The OPB460, OPB470, OPB480, and OPB490 series of Photologic® photo integrated circuit switches provide optimum flexibility for the design engineer. Building from a standard housing with a 0.125” (3.180 mm) wide slot, a user can specify the type and polarity of TTL output, discrete shell material, aperture width and choice of mounting configurations. OPB460 through OPB473 have 0.425” (10.795 mm) PCBoard leads with 0.320” (8.1 mm) spacing. OPB480 through OPB493 have 24” (609 mm) 26 AWG wires (UL approved wires).

All devices in this series exhibit performance over supply voltages ranging from 4.5 V to 16.0 V, and may be specified as buffered or inverted with 10 kW Pull-up or Open Collector output. Devices are also TTI/LSTTL compatible and can drive up to 10 TTL loads.

Custom electrical, wire and 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
- Choice of pins or wires mounting configuration
- Choice of aperture
- Choice of output configuration
- Choice of opaque or IR transmissive shell material
- Data rates to 250 kBaud
- Low power consumption

Part Number Guide — OPB460, OPB470, OPB480, OPB490 Series

All PCBoard Versions RoHS Compliant:
Z = Wire Version RoHS Compliant

Sensor Aperture:
1 = 0.010” [0.25 mm]

Emitter Aperture:
1 = 0.010” [0.25 mm]

Mounting Configurations:
L — Emitter side mounting tab only
N — No mounting tabs
P — Sensor side mounting tab only
T — Two mounting tabs

Electrical Specifications:
0 — Buffered 10 kΩ Output
1 — Buffered Open-Collector Output
2 — Inverted 10 kΩ Output
3 — Inverted Open-Collector Output

OPTEK Assembly
Photologic™ Sensor Family
Discrete Housing Material:
6 — Transmissive Shell, PCBoard Mountable
7 — Opaque Shell, PCBoard Mountable
8 — Transmissive Shell, Wire Termination
9 — Opaque Shell, Wire Termination

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.

© TT electronics plc

OPTEK Technology, Inc.
1645 Wallace Drive, Carrollton, TX 75006Ph: +1 972 323 2200
www.optekinc.com / www.ttelelectronics.com

Issue B   09/2016   Page 1
TOLERANCE DIMENSIONS ARE: ± .25mm [± .010”]

CONTAINS POLYSULFONE
To avoid stress cracking, we suggest using ND Industries’ Vibra-Tite for thread-locking. Vibra-Tite evaporates fast without causing structural failure in OPTEK’s molded plastics.
Applies to: OPB460, OPB470, OPB480, OPB490.

<table>
<thead>
<tr>
<th>Color-Pin</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red-1</td>
<td>Anode</td>
</tr>
<tr>
<td>Black-2</td>
<td>Cathode</td>
</tr>
<tr>
<td>White-3</td>
<td>Vcc</td>
</tr>
<tr>
<td>Blue-4</td>
<td>Output</td>
</tr>
<tr>
<td>Green-5</td>
<td>Ground</td>
</tr>
</tbody>
</table>

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.

© TT electronics plc

OPTEK Technology, Inc.
1645 Wallace Drive, Carrollton, TX 75006
Ph: +1 972 323 2200
www.optekinc.com | www.ttelelectronics.com

Issue 8 09/2016 Page 2
### Photologic® Slotted Optical Switch

**OPB460, OPB470, OPB480, OPB490 Series**

#### Absolute Maximum Ratings ($T_A = 25^\circ C$ unless otherwise noted)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Storage &amp; Operating Temperature Range</strong></td>
<td>-40° C to +85° C</td>
</tr>
<tr>
<td><strong>Lead Soldering Temperature</strong></td>
<td>260°C</td>
</tr>
<tr>
<td><strong>Supply Voltage, $V_{CC}$ (not to exceed 3 seconds)</strong></td>
<td>18 V</td>
</tr>
<tr>
<td><strong>Diode Forward DC Current</strong></td>
<td>40 mA</td>
</tr>
<tr>
<td><strong>Diode Reverse DC Voltage</strong></td>
<td>2 V</td>
</tr>
<tr>
<td><strong>Input Diode Power Dissipation</strong></td>
<td>75 mW</td>
</tr>
<tr>
<td><strong>Voltage at Output Lead (Open Collector Output)</strong></td>
<td>25 V</td>
</tr>
<tr>
<td><strong>Output Photologic® Power Dissipation</strong></td>
<td>200 mW</td>
</tr>
<tr>
<td><strong>Total Device Power Dissipation</strong></td>
<td>275 mW</td>
</tr>
</tbody>
</table>

**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 (OPB460, OPB470) or derate linearly 1.82 mW/°C above 25° C (OPB480, OPB490).
3. Derate linearly 1.50 mW/°C above 25° C (OPB460, OPB470) or derate linearly 1.64 mW/°C above 25° C (OPB480, OPB490).
4. Derate linearly 3.17 mW/°C above 25° C (OPB460, OPB470) or derate linearly 3.45 mW/°C above 25° C (OPB480, OPB490).
5. The OPB480/OPB490 series are terminated with 0.020” square leads designed for printed circuit board mounting.
6. The OPB480/OPB490 series of switches are terminated with 24” (609.600 mm) of 7-strand 26 AWG, UL rated insulated wire on each terminal. Insulation colors and functions are: red (anode), black (cathode), white ($V_{CC}$), blue (output) and green (ground). Other wire lengths and/or colors in addition to customer selected connectors are available. Contact your local representative or call the factory.
Photologic® Slotted Optical Switch

OPB460, OPB470, OPB480, OPB490 Series

OPB460/470/480/490 Buffered 10K Pull-Up

OPB461/471/481/491 Buffered Open-Collector

OPB462/472/482/492 Inverted 10K Pull-Up

OPB463/473/483/493 Inverted Open-Collector
## Photologic® Slotted Optical Switch

**OPB460, OPB470, OPB480, OPB490 Series**

### Electrical Characteristics (T<sub>A</sub> = 25° C unless otherwise noted)

<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>PARAMETER</th>
<th>MIN</th>
<th>TYP</th>
<th>MAX</th>
<th>UNITS</th>
<th>TEST CONDITIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Input Diode</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>V&lt;sub&gt;F&lt;/sub&gt;</td>
<td></td>
<td></td>
<td>1.7</td>
<td>V</td>
<td>I&lt;sub&gt;F&lt;/sub&gt; = 20 mA, T&lt;sub&gt;A&lt;/sub&gt; = 25° C</td>
</tr>
<tr>
<td></td>
<td>I&lt;sub&gt;R&lt;/sub&gt;</td>
<td>100</td>
<td>-</td>
<td></td>
<td>µA</td>
<td>V&lt;sub&gt;R&lt;/sub&gt; = 2 V, T&lt;sub&gt;A&lt;/sub&gt; = 25° C</td>
</tr>
<tr>
<td></td>
<td>Output Photologic® Sensor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>V&lt;sub&gt;CC&lt;/sub&gt;</td>
<td>4.5</td>
<td>-</td>
<td>16</td>
<td>V</td>
<td></td>
</tr>
<tr>
<td></td>
<td>I&lt;sub&gt;CCL&lt;/sub&gt;</td>
<td></td>
<td></td>
<td>7.5</td>
<td>mA</td>
<td>V&lt;sub&gt;CC&lt;/sub&gt; = 16 V, I&lt;sub&gt;F&lt;/sub&gt; = 0 mA(1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7.5</td>
<td>mA</td>
<td>V&lt;sub&gt;CC&lt;/sub&gt; = 16 V, I&lt;sub&gt;F&lt;/sub&gt; = 12 mA</td>
</tr>
<tr>
<td></td>
<td>I&lt;sub&gt;CCOH&lt;/sub&gt;</td>
<td></td>
<td></td>
<td>7.5</td>
<td>mA</td>
<td>V&lt;sub&gt;CC&lt;/sub&gt; = 16 V, I&lt;sub&gt;F&lt;/sub&gt; = 0 mA(1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7.5</td>
<td>mA</td>
<td>V&lt;sub&gt;CC&lt;/sub&gt; = 16 V, I&lt;sub&gt;F&lt;/sub&gt; = 12 mA</td>
</tr>
<tr>
<td></td>
<td>V&lt;sub&gt;OL&lt;/sub&gt;</td>
<td></td>
<td></td>
<td>0.4</td>
<td>V</td>
<td>V&lt;sub&gt;CC&lt;/sub&gt; = 4.5 V, I&lt;sub&gt;OL&lt;/sub&gt; = 16 mA, I&lt;sub&gt;F&lt;/sub&gt; = 0 mA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.4</td>
<td>V</td>
<td>V&lt;sub&gt;CC&lt;/sub&gt; = 4.5 V, I&lt;sub&gt;OL&lt;/sub&gt; = 12 mA(1)</td>
</tr>
<tr>
<td></td>
<td>V&lt;sub&gt;OH&lt;/sub&gt;</td>
<td></td>
<td></td>
<td></td>
<td>V</td>
<td>V&lt;sub&gt;CC&lt;/sub&gt; = 4.5 V to 16 V, No Load, I&lt;sub&gt;F&lt;/sub&gt; = 12 mA</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>V</td>
<td>V&lt;sub&gt;CC&lt;/sub&gt; = 4.5 V to 16 V, No Load, I&lt;sub&gt;F&lt;/sub&gt; = 0 mA</td>
</tr>
<tr>
<td></td>
<td>I&lt;sub&gt;OH&lt;/sub&gt;</td>
<td></td>
<td></td>
<td>14</td>
<td>µA</td>
<td>V&lt;sub&gt;CC&lt;/sub&gt; = 16 V, I&lt;sub&gt;F&lt;/sub&gt; = 12 mA, V&lt;sub&gt;OH&lt;/sub&gt; = 25 V, T&lt;sub&gt;A&lt;/sub&gt; = 25° C</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>14</td>
<td>µA</td>
<td>V&lt;sub&gt;CC&lt;/sub&gt; = 16 V, I&lt;sub&gt;F&lt;/sub&gt; = 0 mA, V&lt;sub&gt;OH&lt;/sub&gt; = 25 V, T&lt;sub&gt;A&lt;/sub&gt; = 25° C</td>
</tr>
<tr>
<td></td>
<td>I&lt;sub&gt;F(+)&lt;/sub&gt;</td>
<td></td>
<td></td>
<td>10</td>
<td>mA</td>
<td>V&lt;sub&gt;CC&lt;/sub&gt; = 5 V, T&lt;sub&gt;A&lt;/sub&gt; = 25° C</td>
</tr>
<tr>
<td></td>
<td>I&lt;sub&gt;F(+)/I&lt;sub&gt;F(-)&lt;/sub&gt;</td>
<td></td>
<td></td>
<td>1.4</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>t&lt;sub&gt;rt&lt;/sub&gt;</td>
<td></td>
<td></td>
<td>50</td>
<td>ns</td>
<td>V&lt;sub&gt;CC&lt;/sub&gt; = 5 V, T&lt;sub&gt;A&lt;/sub&gt; = 25° C, I&lt;sub&gt;F&lt;/sub&gt; = 0 or 12 mA</td>
</tr>
<tr>
<td></td>
<td>t&lt;sub&gt;PLH/PHL&lt;/sub&gt;</td>
<td></td>
<td></td>
<td>3</td>
<td>µs</td>
<td>R&lt;sub&gt;L&lt;/sub&gt; = 300 Ω to 5 V, C&lt;sub&gt;L&lt;/sub&gt; = 50 pF</td>
</tr>
</tbody>
</table>

**Notes:**

1. Normal application would be with light source blocked, simulated by I<sub>F</sub> = 0 mA.
2. All parameters tested using pulse technique.
OPB480T55 - Flag in Middle of Slot

Displacement Distance (inches)

0.00  0.05  0.10  0.15  0.20  0.25

0.00  0.05  0.10  0.15  0.20  0.25  0.30  0.35  0.40  0.45  0.50  0.55  0.60  0.65  0.70  0.75  0.80  0.85  0.90  0.95  1.00  1.05  1.10  1.15  1.20

Logic

OPB480T55 - Flag Next to Emitter

Displacement Distance (inches)

0.00  0.05  0.10  0.15  0.20  0.25

0.00  0.05  0.10  0.15  0.20  0.25  0.30  0.35  0.40  0.45  0.50  0.55  0.60  0.65  0.70  0.75  0.80  0.85  0.90  0.95  1.00  1.05  1.10  1.15  1.20

Logic

OPB480T55 - Flag Next to Sensor

Displacement Distance (inches)

0.00  0.05  0.10  0.15  0.20  0.25

0.00  0.05  0.10  0.15  0.20  0.25  0.30  0.35  0.40  0.45  0.50  0.55  0.60  0.65  0.70  0.75  0.80  0.85  0.90  0.95  1.00  1.05  1.10  1.15  1.20

Logic

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.
Photologic® Slotted Optical Switch
OPB460, OPB470, OPB480, OPB490 Series

OPB481N51 - Flag in Middle of Slot

OPB481N51 - Flag Next to Emitter

OPB481N51 - Flag Next to Sensor

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.

© TT electronics plc

OPTEK Technology, Inc.
1645 Wallace Drive, Carrollton, TX 75006
Ph: +1 972 323 2200
www.optekinc.com | www.ttelelectronics.com

Issue 8  09/2016  Page 7