

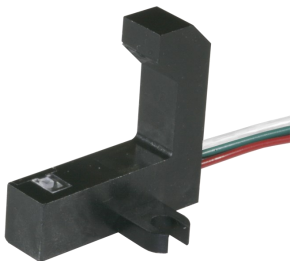
# Slotted Optical Switch

## 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:

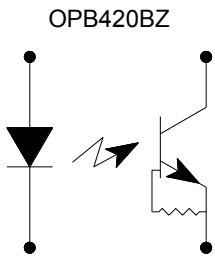
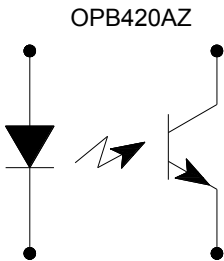
The OPB420 series optical switch consists of an infrared emitting diode (LED) and a phototransistor. The LED is mounted on the tower with the phototransistor mounted on the base of a right angle shape package. The L-Shape or right angle package configuration allows for an opaque object to block the light 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<sub>BE</sub>) 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 <sub>BE</sub> Phototransistor



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## Electrical Specifications

### Phototransistor Version

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

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

### 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	$I_C = 1\text{ mA}$ $I_C = 100\text{ }\mu\text{A}$
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage OPB420AZ OPB420BZ	5.0 0.4	- -	- -	V	$I_E = 100\text{ }\mu\text{A}$
$I_{CEO}$	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	$I_C = 250\text{ }\mu\text{A}$ , $I_F = 20\text{ mA}$
$I_{C(ON)}$	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/ $^{\circ}\text{C}$  above  $25^{\circ}\text{C}$ .
- (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

#### General Note

TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics' own data and is considered accurate at time of going to print.

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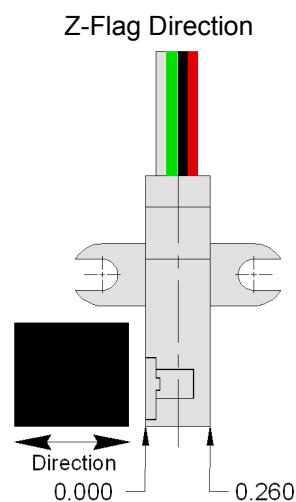
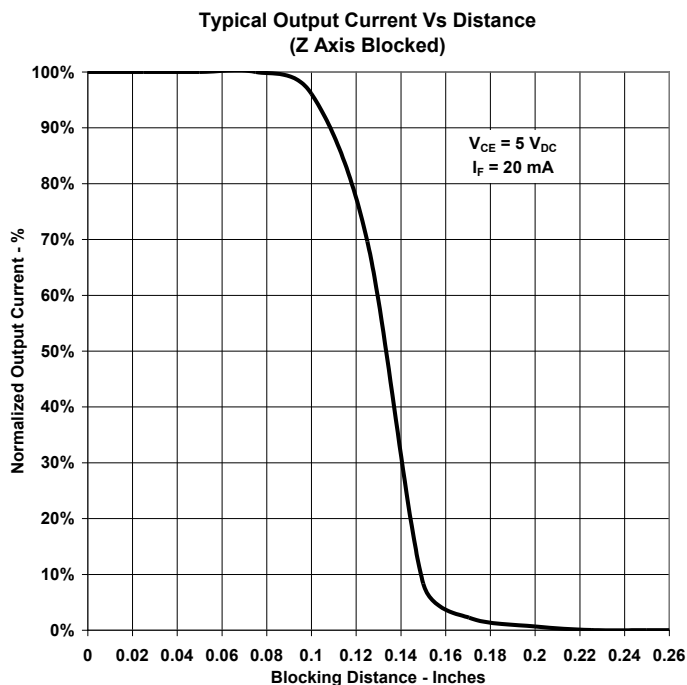
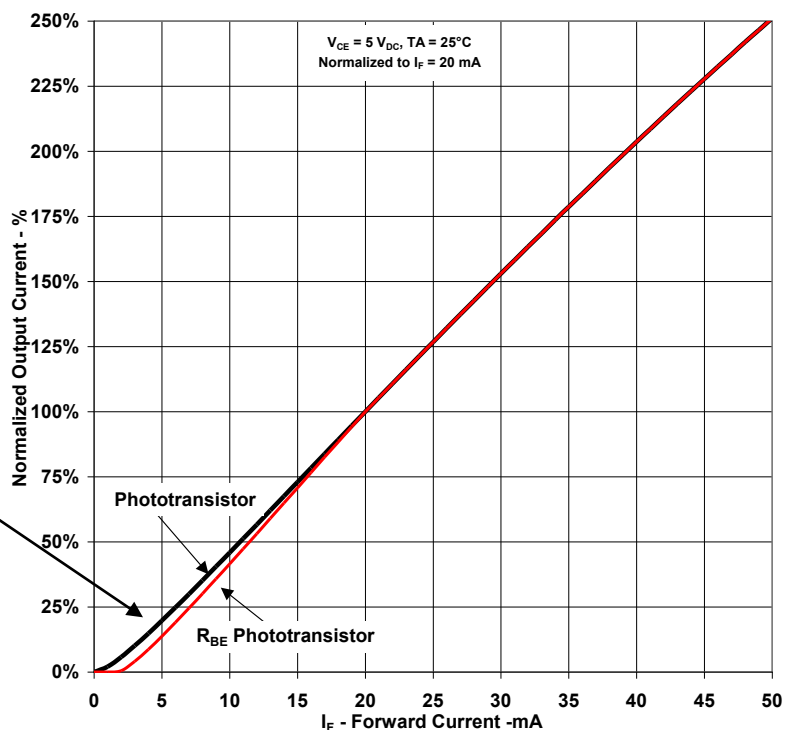
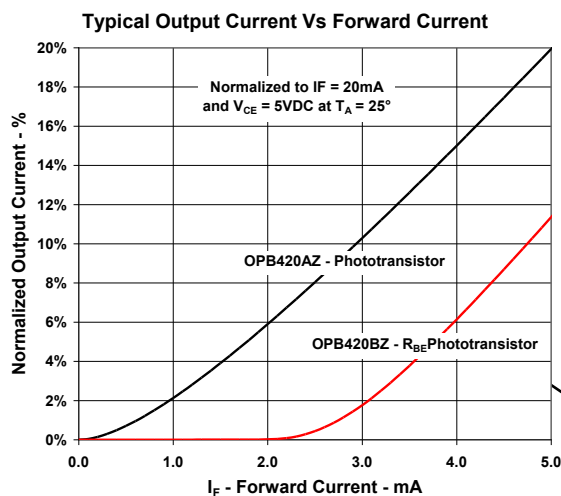
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## Performance

Typical Output Current Vs Forward Current



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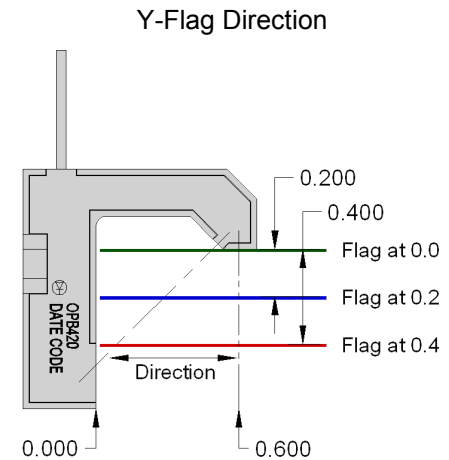
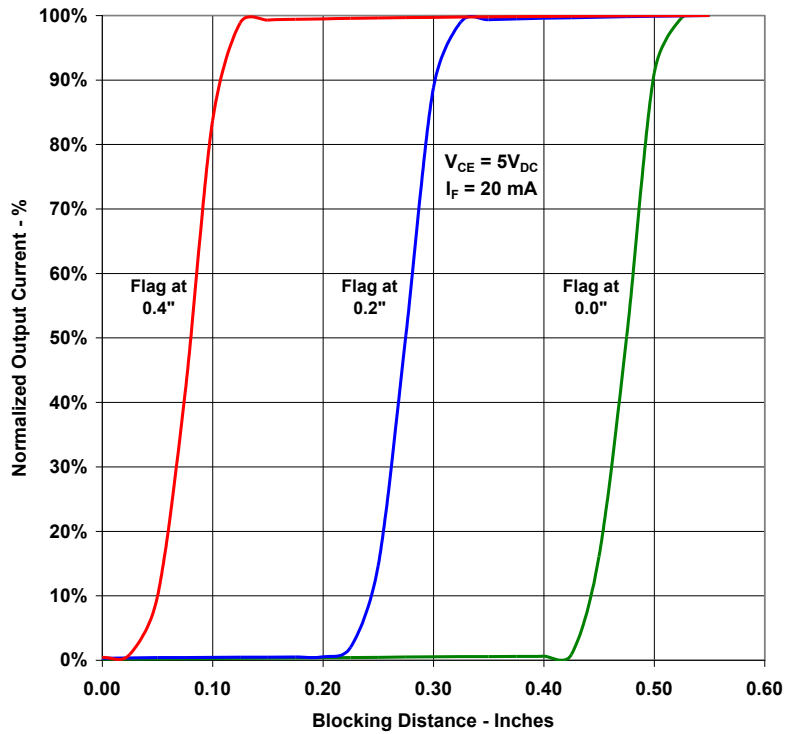
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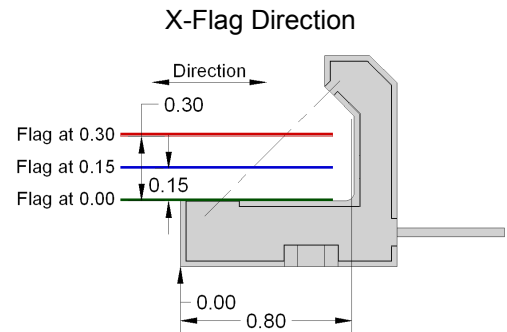
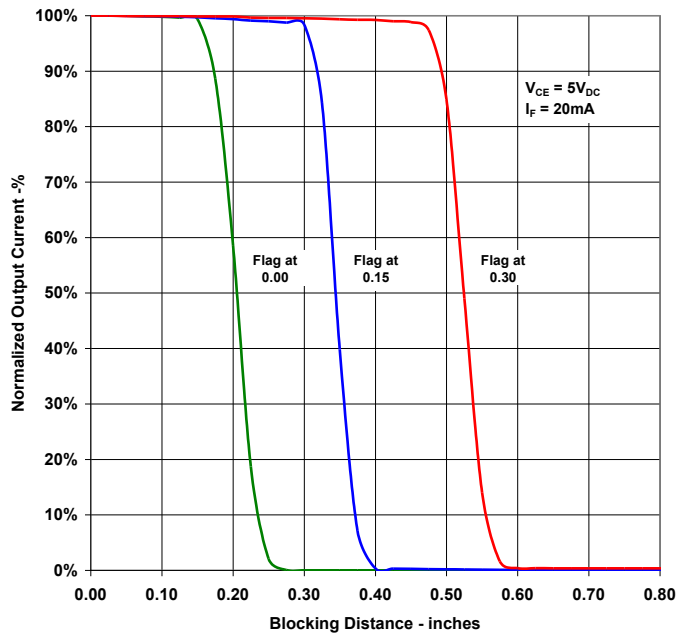


## Performance

Typical Output Current Vs Distance (Y-Axis Blocked)



Typical Output Current Vs Distance X-Axis Blocked



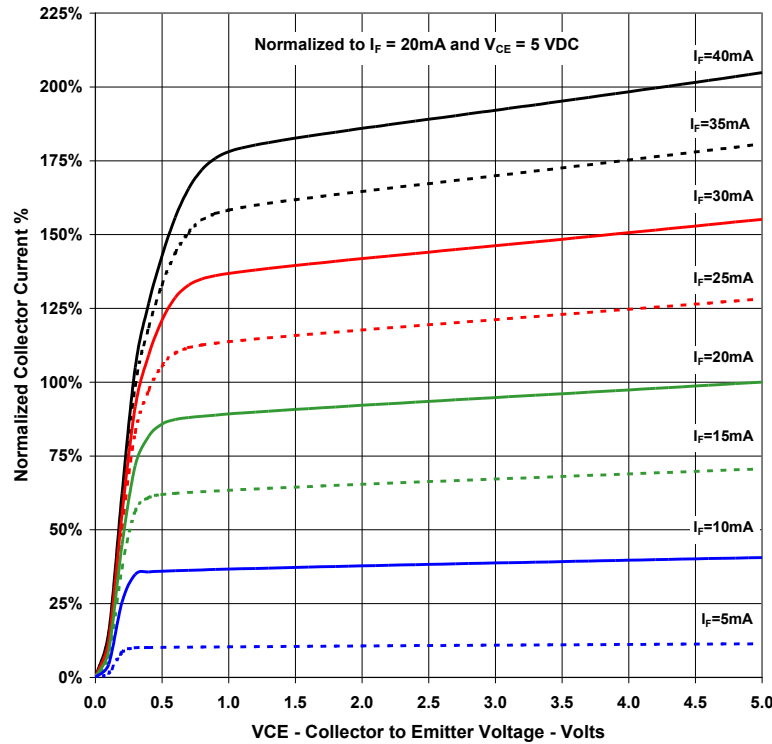
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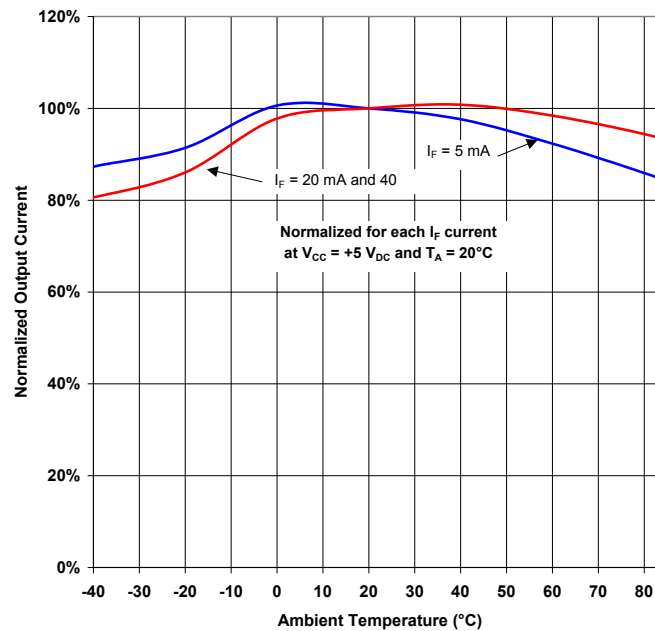
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### Performance

Typical Collector Current vs Collector to Emitter Voltage



Typical Output Current vs Ambient Temperature



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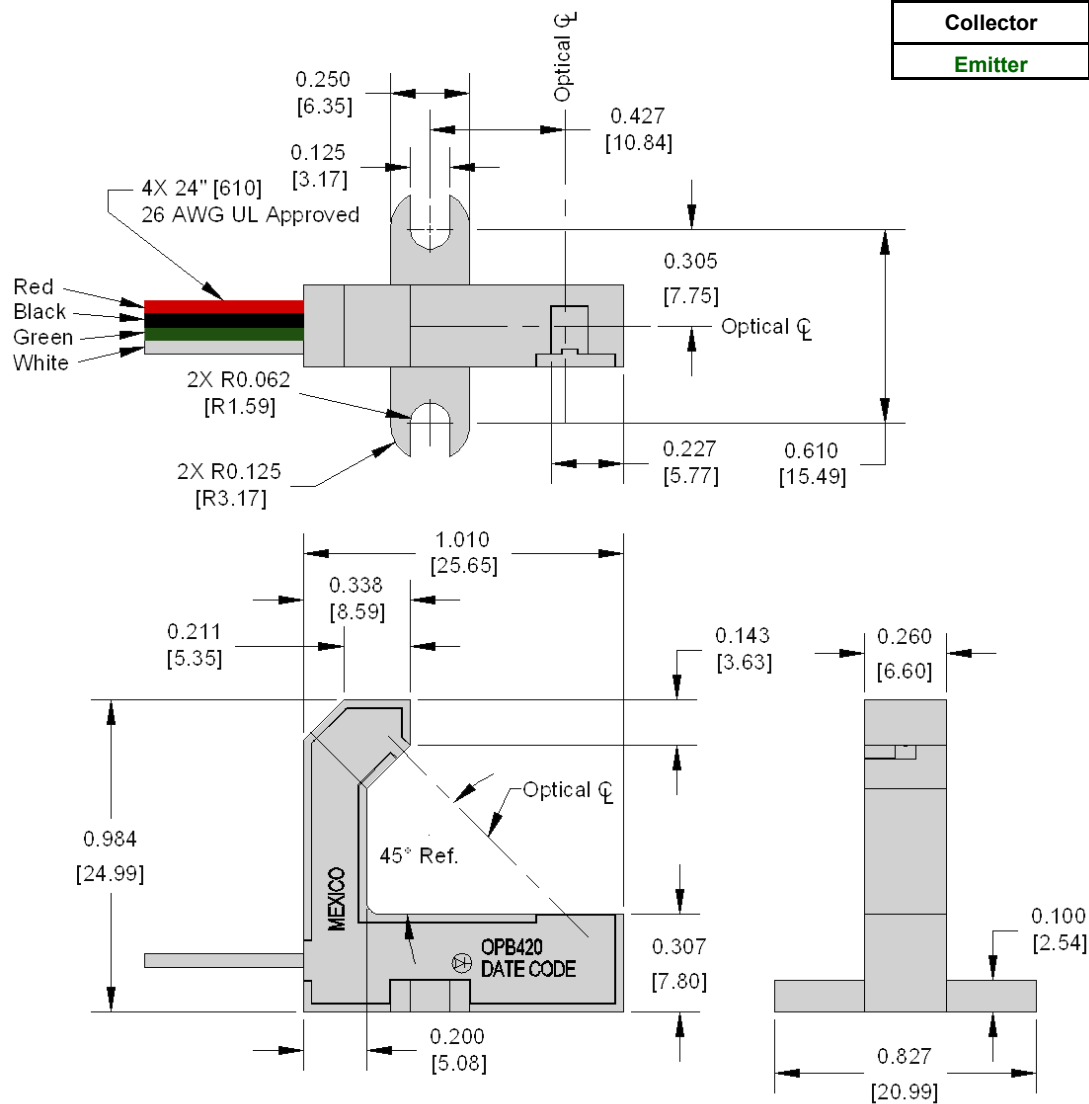
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## Packaging Mechanical Package Information

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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