

Types OPB930W, OPB940W Series

Electrical Characteristics ($T_A = -40^\circ\text{C}$ to $+70^\circ\text{C}$ unless otherwise noted)

| SYMBOL | PARAMETER | MIN | TYP | MAX | UNITS | TEST CONDITIONS |
|---|--|------|-----|------|---------------|--|
| Input Diode | | | | | | |
| V_F | Forward Voltage | | | 1.7 | V | $I_F = 20\text{ mA}$, $T_A = 25^\circ\text{C}$ |
| I_R | Reverse Current | | | 100 | μA | $V_R = 2\text{ V}$, $T_A = 25^\circ\text{C}$ |
| Output Photologic[®] Sensor | | | | | | |
| V_{CC} | Operating D.C. Supply Voltage | 4.75 | | 5.25 | V | |
| I_{CCL} | Low Level Supply Current: Buffered Totem-Pole Output Buffered Open-Collector Output | | | 15 | mA | $V_{CC} = 5.25\text{ V}$, $I_F = 0\text{ mA}^{(5)}$ |
| | Inverted Totem-Pole Output Inverted Open-Collector Output | | | 15 | mA | $V_{CC} = 5.25\text{ V}$, $I_F = 15\text{ mA}$ |
| I_{CCH} | High Level Supply Current: Buffered Totem-Pole Output Buffered Open-Collector Output | | | 15 | mA | $V_{CC} = 5.25\text{ V}$, $I_F = 15\text{ mA}$ |
| | Inverted Totem-Pole Output Inverted Open-Collector Output | | | 15 | mA | $V_{CC} = 5.25\text{ V}$, $I_F = 0\text{ mA}^{(5)}$ |
| V_{OL} | Low Level Output Voltage: Buffered Totem-Pole Output Buffered Open-Collector Output | | | 0.4 | V | $V_{CC} = 4.75\text{ V}$, $I_{OL} = 12.8\text{ mA}$ $I_F = 0\text{ mA}^{(5)}$ |
| | Inverted Totem-Pole Output Inverted Open-Collector Output | | | 0.4 | V | $V_{CC} = 4.75\text{ V}$, $I_{OL} = 12.8\text{ mA}$ $I_F = 15\text{ mA}$ |
| V_{OH} | High Level Output Voltage: Buffered Totem-Pole Output | 2.4 | | | V | $V_{CC} = 4.75\text{ V}$, $I_{OH} = -800\text{ mA}$ $I_F = 15\text{ mA}$ |
| | Inverted Totem-Pole Output | 2.4 | | | V | $V_{CC} = 4.75\text{ V}$, $I_{OH} = -800\text{ mA}$ $I_F = 0\text{ mA}^{(5)}$ |
| I_{OH} | High Level Output Current: Buffered Open-Collector Output | | | 100 | μA | $V_{CC} = 4.75\text{ V}$, $V_{OH} = 30\text{ V}$, $I_F = 15\text{ mA}$, $T_A = 25^\circ\text{C}$ |
| | Inverted Open-Collector Output | | | 100 | μA | $V_{CC} = 4.75\text{ V}$, $V_{OH} = 30\text{ V}$, $I_F = 0\text{ mA}$, $T_A = 25^\circ\text{C}$ |
| $I_{F(+)}$ | LED Positive-Going Threshold Current | | | 15 | mA | $V_{CC} = 5\text{ V}$, $T_A = 25^\circ\text{C}$ |
| $I_{F(+)} / I_{F(-)}$ | Hysteresis | | 2.0 | | | $V_{CC} = 5\text{ V}$ |
| I_{OS} | Short Circuit Output Current: Buffered Totem-Pole Output | -30 | | -100 | mA | $V_{CC} = 5.25\text{ V}$, $I_F = 15\text{ mA}$ Output = GND |
| | Inverted Totem-Pole Output | -30 | | -100 | mA | $V_{CC} = 5.25\text{ V}$, $I_F = 0\text{ mA}$ Output = GND |
| t_r, t_f | Output Rise Time, Output Fall Time | | 70 | | ns | $V_{CC} = 5\text{ V}$, $T_A = 25^\circ\text{C}$ $I_F = 0$ or 15 mA $R_L = 8\text{ TTL Loads (Totem-Pole)}$ $R_L = 360\ \Omega$ (Open-Collector) |
| t_{PLH}, t_{PHL} | Propagation Delay Low-High & High-Low | | 5.0 | | μs | |

SLOTTED OPTICAL SWITCHES

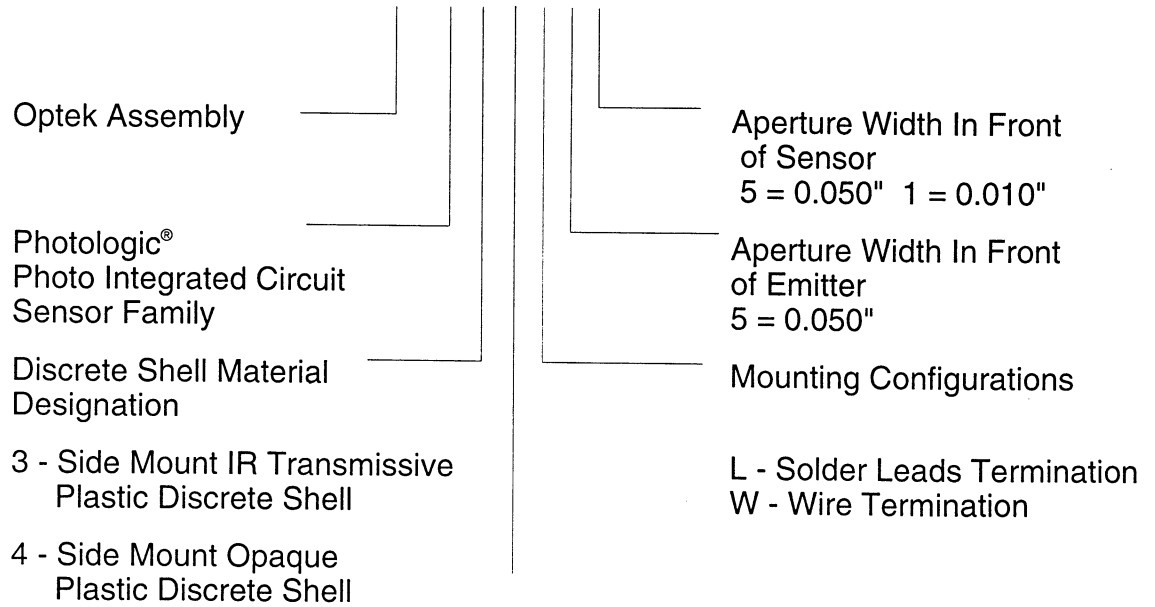
Housing

All housings are an opaque grade of injection-molded plastic to minimize the assembly's sensitivity to ambient radiation, both visible and near-infrared. Discrete shells (exposed on the parallel faces inside the device throat) are either IR transmissive plastic for applications where aperture contamination may occur or opaque plastic for maximum protection against ambient light.

Optek reserves the right to make changes at any time in order to improve design and to supply the best product possible.
 Optek Technology, Inc. 1215 W. Crosby Road Carrollton, Texas 75006 (972)323-2200 Fax (972)323-2396

PART NUMBER GUIDE

OPB 9 X X X X X

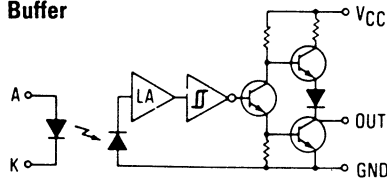


Electrical Specification Variations

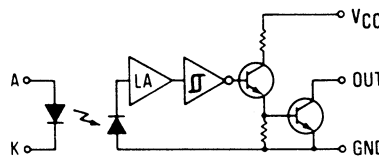
- 0 - Buffered Totem-Pole Output
- 1 - Buffered Open-Collector Output
- 2 - Inverted Totem-Pole Output
- 3 - Inverted Open-Collector Output

Schematics

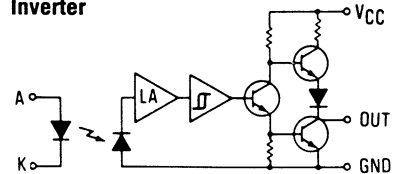
**OPB930, OPB940
(Totem-Pole Output)
Buffer**



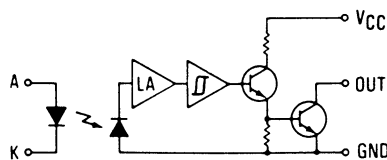
**OPB931, OPB941
(Open-Collector Output)
Buffer**



**OPB932, OPB942
(Totem-Pole Output)
Inverter**



**OPB933, OPB943
(Open-Collector Output)
Inverter**



Types OPB930W, OPB940W Series

Electrical Characteristics ($T_A = -40^\circ\text{C}$ to $+70^\circ\text{C}$ unless otherwise noted)

| SYMBOL | PARAMETER | MIN | TYP | MAX | UNITS | TEST CONDITIONS |
|---|--|------|-----|------|---------------|--|
| Input Diode | | | | | | |
| V_F | Forward Voltage | | | 1.7 | V | $I_F = 20\text{ mA}$, $T_A = 25^\circ\text{C}$ |
| I_R | Reverse Current | | | 100 | μA | $V_R = 2\text{ V}$, $T_A = 25^\circ\text{C}$ |
| Output Photologic[®] Sensor | | | | | | |
| V_{CC} | Operating D.C. Supply Voltage | 4.75 | | 5.25 | V | |
| I_{CCL} | Low Level Supply Current: Buffered Totem-Pole Output Buffered Open-Collector Output | | | 15 | mA | $V_{CC} = 5.25\text{ V}$, $I_F = 0\text{ mA}^{(5)}$ |
| | Inverted Totem-Pole Output Inverted Open-Collector Output | | | 15 | mA | $V_{CC} = 5.25\text{ V}$, $I_F = 15\text{ mA}$ |
| I_{CCH} | High Level Supply Current: Buffered Totem-Pole Output Buffered Open-Collector Output | | | 15 | mA | $V_{CC} = 5.25\text{ V}$, $I_F = 15\text{ mA}$ |
| | Inverted Totem-Pole Output Inverted Open-Collector Output | | | 15 | mA | $V_{CC} = 5.25\text{ V}$, $I_F = 0\text{ mA}^{(5)}$ |
| V_{OL} | Low Level Output Voltage: Buffered Totem-Pole Output Buffered Open-Collector Output | | | 0.4 | V | $V_{CC} = 4.75\text{ V}$, $I_{OL} = 12.8\text{ mA}$ $I_F = 0\text{ mA}^{(5)}$ |
| | Inverted Totem-Pole Output Inverted Open-Collector Output | | | 0.4 | V | $V_{CC} = 4.75\text{ V}$, $I_{OL} = 12.8\text{ mA}$ $I_F = 15\text{ mA}$ |
| V_{OH} | High Level Output Voltage: Buffered Totem-Pole Output | 2.4 | | | V | $V_{CC} = 4.75\text{ V}$, $I_{OH} = -800\text{ mA}$ $I_F = 15\text{ mA}$ |
| | Inverted Totem-Pole Output | 2.4 | | | V | $V_{CC} = 4.75\text{ V}$, $I_{OH} = -800\text{ mA}$ $I_F = 0\text{ mA}^{(5)}$ |
| I_{OH} | High Level Output Current: Buffered Open-Collector Output | | | 100 | μA | $V_{CC} = 4.75\text{ V}$, $V_{OH} = 30\text{ V}$, $I_F = 15\text{ mA}$, $T_A = 25^\circ\text{C}$ |
| | Inverted Open-Collector Output | | | 100 | μA | $V_{CC} = 4.75\text{ V}$, $V_{OH} = 30\text{ V}$, $I_F = 0\text{ mA}$, $T_A = 25^\circ\text{C}$ |
| $I_{F(+)}$ | LED Positive-Going Threshold Current | | | 15 | mA | $V_{CC} = 5\text{ V}$, $T_A = 25^\circ\text{C}$ |
| $I_{F(+)} / I_{F(-)}$ | Hysteresis | | 2.0 | | | $V_{CC} = 5\text{ V}$ |
| I_{OS} | Short Circuit Output Current: Buffered Totem-Pole Output | -30 | | -100 | mA | $V_{CC} = 5.25\text{ V}$, $I_F = 15\text{ mA}$ Output = GND |
| | Inverted Totem-Pole Output | -30 | | -100 | mA | $V_{CC} = 5.25\text{ V}$, $I_F = 0\text{ mA}$ Output = GND |
| t_r, t_f | Output Rise Time, Output Fall Time | | 70 | | ns | $V_{CC} = 5\text{ V}$, $T_A = 25^\circ\text{C}$ $I_F = 0$ or 15 mA $R_L = 8\text{ TTL Loads (Totem-Pole)}$ $R_L = 360\ \Omega$ (Open-Collector) |
| t_{PLH}, t_{PHL} | Propagation Delay Low-High & High-Low | | 5.0 | | μs | |

SLOTTED
OPTICAL
SWITCHES

Housing

All housings are an opaque grade of injection-molded plastic to minimize the assembly's sensitivity to ambient radiation, both visible and near-infrared. Discrete shells (exposed on the parallel faces inside the device throat) are either IR transmissive plastic for applications where aperture contamination may occur or opaque plastic for maximum protection against ambient light.

Optek reserves the right to make changes at any time in order to improve design and to supply the best product possible.
Optek Technology, Inc. 1215 W. Crosby Road Carrollton, Texas 75006 (972)323-2200 Fax (972)323-2396