

## FEATURES:

- Bar code reader / fine line sensor
- 0.007" - 0.013" resolution
- Compact size
- Glass lens

## PRODUCT DESCRIPTION

Opto Technology's OTBC-06XX series combines two emitters, a lens and photodetector into one low cost plastic housing. The rectangular aperture inside the package offers high resolution with good depth of field. The OTBC-068X has two 940nm infrared emitting diodes with PIN Diode or Phototransistor and the OTBC-069X has two 660nm visible light emitting diodes with either sensor option. Custom apertures for these devices are available upon request.

## ABSOLUTE MAXIMUM RATINGS

### General

Storage Temperature Range----- - 55°C to +100°C  
 Operating Temperature Range----- - 40°C to +85°C  
 Lead Soldering Temperature (1/16" from case  
 for 5 seconds soldering iron, 10 seconds flow soldering)----- 260°C

### Infrared Emitter (940 nm)

Reverse Voltage ----- 5 V  
 Continuous Forward Current ----- 25 mA  
 Power Dissipation ----- 100 mW

### Visible Emitter (660 nm)

Reverse Voltage ----- 4 V  
 Continuous Forward Current ----- 20mA  
 Power Dissipation ----- 70 mW

### Phototransistor

Collector-Emitter Voltage ----- 35 V  
 Emitter-Collector Voltage ----- 6 V  
 Power Dissipation (Derate 2.4 mW/°C above 25°C) ----- 250 mW

### PIN Diode

Reverse Voltage ----- 35V  
 Dark Current  $V_r=20V$  ----- 150nA  
 Power Dissipation (Derate 1.5 mW/°C above 25°C) ----- 150 mW



### Infrared Emitter

| Parameter  | Symbol         | Min | Typ | Max  | Units   |
|--|----------------|-----|-----|------|---------|
| Forward Voltage (I <sub>F</sub> = 20 mA)           | V <sub>F</sub> |     |     | 1.45 | V       |
| Reverse Current (V <sub>R</sub> = 5 V)             | I <sub>R</sub> |     |     | 100  | μA      |
| Peak Wavelength (I <sub>F</sub> = 20 mA)           | λ <sub>P</sub> |     | 940 |      | nm      |
| Radiant Intensity (I <sub>F</sub> = 20 mA)         | I              | 1.3 | 2.5 |      | mW/sr   |
| Spectral Bandwidth at 50% (I <sub>F</sub> = 20 mA) | Δλ             |     | 50  |      | nm      |
| Half Intensity Beam Angle                          | θ              |     | 10  |      | Degrees |

### Visible Emitter

| Parameter  | Symbol         | Min | Typ   | Max | Units   |
|--|----------------|-----|-------|-----|---------|
| Forward Voltage (I <sub>F</sub> = 20 mA)           | V <sub>F</sub> |     | 2.1   | 2.8 | V       |
| Reverse Current (V <sub>R</sub> = 4 V)             | I <sub>R</sub> |     |       | 100 | μA      |
| Peak Wavelength (I <sub>F</sub> = 20 mA)           | λ <sub>P</sub> |     | 660   |     | nm      |
| Spectral Bandwidth at 50% (I <sub>F</sub> = 20 mA) | Δλ             |     | 20    |     | nm      |
| Half Intensity Beam Angle                          | 2 θ            |     | 10-20 |     | Degrees |

### Phototransistor

| Parameter   | Symbol               | Min | Typ | Max | Units |
|---|----------------------|-----|-----|-----|-------|
| Light Current (E <sub>e</sub> =1.0mW/cm <sup>2</sup> , V <sub>CE</sub> =5V) | I <sub>CE(ON)</sub>  | 1   | 2.8 |     | mA    |
| Dark Current (E <sub>e</sub> =0, V <sub>CE</sub> =10V)                      | I <sub>CE0</sub>     |     |     | 60  | nA    |
| Saturation Voltage (I <sub>C</sub> =1.0mA)                                  | V <sub>CE(SAT)</sub> |     |     | 0.5 | V     |
| Rise Time (V <sub>CC</sub> =5V, R <sub>L</sub> =100Ω)                       | T <sub>r</sub>       |     | 6   |     | μs    |
| Fall Time (V <sub>CC</sub> =5V, R <sub>L</sub> =100Ω)                       | T <sub>f</sub>       |     | 8   |     | μs    |

### Pin Diode

| Parameter  | Symbol         | Min | Typ | Max | Units |
|--|----------------|-----|-----|-----|-------|
| Light Current (E <sub>e</sub> =1.0mW/cm <sup>2</sup> ) | I <sub>L</sub> | 8   | 20  |     | μA    |
| Dark Current (E <sub>e</sub> =0, V <sub>r</sub> =20V)  | I <sub>D</sub> |     |     | 100 | nA    |
| Total Capacitance (V=0, f= 1 MHz)                      | C <sub>t</sub> |     | 40  |     | pF    |
| Rise Time ( R <sub>L</sub> =1kΩ)                       | T <sub>r</sub> |     | 1   |     | μs    |
| Fall Time ( , R <sub>L</sub> =1kΩ)                     | T <sub>f</sub> |     | 1   |     | μs    |

### Coupled Characteristics

| Parameter  | Symbol              | Min | Typ  | Max | Units |
|--|---------------------|-----|------|-----|-------|
| Light Current (I <sub>F</sub> = 20 mA, V <sub>CE</sub> = 5V, d = 0.225 in, OTBC-0680-X2X) <sup>1</sup> | I <sub>CE(ON)</sub> |     | 5.0  |     | μA    |
| Dark Current (I <sub>F</sub> = 0 mA, V <sub>CE</sub> = 5V, OTBC-0680-X2X) <sup>2</sup>                 | I <sub>CE0</sub>    |     |      | 40  | nA    |
| Light Current (I <sub>F</sub> = 20 mA, V <sub>CC</sub> = 5V, d = 0.225 in, OTBC-0681-X2X) <sup>1</sup> | I <sub>CE(ON)</sub> |     | 0.02 |     | μA    |
| Dark Current (I <sub>F</sub> = 0 mA, V <sub>CC</sub> = 5V, OTBC-0681-X2X) <sup>2</sup>                 | I <sub>CE0</sub>    |     |      | 5   | nA    |
| Light Current (I <sub>F</sub> = 20 mA, V <sub>CE</sub> = 5V, d = 0.225 in, OTBC-0690-X2X) <sup>1</sup> | I <sub>CE(ON)</sub> |     | 5.0  |     | μA    |
| Dark Current (I <sub>F</sub> = 0 mA, V <sub>CE</sub> = 5V, OTBC-0690-X2X) <sup>2</sup>                 | I <sub>CE0</sub>    |     |      | 40  | nA    |
| Light Current (I <sub>F</sub> = 20 mA, V <sub>CC</sub> = 5V, d = 0.225 in, OTBC-0691-X2X) <sup>1</sup> | I <sub>CE(ON)</sub> |     | 0.02 |     | μA    |
| Dark Current (I <sub>F</sub> = 0 mA, V <sub>CC</sub> = 5V, OTBC-0691-X2X) <sup>2</sup>                 | I <sub>CE0</sub>    |     |      | 5   | nA    |

<sup>1</sup> Reflecting surface is Eastman Kodak neutral white test card having a 90% diffused reflectance.

<sup>2</sup> No reflective surface

### Reflective Surface

| Parameter                             | Symbol         | Min   | Typ  | Max | Units |
|---------------------------------------|----------------|-------|------|-----|-------|
| Element Contrast                      |                | (80%) |      |     | %     |
| Diffused Reflectance                  |                | (90%) |      |     | %     |
| Element Width ( 0.002x0.045 Aperture) | W <sub>N</sub> | 0.007 |      |     | in    |
| Narrow Element to Narrow Space Ratio  |                |       | 0.95 |     |       |

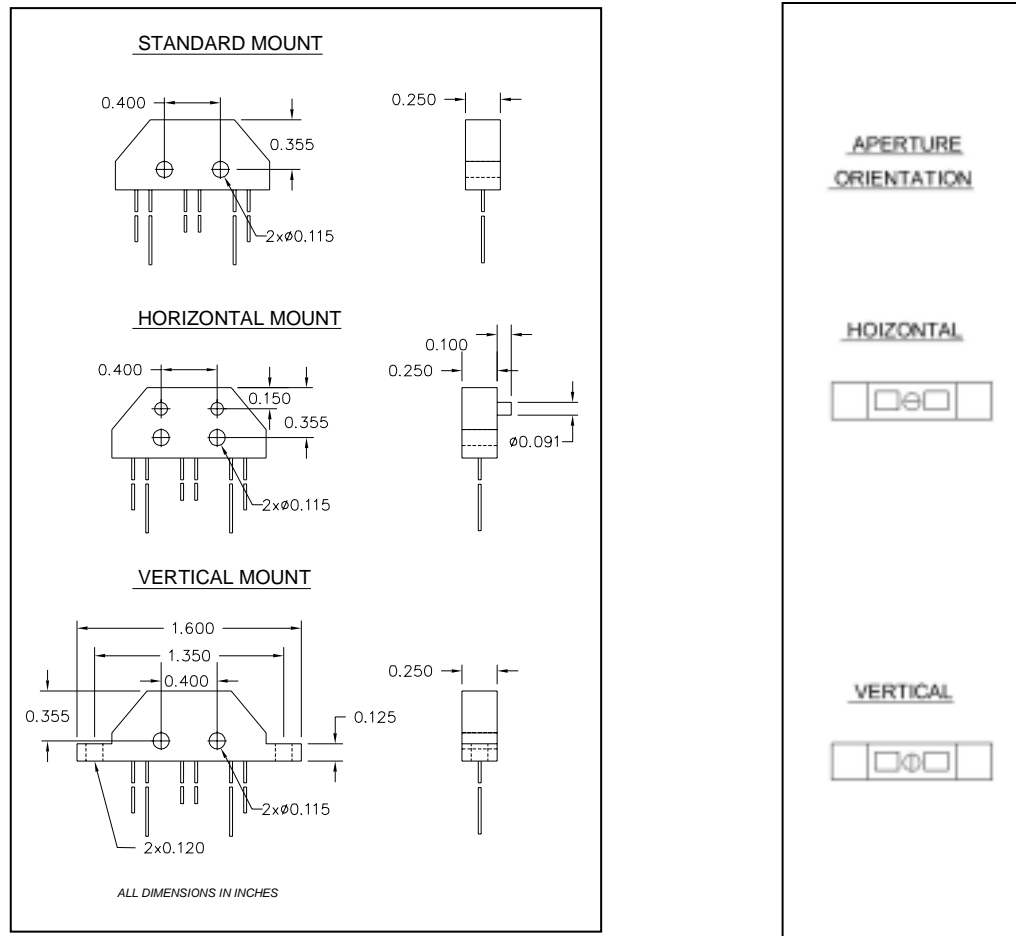
Product Specifications (T<sub>A</sub> = 25°C unless noted)

### ORDERING INFORMATION



**OPTO TECHNOLOGY, INC.**

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## OTBC-06XX-XXX

**Emitter:**  
(8) 940 nm Infrared  
(9) 660 nm Visible Red

**Sensor:**  
(0) Phototransistor  
(1) Photodiode

**Aperture Orientation:**  
(H) Horizontal  
(V) Vertical

**Aperture Size:**  
(0) 0.006" x 0.110"  
(1) 0.003" x 0.045"  
(2) 0.002" x 0.045"  
(C) Custom

**Mounting Configuration:**  
(H) Horizontal  
(V) Vertical  
(S) Standard

The vertical model has mounting tabs from both sides.



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