on the tower with the phototransistor mounted on the base of a right angle shape package. The L-Shape or right angle package configuration allows for an opaque object to block the light beam from a multitude of directions including the X-axis Y-axis and Z-axis. The optical center line between the emitter and photosensor is at 45° from the mounting base of the device. The **OPB420AZ** utilizes a phototransistor with a current output proportional to the input drive current of the LED. The **OPB420BZ** utilizes a phototransistor with a base-emitter resistance ( $R_{BE}$ ) which provides protection from low level light conditions. **The OPB420BZ** is ideal for applications that require an enhanced contrast ratio and immunity to background irradiance, such as detection of semi-transparent media.

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

### Applications:

- Non-contact interruptive object sensing
- Tray-out sensor
- Low paper tray sensor
- Corner sensor
- Printers
- Copying machines
- Paper sorting equipment
- Amusement gaming equipment
- Door sensor
- Optical Switch

Part #	LED Wavelength	PhotoSensor
OPB420AZ	880 nm	Phototransistor
OPB420BZ		$R_{BE}$ Phototransistor

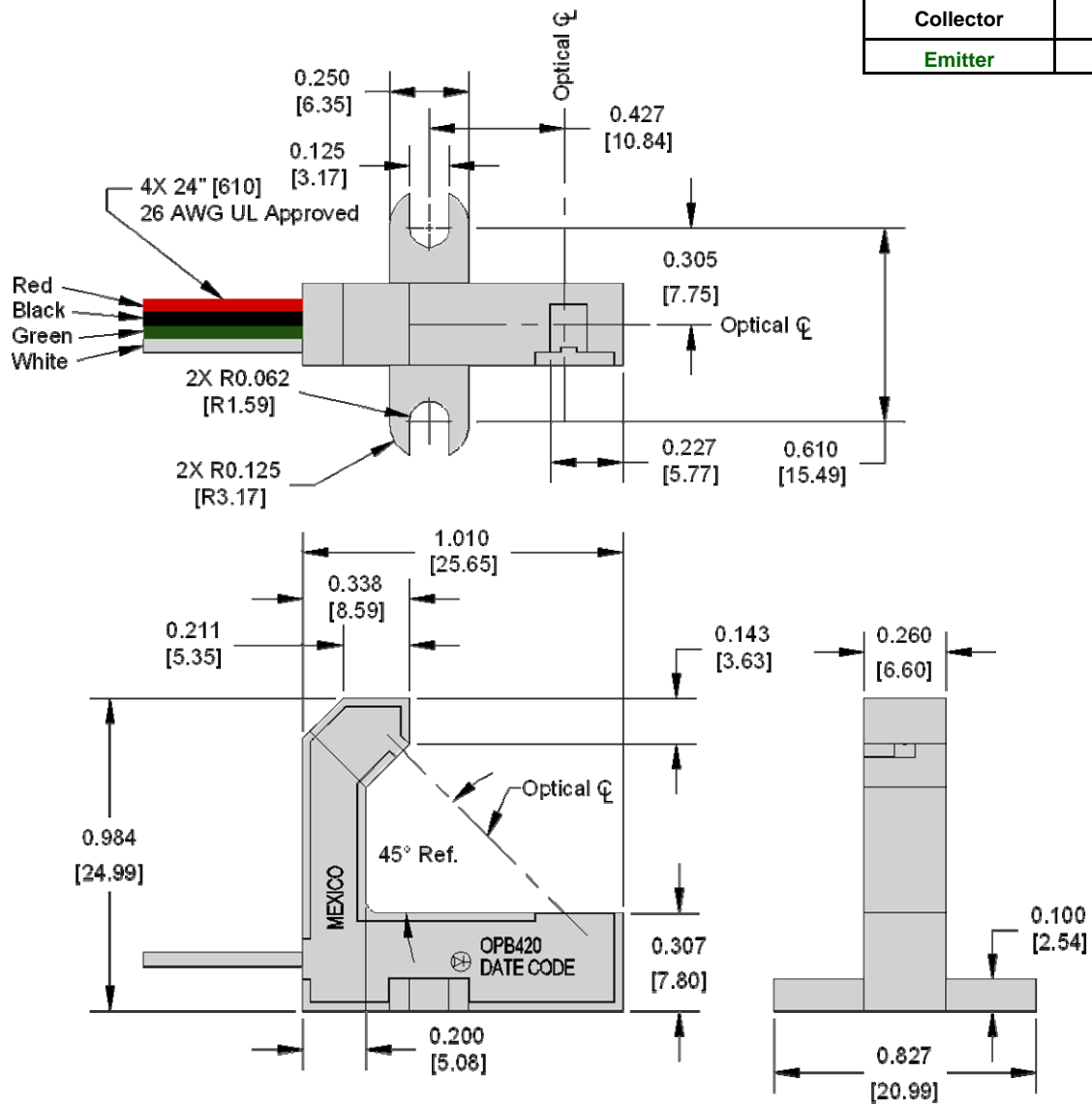


RoHS

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

## Mechanical Package Information

Description	Wire Color
Anode	Red
Cathode	Black
Collector	White
Emitter	Green



Dimensions are in Inches [Millimeters]

Tolerances  $\pm 0.010$ " [0.25mm]

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**Phototransistor Version**

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

Storage & Operating Temperature Range	-40° C to +85° 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**

Continuous Forward Current	50 mA
Peak Forward Current (1 $\mu\text{s}$ pulse width, 300 pps)	1 A
Reverse Voltage	2 V
Power Dissipation <sup>(2)</sup>	100 mW

**Output Phototransistor**

Collector-Emitter Breakdown Voltage OPB420AZ OPB420BZ	30 V 24 V
Power Dissipation <sup>(2)</sup>	100 mW

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

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
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**Input Diode** (See OP240 or OP265 for additional information)

$V_F$	Forward Voltage	1.2	-	1.7	V	$I_F = 20\text{ mA}$
$I_R$	Reverse Current	-	-	100	$\mu\text{A}$	$V_R = 2\text{ V}$

**Output Phototransistor** (See OP505 or OP705 for additional information)

$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage OPB420AZ OPB420BZ	30 24	- -	- -	V	$I_C = 1\text{ mA}$ $I_C = 100\ \mu\text{A}$
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage OPB420AZ OPB420BZ	5.0 0.4	- -	- -	V	$I_E = 100\ \mu\text{A}$
$I_{CEO}$	Collector-Emitter Dark Current	-	-	100	nA	$V_{CE} = 10\text{ V}, I_F = 0, E_E = 0$

**Combined**

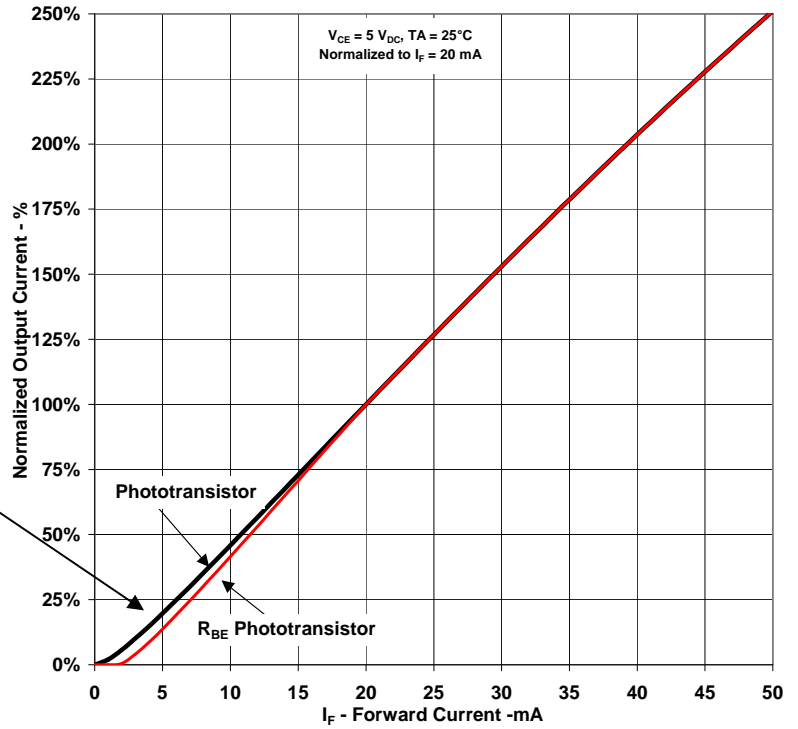
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	-	-	0.4	V	$I_C = 250\ \mu\text{A}, I_F = 20\text{ mA}$
$I_{C(ON)}$	On-State Collector Current	1.0	-	10.0	mA	$V_{CE} = 5.0\text{ V}, I_F = 20\text{ mA}$
$I_{C(OFF)}$	Off-State Collector Current— OPB420BZ	-	-	450	$\mu\text{A}$	$V_{CE} = 5\text{ V}, I_F = 1\text{ mA}$ <sup>(5)</sup>

Notes:

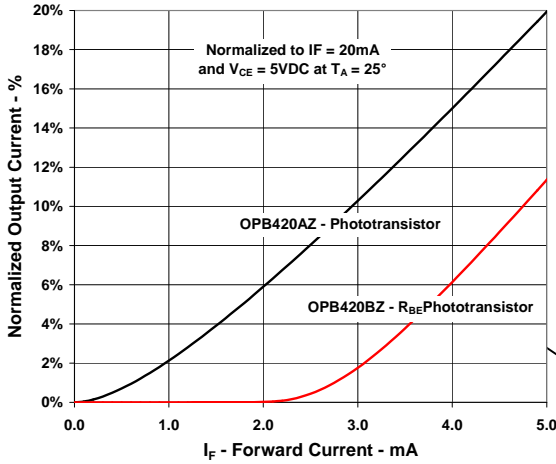
- (1) RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering.
- (2) Derate linearly 1.67 mW/°C above 25 ° C..
- (3) Methanol or isopropanol are recommended as cleaning agents. Plastic housing is soluble in chlorinated hydrocarbons and ketones.
- (4) All parameters were tested using pulse technique.
- (5) Simulated optical path blocked with infrared semi-transparent object

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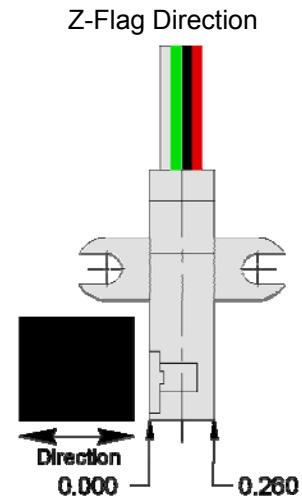
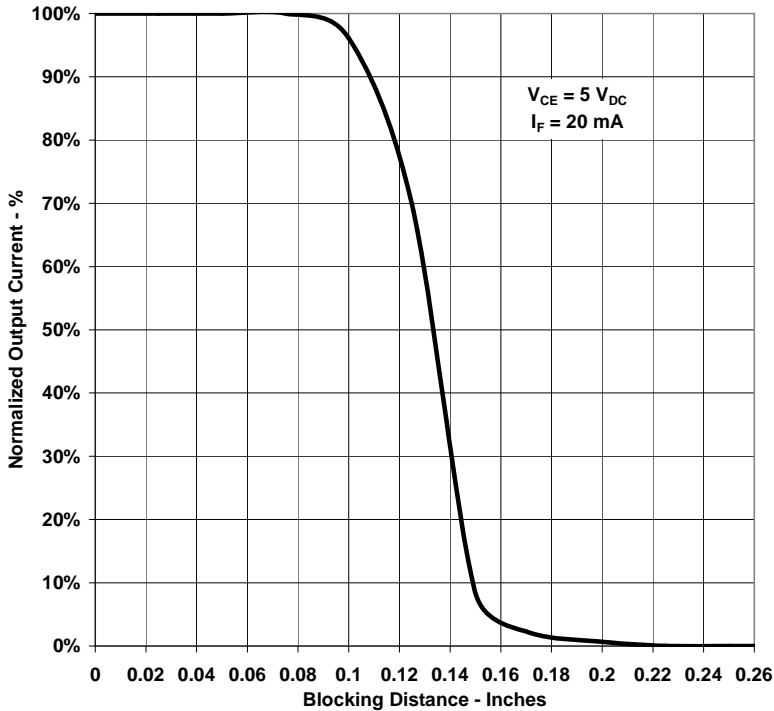
**Typical Output Current Vs Forward Current**



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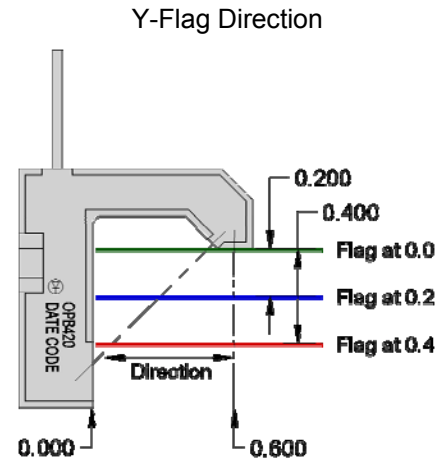
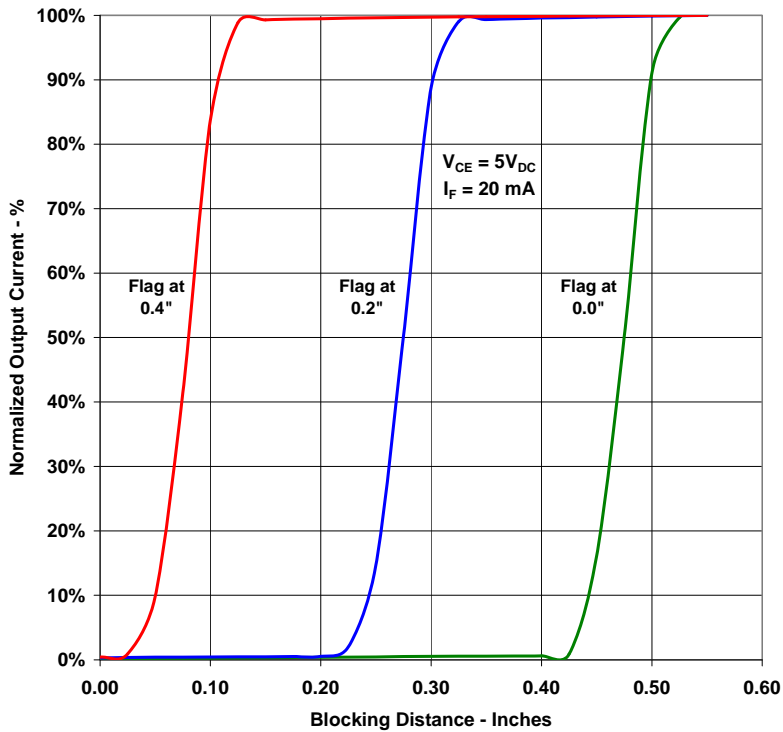


**Typical Output Current Vs Distance**  
 (Z Axis Blocked)

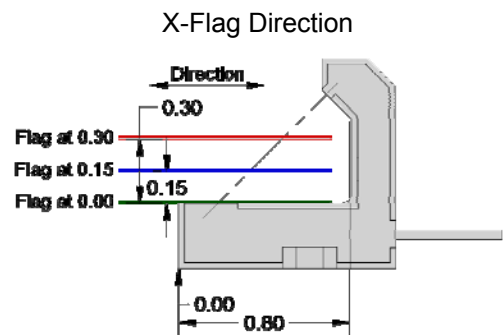
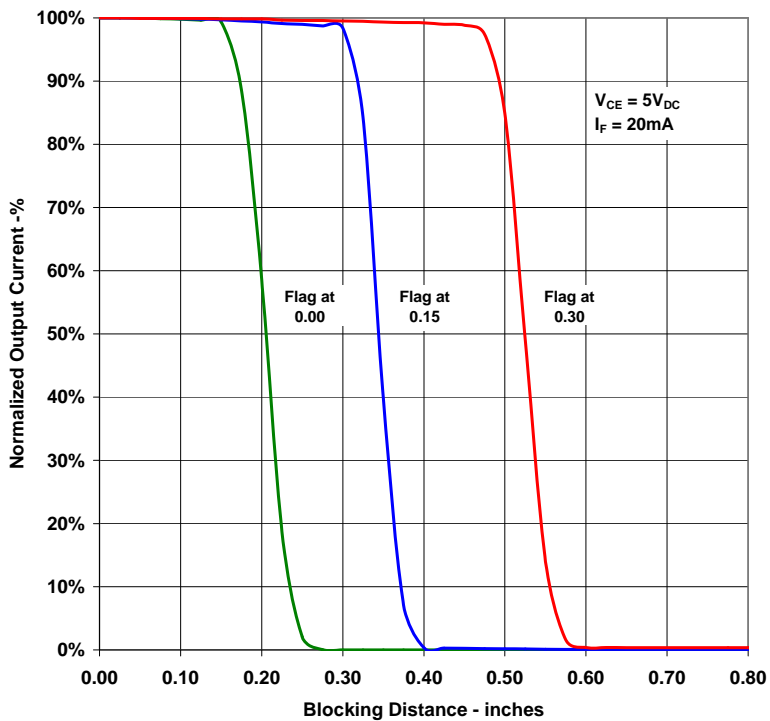


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**Typical Output Current Vs Distance (Y-Axis Blocked)**

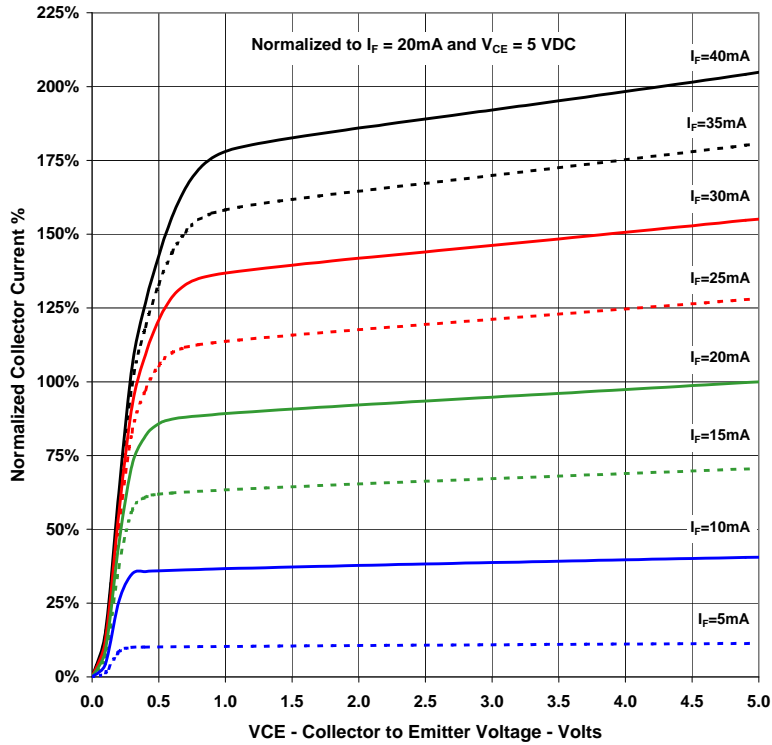


**Typical Output Current Vs Distance X-Axis Blocked**

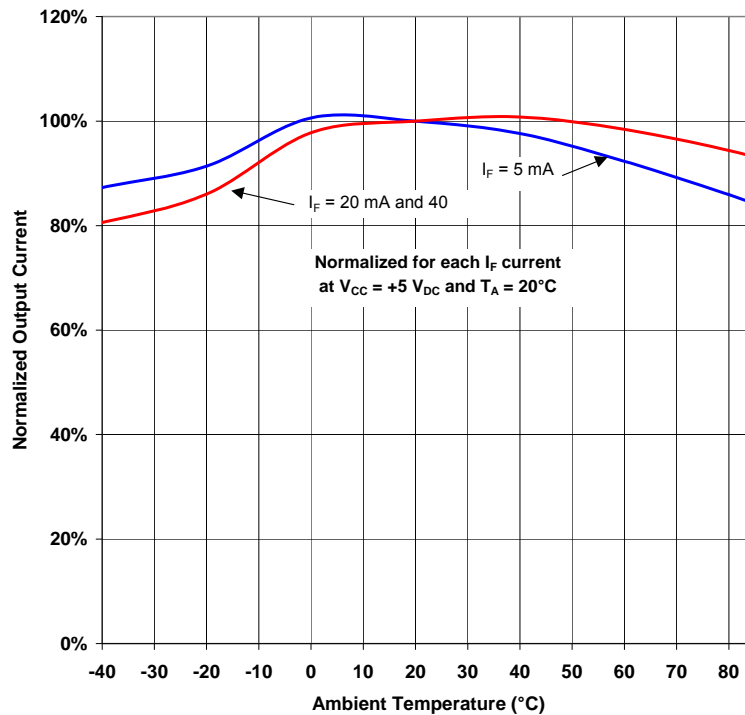


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Typical Collector Current vs Collector to Emitter Voltage



Typical Output Current vs Ambient Temperature



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