# Micro Tilt Sensor
D6BN

Surface Mounting Tilt Sensor Fits Space-Confined Installations

- Low profile 2mm with Gull wing surface mount terminals
- Detect tilting over a range of 40 to 80 degrees in right-and-left inclination
- 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
- Replaces mercury switches in portable space heaters and gaming machines, such as pinball games, and slot machines
- RoHS Compliant
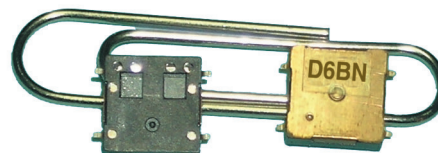
Ordering Information

Operation angle	Return angle	Output rating	Operating voltage	Model
40° to 80°	50° to 10°	0.4 VDC	2.4 to 3.6 VDC	**D6BN-1P**

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

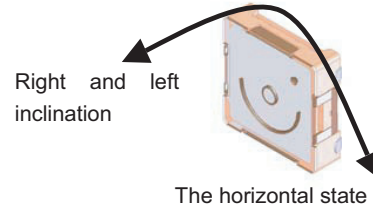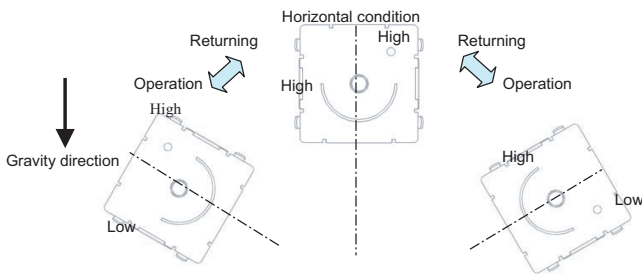|	
Power supply voltage range	2.4 to 3.6 VDC
Output high voltage	V_{dd} – 0.4 V min.
Output low voltage	0.4 V max.
Current consumption	10 μA max.; 10 μA typical (V_{dd} = 3)

Note: Measured under standard conditions of ambient temperature ≈ 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	40° to 80° (when output goes from High to Low)
Return angle	50° to 10° (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^2 (approx. 75G)
Electrical life expectancy	100,000 operations min. (15-20 operations/minute)

Operation

Horizontal condition

Returning / Operation / High / Gravity direction / Low / High / High / High / Low / Returning / Operation
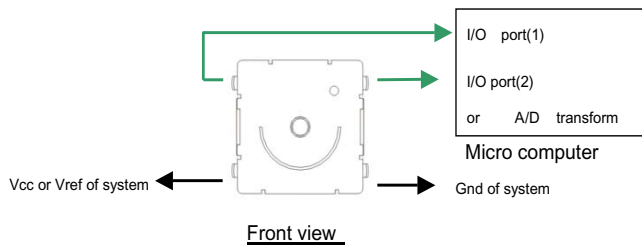
Right and left inclination

The horizontal state

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

I/O   port(1)

I/O port(2)

or   A/D   transform

Micro computer

Vcc or Vref of system

Gnd of system

Front view

■ Solder Conditions

In the case of Sn-Pb eutectic solder

Temperature [°C]		Time[s]
Preheat area	140	90±30
Reflow area	230±5	≤ 20
Peak temperature	max. 240	≤ 5

In the case of Pb-free solder

Temperature [°C]		Time[s]
Preheat area	160 ~ 180	90±30
Reflow area	230±5	≤ 40
Peak temperature	max. 250	≤ 10

Reflow times: 2 times max.

Desoldering Conditions with Blower Employed

Desolder the Sensor at a temperature of 240°C within five seconds.

If a soldering iron is applied manually, desolder the Sensor within 10 seconds at an iron tip temperature of 260°C or within three seconds at an iron tip temperature of 350°C.

Dimensions

MAX7.6

7 ±0.2

7 ±0.2

MAX2

(5.9)

(0.63)

A

4.6 ±0.1

4-SOLDER SIDE

DETAIL A

① VOUT1
② VDD
③ VSS
④ VOUT2

1.2 1.4 4.1 4.1 1.4
2.9
2.9
1.2

RECOMMENDATION SOLDERING PATTERN
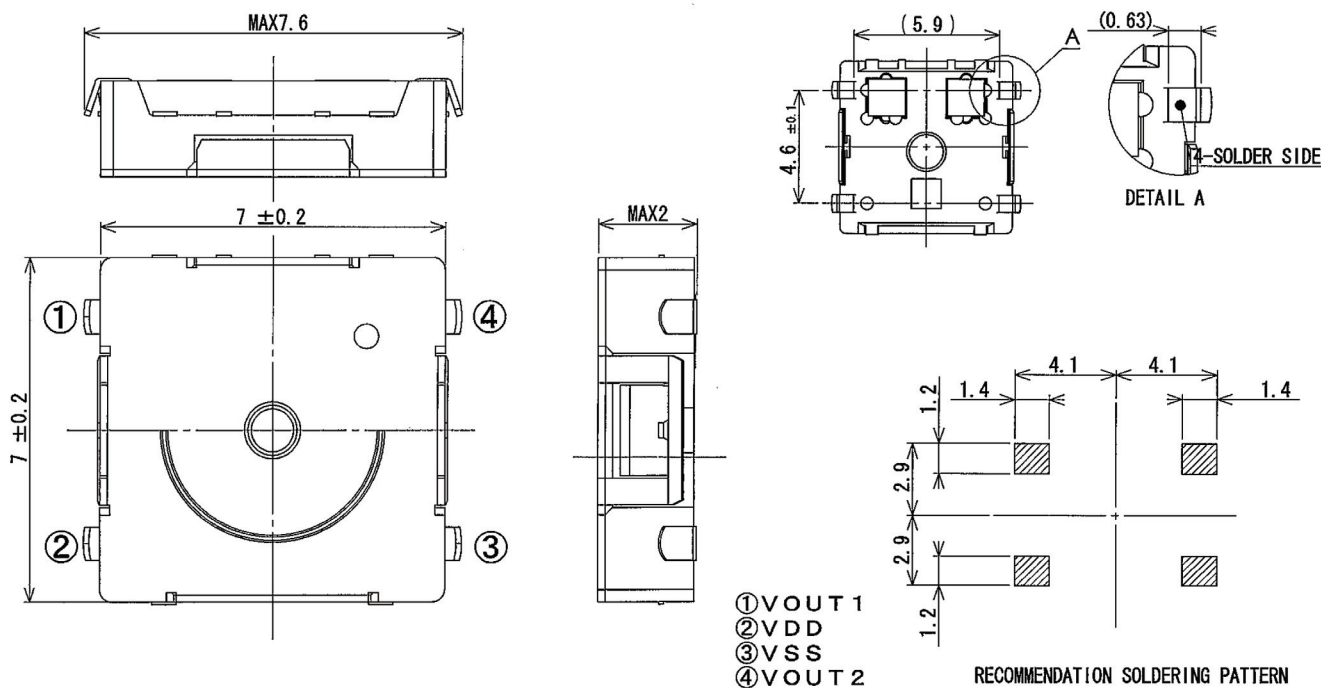
Precautions

- 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.
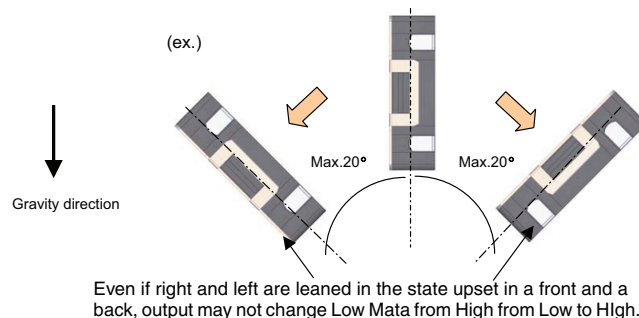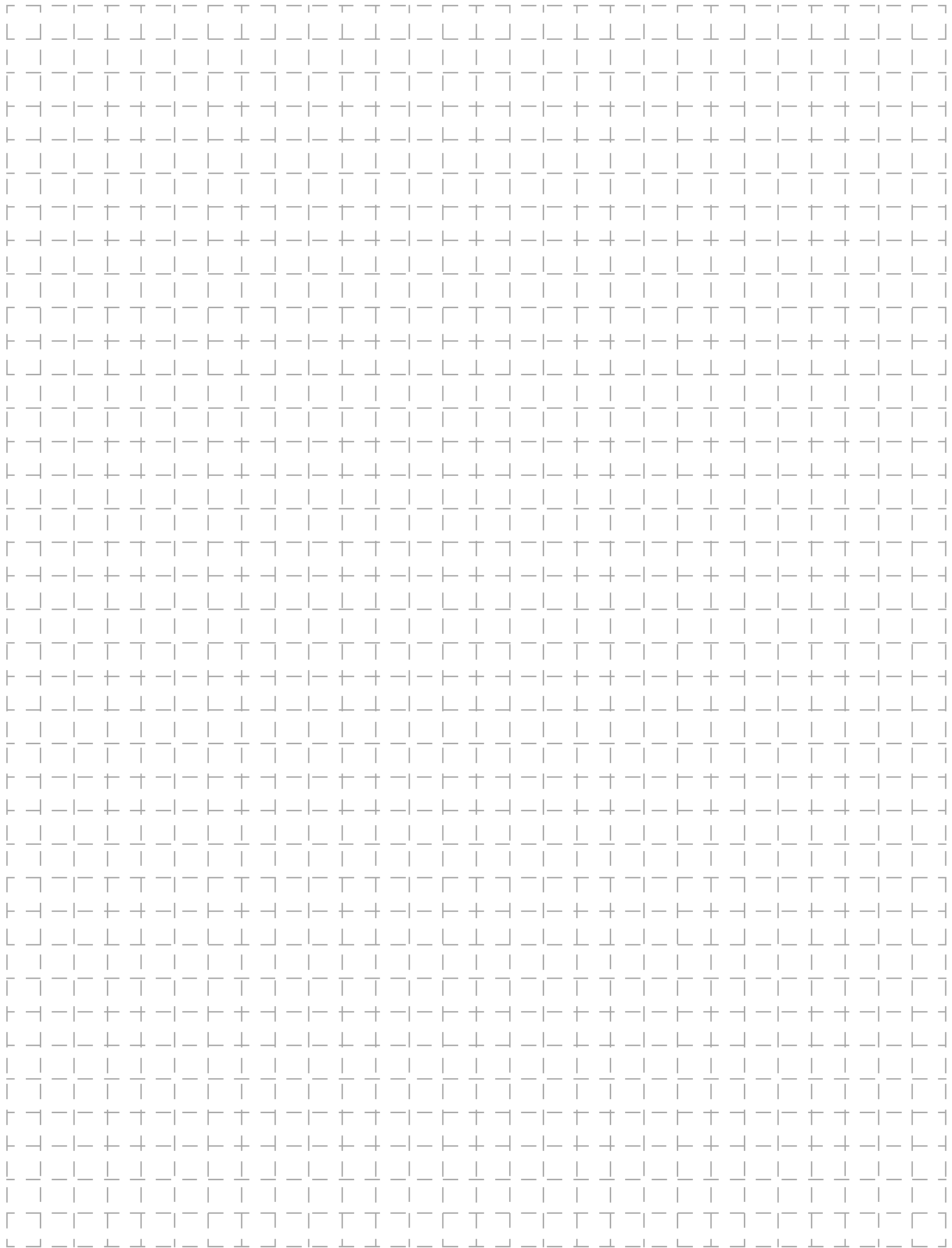
■ Handling Precautions

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 IC may be damaged.
- Do not wash the Sensor after the Sensor is soldered.
- Do not mount or dismount the Sensor while power if flowing to the Sensor.
- The Sensor may generate error signals if impacted at a minimum acceleration of 294 m/s^2.
- The Sensor may generate error signals if a vibration at a minimum frequency of 15 Hz and a minimum acceleration of 15m/s^2 is applied to the Sensor.
- Confirm that no static electricity at a maximum voltage of 5kV is applied to the pins, else the IC may be damaged.

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.

(ex.)

Gravity direction

Max.20°   Max.20°

Even if right and left are leaned in the state upset in a front and a back, output may not change Low Mata from High from Low to HIgh.

Tape Packing

■ Reel Dimensions

COVER TAPE (MATERIAL : POLYESTER FILM)
CARRIER TAPE (MATERIAL : POLYSTYRENE)
REEL (MATERIAL : PAPER)

(22)

ø80

ø13 ±0.5

ø380 ±1

REEL DETAIL DRAWING (1:5)

ø1.5 +0.1 0

12 ±0.1

2
4 ±0.1

C

C

1.75 ±0.1
7.5 ±0.1

16 ±0.2

MAX3°

(2.2)

2-MAXR0.2

7.9 ±0.1

C–C

LABEL (Note 3)

Note: 1. This Packing conforms EIAJ standard.
    2. This Packing packs up D6BN-☐ 2,500 pieces.
    3. Expression of label as follows;
      • TYPE NAME
      • LOT No.
      • NAME OF A COMPANY
      • THE COUNTRY OF ORIGIN

ALL DIMENSIONS SHOWN ARE IN MILLIMETERS.
To convert millimeters into inches, multiply by 0.03937. To convert grams into ounces, multiply by 0.03527.

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