

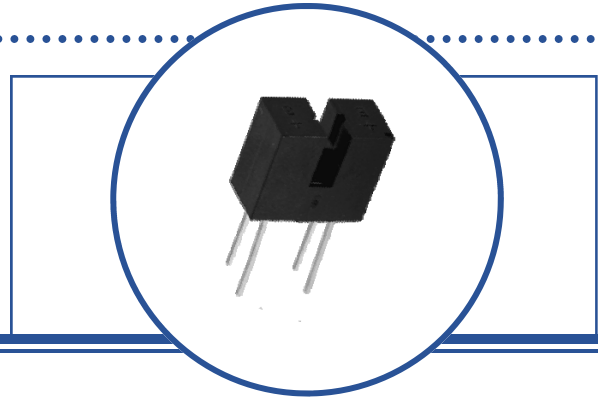
# Slotted Optical Switch

## OPB847, OPB848



### Features:

- Non-contact switching
- Apertured for high resolution
- Hermetically sealed components



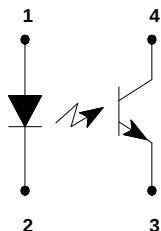
### Description:

The **OPB847** and **OPB848** consists of a gallium aluminum arsenide LED and a silicon phototransistor, which is soldered into a printed PCBoard and mounted in a high-temperature plastic housing on opposite sides of a 0.100 inch (2.540 mm) wide slot. Both device types have a .025 (0.635mm) inch by .060 inch (1.524 mm) aperture in front of the phototransistor for high resolution positioning sensing. Phototransistor switching takes place when an opaque object passes through the slot.

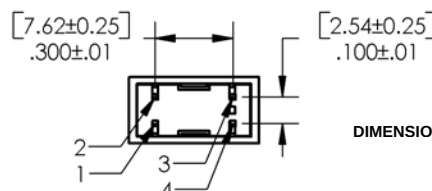
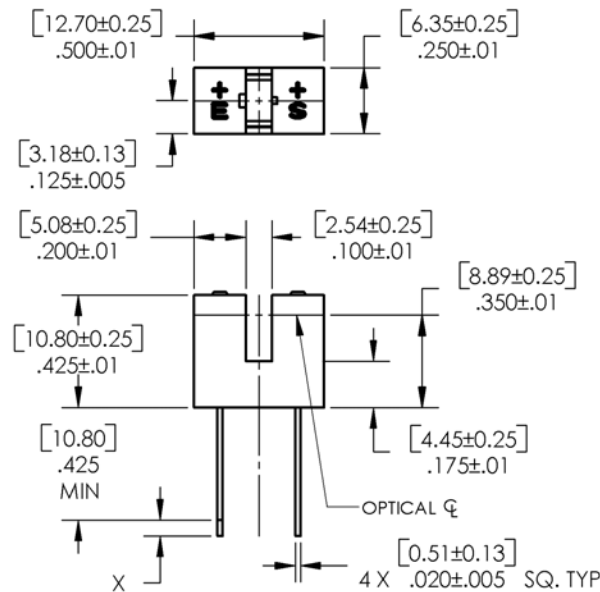
### Applications:

- Non-contact interruptive object sensing
- Assembly line automation
- Machine automation
- Equipment security
- Machine safety

| Part Number | LED Peak Wavelength | Sensor     | Slot Width / Depth | Aperture Emitter/Sensor | Lead Length / Spacing |
|-------------|---------------------|------------|--------------------|-------------------------|-----------------------|
| OPB847      | 890 nm              | Transistor | 0.100" / 0.250"    | 0.025" / 0.025"         | 0.425" / 0.300"       |
| OPB848      |                     |            |                    |                         |                       |



| Pin # | Description |
|-------|-------------|
| 1     | Anode       |
| 2     | Cathode     |
| 3     | Emitter     |
| 4     | Collector   |



DIMENSIONS ARE IN: [ MILLIMETERS ]  
INCHES



RoHS

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

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

|                                                                                             |                  |
|---------------------------------------------------------------------------------------------|------------------|
| Operating and Storage Temperature Range                                                     | -40° C to +85° C |
| Lead Soldering Temperature [1/16 inch (1.6mm) from the case for 5 sec. with soldering iron] | 240° C           |

**Input Diode**

|                                  |        |
|----------------------------------|--------|
| Forward DC Current               | 50 mA  |
| Reverse Voltage                  | 2.0 V  |
| Power Dissipation <sup>(2)</sup> | 100 mW |

**Output Phototransistor**

|                                  |        |
|----------------------------------|--------|
| Collector-Emitter Voltage        | 30 V   |
| Emitter-Collector Voltage        | 7 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 |
|--------|-----------|-----|-----|-----|-------|-----------------|
|--------|-----------|-----|-----|-----|-------|-----------------|

**Input Diode**

|       |                                |      |      |      |               |                                                 |
|-------|--------------------------------|------|------|------|---------------|-------------------------------------------------|
| $V_F$ | Forward Voltage <sup>(4)</sup> | 1.00 | 1.35 | 1.70 | V             | $I_F = 20 \text{ mA}$                           |
|       |                                | 1.20 | 1.55 | 1.90 |               | $I_F = 20 \text{ mA}, T_A = -55^\circ \text{C}$ |
|       |                                | 1.80 | 1.20 | 1.60 |               | $I_F = 20 \text{ mA}, T_A = 100^\circ \text{C}$ |
| $I_R$ | Reverse Current                | -    | 0.10 | 100  | $\mu\text{A}$ | $V_R = 2 \text{ V}$                             |

**Output Phototransistor**

|               |                                     |    |      |     |               |                                                            |
|---------------|-------------------------------------|----|------|-----|---------------|------------------------------------------------------------|
| $V_{(BR)CEO}$ | Collector-Emitter Breakdown Voltage | 30 | 110  | -   | V             | $I_C = 100 \mu\text{A}, I_F = 0$                           |
| $V_{(BR)ECO}$ | Emitter-Collector Breakdown Voltage | 5  | 10   | -   | V             | $I_E = 100 \mu\text{A}, I_F = 0$                           |
| $I_{CEO}$     | Collector-Emitter Dark Current      | -  | 0.20 | 100 | nA            | $V_{CE} = 10 \text{ V}, I_F = 0$                           |
|               |                                     | -  | 10   | 100 | $\mu\text{A}$ | $V_{CE} = 10 \text{ V}, I_F = 0, T_A = 100^\circ \text{C}$ |

**Notes:**

- (1) Duration can be extended to 10 seconds maximum when flow soldering.
- (2) Derate linearly 1.00 mW/° C above 25° C.
- (3) Methanol and isopropanol are recommended as cleaning agents.
- (4) Measurement is taken during the last 500  $\mu\text{s}$  of a single 1.0 ms test pulse. Heating due to increased pulse rate or pulse width can cause change in measurement results.

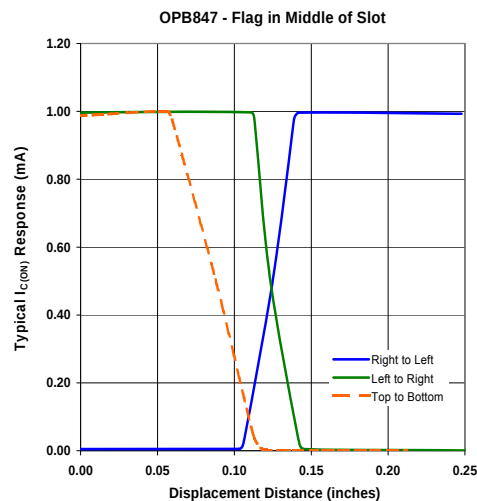
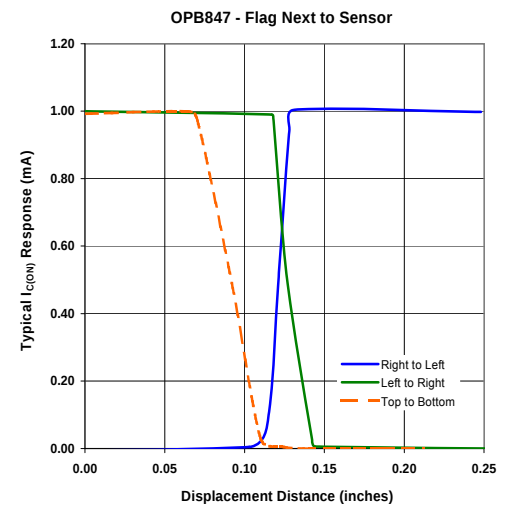
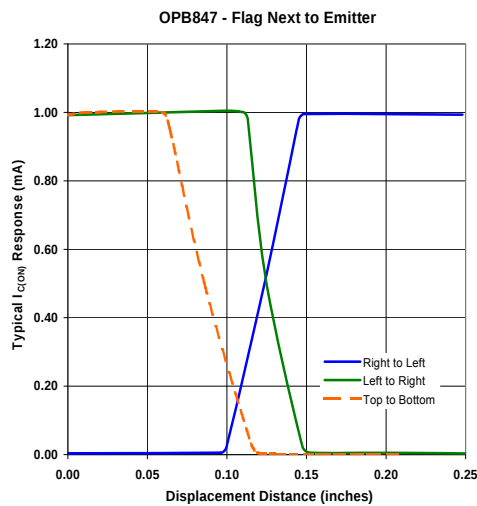
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### Electrical Characteristics ( $T_A = 25^\circ \text{C}$ unless otherwise noted)

| SYMBOL          | PARAMETER                                                     | MIN        | TYP          | MAX          | UNITS         | TEST CONDITIONS                                                                                    |
|-----------------|---------------------------------------------------------------|------------|--------------|--------------|---------------|----------------------------------------------------------------------------------------------------|
| <b>Combined</b> |                                                               |            |              |              |               |                                                                                                    |
| $I_{C(ON)}$     | On-State Collector Current <sup>(1)</sup><br>OPB847<br>OPB848 | 4.0<br>1.0 | -<br>-       | -<br>-       | mA            | $V_{CE} = 10 \text{ V}$ , $I_F = 20 \text{ mA}$<br>$V_{CE} = 10 \text{ V}$ , $I_F = 20 \text{ mA}$ |
| $V_{CE(SAT)}$   | Collector-Emitter Saturation Voltage<br>OPB847<br>OPB848      |            | 0.30<br>0.30 | 0.40<br>0.40 | V             | $I_C = 2 \text{ mA}$ , $I_F = 20 \text{ mA}$<br>$I_C = 500 \mu\text{A}$ , $I_F = 20 \text{ mA}$    |
| $t_r$           | Output Rise Time<br>OPB847<br>OPB848                          |            | 12<br>8      | 20<br>15     | $\mu\text{s}$ | $V_{CC} = 10 \text{ V}$ , $I_F = 20 \text{ mA}$ , $R_L = 1000\Omega$                               |
| $t_f$           | Output Fall Time<br>OPB847<br>OPB848                          |            | 12<br>8      | 20<br>15     |               |                                                                                                    |

#### Notes:

- (1) Measurement is taken during the last 500  $\mu\text{s}$  of a single 1.0 ms test pulse. Heating due to increased pulse rate or pulse width can cause change in measurement results.



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