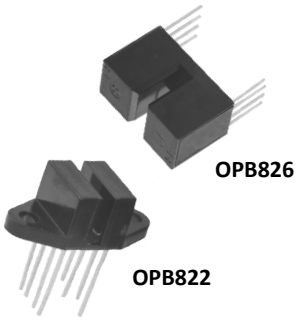
# Dual Channel Encoder

## OPB822S, OPB822SD

## OPB826S, OPB826SD

### Features:

- Non-contact switching
- Single or double apertures for high resolution
- Choice of slot widths
- Choice of side-by-side or over/under dual channels
- Choice of electrical outputs




### Description:

Each **OPB822** and **OPB826** slotted switch consists of two infrared emitting diodes and two NPN silicon phototransistors mounted on opposite sides of a 0.090" (2.29 mm) wide slot **(OPB822)** or a 0.100" (2.54 mm) wide slot **(OPB826)**.

**OPB822** uses an side-by-side mounting configuration, while **OPB826** uses an over/under mounting configuration. **OPB822S** has 0.01" by 0.04" (0.25 mm x 1.02 mm) apertures in front of both phototransistors while the **OPB822SD** has the aperture in front of both phototransistors and both emitters. The **OPB826S** has 0.04" by 0.04" (1.02 mm x 1.02 mm) apertures in front of both phototransistors while the **OPB826SD** has the aperture in front of both phototransistors and both emitters.

Dual channels enable direction of travel sensing, with the low-cost plastic housing reduces possible interference from ambient light and provides protection from dust and dirt.

Phototransistor switching occurs when an opaque object passes through the device slot.

For information on encoder design, see Application Bulletin 203 at:

Custom electrical, wire and cabling and connectors are available. Contact your local representative or OPTEK for more information.

### Applications:

- Encoders
- Non-contact 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 |
|---|---|---|---|---|---|
| **OPB822S** | Dual 935 nm | Dual Transistor | 0.09" / 0.30" | None / 0.01" | 0.35" / 0.30" |
| **OPB822SD** | | | | 0.01" / 0.01" | |
| **OPB826S** | Dual 890 nm | Dual Transistor | 0.10" / 0.42" | NA / 0.04" | 0.20" / 0.74" |
| **OPB826SD** | | | | 0.04" / 0.04" | |

RoHS

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 | OPTEK Technology
2900 E. Plano Pkwy, Plano, TX 75074 | Ph: +1 972 323 2200
www.ttelectronics.com | sensors@ttelectronics.com

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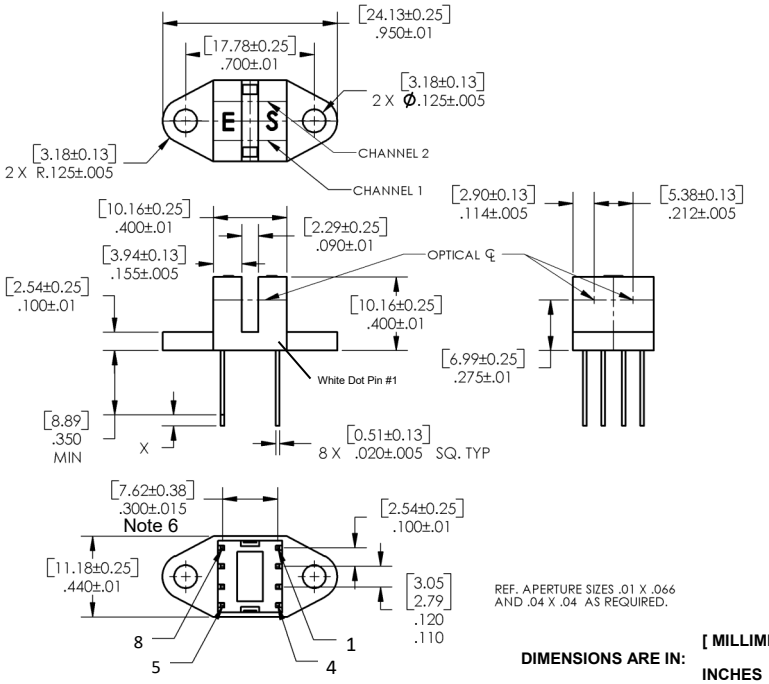
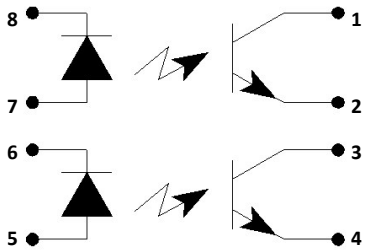
## OPB822S, OPB822SD

## OPB826S, OPB826SD

### OPB822




**Bottom View**

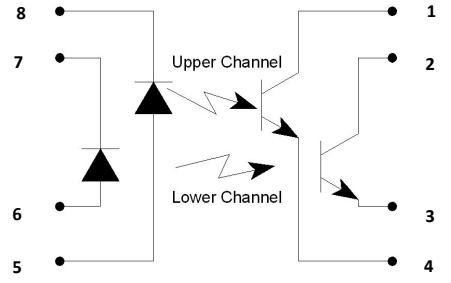



| Pin # | Description | Pin # | Description |
|---|---|---|---|
| 8 | Cathode-1 | 1 | Collector-1 |
| 7 | Anode-1 | 2 | Emitter-1 |
| 6 | Cathode-2 | 3 | Collector-2 |
| 5 | Anode-2 | 4 | Emitter-2 |

**DIMENSIONS ARE IN:** **[ MILLIMETERS]**
**INCHES**

### OPB826

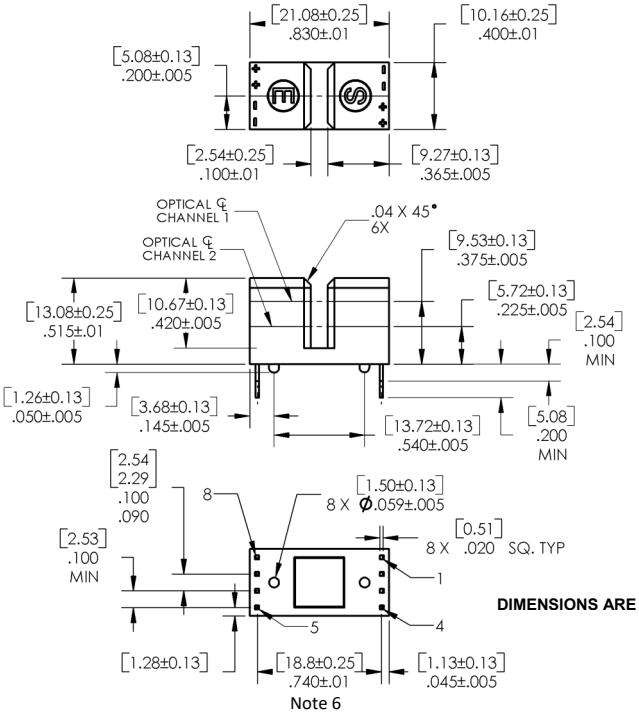
**Bottom View**




| Pin # | Description | Pin # | Description |
|---|---|---|---|
| 8 | Cathode-1 | 1 | Collector-1 |
| 7 | Cathode-2 | 2 | Collector-2 |
| 6 | Anode-2 | 3 | Emitter-2 |
| 5 | Anode-1 | 4 | Emitter-1 |

**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.

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**INCHES**



TT Electronics | OPTEK Technology
2900 E. Plano Pkwy, Plano, TX 75074 | Ph: +1 972 323 2200
www.ttelectronics.com | sensors@ttelectronics.com

## Absolute Maximum Ratings ($T_A$ = 25° C unless otherwise noted)

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

**Input Diode**

| | |
|---|---|
| Forward DC Current<br>OPB822S, OPB822SD<br>OPB826S, OPB826SD | <br>50 mA<br>40 mA |
| Peak Forward Current (1 µs pulse width, 300 pps) | 1 A |
| Reverse DC Voltage | 2 V |
| Power Dissipation[2] | 100 mW |

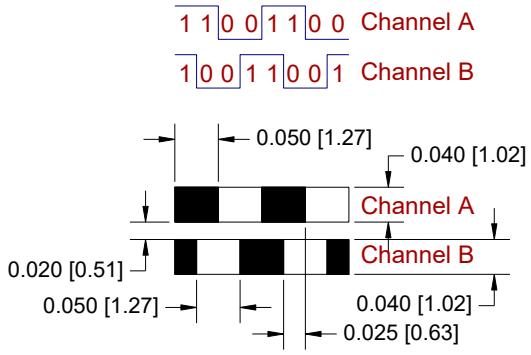
**Output Phototransistor**

| | |
|---|---|
| Collector-Emitter Voltage | 30 V |
| Emitter-Collector Voltage | 5 V |
| Collector DC Current | 30 mA |
| Power Dissipation[2] | 100 mW |

Notes:

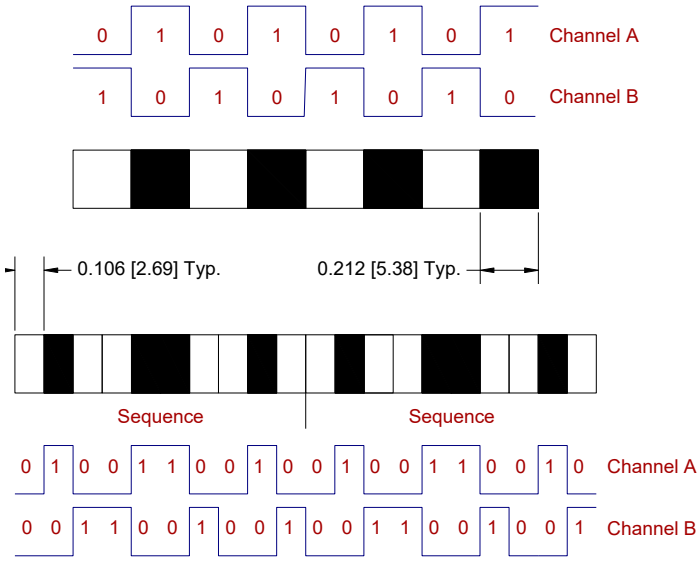
(1) RMA flux is recommended. Duration can be extended to 10 seconds maximum when flow soldering.
(2) Derate linearly 1.67 mW/°C above 25° C.
(3) Methanol or isopropanol are recommended as cleaning agents. Plastic housing is soluble in chlorinated hydrocarbons and ketones. Spray and wipe; do not submerge.
(4) Derate linearly 3.33 mW/°C above 25° C.
(5) All parameters tested using pulse techniques.
(6) Feature controlled at body.

### Encoder Sequence for OPB826




For information on encoder design,
see Application Bulletin 203 at:
http://www.optekinc.com/pdf/App_Note_203.pdf

### Encoder Sequence for OPB822



## Electrical Characteristics (OPB822, OPB826) ($T_A$ = 25°C unless otherwise noted)

| SYMBOL | PARAMETER | MIN | TYP | MAX | UNITS | TEST CONDITIONS |
|---|---|---|---|---|---|---|
| **Input Diode** (see OP14O for OPB822 or OP266 for OPB826 for additional information) | | | | | | |
| $V_F$ | Forward Voltage | - | - | 1.7 | V | $I_F$ = 20 mA |
| $I_R$ | Reverse Current | - | - | 100 | µA | $V_R$ = 2 V |
| **Output Phototransistor** (see OP550 for OPB822 or OP506 for OPB826 for additional information) | | | | | | |
| $V_{(BR)(CEO)}$ | Collector-Emitter Breakdown Voltage | 30 | - | - | V | $I_C$ = 1 mA |
| $V_{(BR)(ECO)}$ | Emitter-Collector Breakdown Voltage | 5 | - | - | V | $I_E$ = 100 µA |
| $I_{CEO}$ | Collector-Emitter Leakage Current | - | - | 100 | nA | $V_{CE}$ = 10 V, $I_F$ = 0, $E_E$ = 0 |
| **Coupled** | | | | | | |
| $I_{C(ON)}$ | On-State Collector Current | | | | | |
| | OPB822S | 250 | - | - | µA | $V_{CE}$ = 5 V, $I_F$ = 20 mA |
| | OPB822SD | 100 | - | - | µA | $V_{CE}$ = 5 V, $I_F$ = 20 mA |
| | OPB826S | 250 | - | - | µA | $V_{CE}$ = 10 V, $I_F$ = 20 mA |
| | OPB826SD | 100 | - | - | µA | $V_{CE}$ = 10 V, $I_F$ = 20 mA |
| $V_{CE(SAT)}$ | Collector-Emitter Saturation Voltage | | | | | |
| | OPB822S | - | - | 0.4 | V | $I_C$ = 125 µA, $I_F$ = 20 mA |
| | OPB822SD | - | - | 0.4 | V | $I_C$ = 50 µA, $I_F$ = 20 mA |
| | OPB826S | - | - | 0.4 | V | $I_C$ = 125 µA, $I_F$ = 20 mA |
| | OPB826SD | - | - | 0.4 | V | $I_C$ = 50 µA, $I_F$ = 20 mA |
| $I_{CX1}$ | Crosstalk | | | | | |
| | OPB822D, OPB822SD | - | - | 250 | µA | $I_{F1}$ = 0 mA, $I_{F2}$ = 20 mA, $V_{CE}$ = 10 V |
| | OPB826S | - | - | 20 | | |
| | OPB826SD | - | - | 10 | | |

Notes:

(1) All parameters tested using pulse techniques.