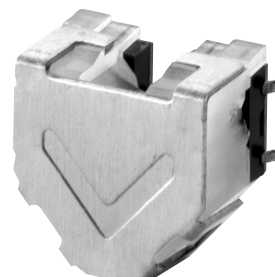


# Micro Tilt Sensor D6B

## Surface Mounting Tilt Sensor Fits Space-Confined Installations

- Detect tilting over a range of 45 to 75 degrees in right-and-left inclination
- Gull wing surface mount terminals
- Wide operating temperature range: -10° to 60°C
- Ideal for PDAs, cell phones and test equipment; digital cameras and video cameras to change aspect ratio automatically; also replaces mercury switches in portable space heaters and game machines such as pinball games
- RoHS Compliant



## Ordering Information

| Operation angle | Return angle | Output rating | Operating voltage | Model     |
|-----------------|--------------|---------------|-------------------|-----------|
| 45° to 75°      | 50° to 20°   | 0.5 VDC       | 2.7 to 3.3 VDC    | D6B-2 (P) |

## Specifications

### ■ Absolute Maximum Ratings

|                                   |                                             |
|-----------------------------------|---------------------------------------------|
| Supply voltage range ( $V_{dd}$ ) | -0.1 to 5.0 VDC                             |
| Output current ( $I_{out}$ )      | ±1 mA                                       |
| Operating temperature range       | -10° to 60°C with no icing                  |
| Storage temperature range         | -25° to 70°C                                |
| Operating/storage humidity range  | 25% to 85% RH with no icing or condensation |

### ■ Electrical Characteristics

|                            |                                                      |
|----------------------------|------------------------------------------------------|
| Power supply voltage range | 2.7 to 3.3 VDC                                       |
| Output high voltage        | $V_{dd} - 0.5$ V min.                                |
| Output low voltage         | 0.5 V max.                                           |
| Current consumption        | 20 $\mu$ A max.; 10 $\mu$ A typical ( $V_{dd} = 3$ ) |

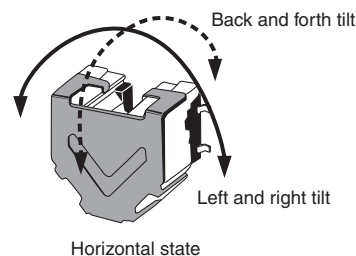
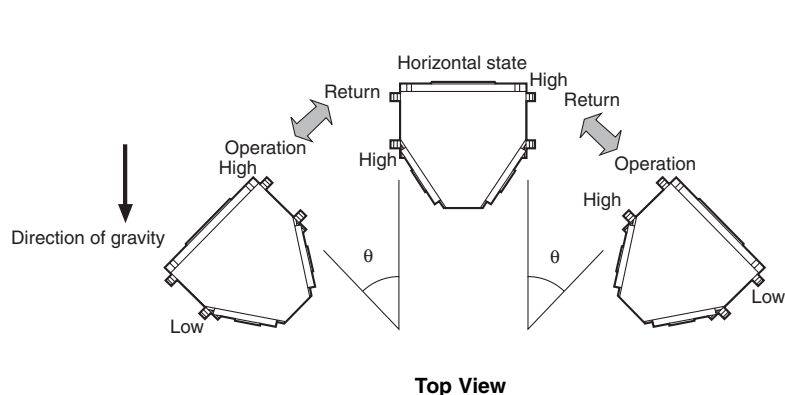
**Note:** Measured under standard conditions of ambient temperature  $\approx$  5°C to 35°C.

### ■ Performance

Refer to the drawing on the following page for an operational diagram showing operation and return angles.

|                            |                                                                                                |
|----------------------------|------------------------------------------------------------------------------------------------|
| Operation angle            | 45° to 75° (when output goes from High to Low)                                                 |
| Return angle               | 50° to 20° (when output goes from Low to High)                                                 |
| Vibration resistance       | Malfunction: 10-55-10 Hz 1.5 mm single amplitude (3.0 mm double amplitude) for 2 hours, 3-Axis |
| Shock resistance           | Malfunction: 735 m/s <sup>2</sup> (approx. 75G)                                                |
| Electrical life expectancy | 100,000 operations min. (15-20 operations/minute)                                              |

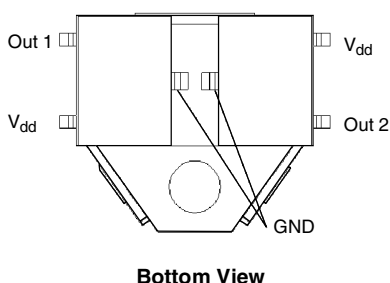
# Operation



- Note:**
1. Operation angle: Output goes from High to Low
  2. Return angle: Output goes from Low to High
  3. Characteristic values are provided on condition that there is no tilt back and forth while the operation speed is 10° per second.

# Installation

## Terminal Arrangement



## Solder Conditions

### Reflow (Infrared) Soldering Conditions\*

Weld a thermocouple on the terminal side of the Sensor with HMP (high melting point) solder, place the Sensor into the reflow oven and set the reflow oven so that the peak terminal temperature will be  $230^{\circ}\text{C} \pm 5^{\circ}\text{C}$ . Complete soldering within 20 seconds.

The peak terminal temperature must not exceed  $240^{\circ}\text{C}$ .

### Desoldering Conditions with Blower Employed

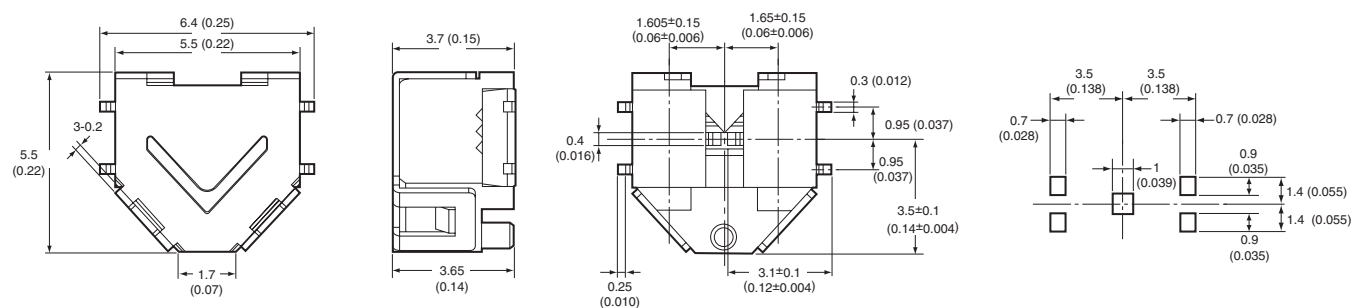
Desolder the Sensor at a temperature of  $240^{\circ}\text{C}$  within five seconds.

If a soldering iron is applied manually, desolder the Sensor within 10 seconds at an iron tip temperature of  $260^{\circ}\text{C}$  or within three seconds at an iron tip temperature of  $350^{\circ}\text{C}$ .

\* Preheat temperature =  $140^{\circ}\text{C}$  max. for  $90 \pm 30$  seconds.

# Dimensions

Unit: mm (inch)



## Precautions

- The Sensor does not use any materials detrimental to the ozone layer.
- Specifications other than the electrical or mechanical characteristics, external dimensions, or mounting dimensions of the Sensor are subject to change without notice.

## ■ Handling Precautions

### Operating Environment

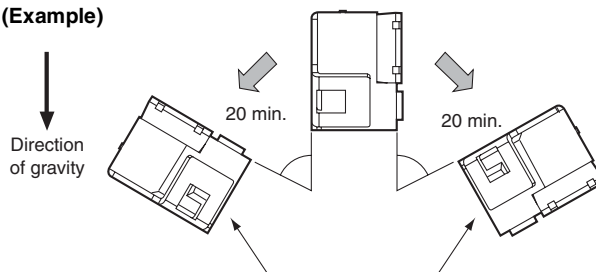
- The Sensor consists of a Hall IC and a magnet. Check that the Sensor in operation will not be influenced by any external magnetic fields.
- Do not install any magnetic materials within 2 mm of the Sensor, else the performance characteristics of the Sensor may not be guaranteeable. If there are any objects (e.g., motors and solenoids) generating magnetic fields near the Sensor, operate and test the Sensor before the Sensor comes into actual use.
- Do not apply any voltage exceeding 5V to the Sensor, else the Sensor may break.
- Do not wash the Sensor after the Sensor is soldered.
- Do not mount or dismount the Sensor while power is flowing to the Sensor.
- The Sensor may generate error signals if impacted at a minimum acceleration of 294 m/s<sup>2</sup>.

- The Sensor may generate error signals if a vibration at a minimum frequency of 15 Hz and a minimum acceleration of 15m/s<sup>2</sup> is applied to the Sensor.
- Confirm that no static electricity at a maximum voltage of 5kV is applied to the pins, else the Sensor may break.

## Operating Characteristics

The present output may stay unchanged if the inclination of the Sensor back and forth is 20° or more. Under that condition, the output might not change even when the Sensor is leaned left or right.

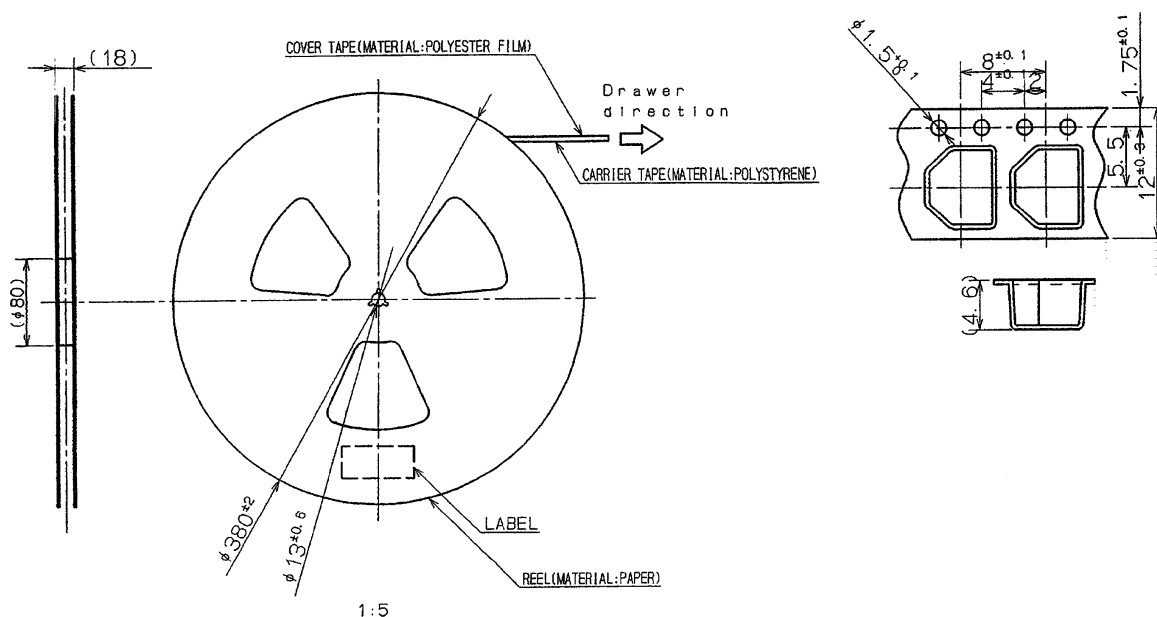
(Example)



If the Sensor is kept inclined back or forth as shown in the above illustration, the level of output might not change from high to low or low to high when the Sensor inclines left or right.

## Tape Packing

### ■ Reel Dimensions



**Note:** 1. This packing conforms to standard of EIAJ.

2. Quantity per reel: 2,000 pieces.

3. Each reel is packaged within a sealed bag to protect the sensor from the effects of moisture and humidity. In order to maintain optimal solderability and performance, after the bag's seal is broken, ensure that storage conditions do not exceed 30°C, 80% RH and that reflow soldering/assembly occurs within two months.

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