

## PS25405 EPIC sensor, non-contact, low gain

### Datasheet

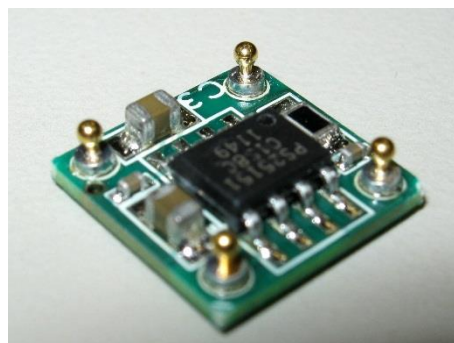
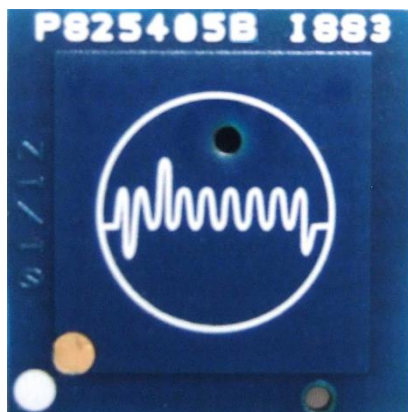


Fig. 1 The PS25405B Sensor

Plessey Semiconductors Electric Potential Integrated Circuit (EPIC) product line targets a range of applications.

The PS25405B is an ultra high impedance non-contact solid state electric potential sensor. It can be used to detect field disturbance due to the movement of a near-by object. This functionality can be employed in a range of applications including security motion sensors and non-contact electric switches for lighting, door opening, toys etc

The device uses active feedback techniques to both lower the effective input capacitance of the sensing element ( $C_{in}$ ) and boost the input resistance ( $R_{in}$ ). These techniques are used to realise a sensor with a frequency response suitable for remote sensing applications.

#### FEATURES

- Ultra high effective input resistance, typically  $20G\Omega$ .
- Effective input capacitance as low as  $15pF$ .
- Upper 3dB point typically  $20kHz$ .
- Operates with bipolar power supply from  $\pm 2.4V$  to  $\pm 5.5V$ .
- Sensors supplied in a custom package with exposed pins for surface mount assembly.

#### APPLICATIONS

- Proximity switching of lighting and similar electric circuits

- Remote control of TVs and other domestic appliances
- Presence detection for security / alarm systems
- Room occupancy detection for rescue services
- Simple gesture recognition to control children's toys
- Controller-less computer gaming systems

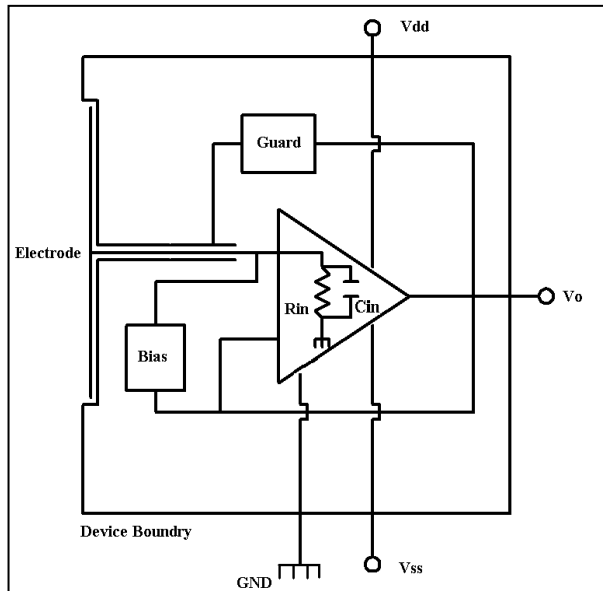


Fig. 2 Internal circuit of EPIC Movement Sensor

## ELECTRICAL CHARACTERISTICS

$T_{amb} = -25^{\circ}\text{C}$  to  $+75^{\circ}\text{C}$ ,  $V_{dd}/V_{ss} \pm 2.4\text{V}$  to  $\pm 5.5\text{V}$ . The electrical characteristics are guaranteed by either production test or by design and characterisation. They apply within the specified ambient temperature and supply voltage unless otherwise stated.

| Characteristics             | Value     |      |           | Units      | Conditions                                                                                                                                                                                           |
|-----------------------------|-----------|------|-----------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                             | Min.      | Typ. | Max.      |            |                                                                                                                                                                                                      |
| Supply voltage              | $\pm 2.4$ |      | $\pm 5.5$ | V          | Bipolar supply, Gnd=0V<br><br>As measured at the sensor electrode<br><br>When measured with 250pF coupling capacitance<br><br>Set by internal DC signal rejection network – coupling capacitor 250pF |
| Supply current              | 1.5       | 2.5  | 3.5       | mA         |                                                                                                                                                                                                      |
| Effective input resistance  |           | 20   |           | G $\Omega$ |                                                                                                                                                                                                      |
| Effective input capacitance |           | 15   |           | pF         |                                                                                                                                                                                                      |
| Voltage Gain ( $A_v$ )      |           | 10   |           |            |                                                                                                                                                                                                      |
| Lower -3dB point            |           | 30   |           | Hz         |                                                                                                                                                                                                      |
| Upper -3dB point            |           | 20.0 |           | kHz        |                                                                                                                                                                                                      |
| Noise                       |           | tbd  |           |            |                                                                                                                                                                                                      |

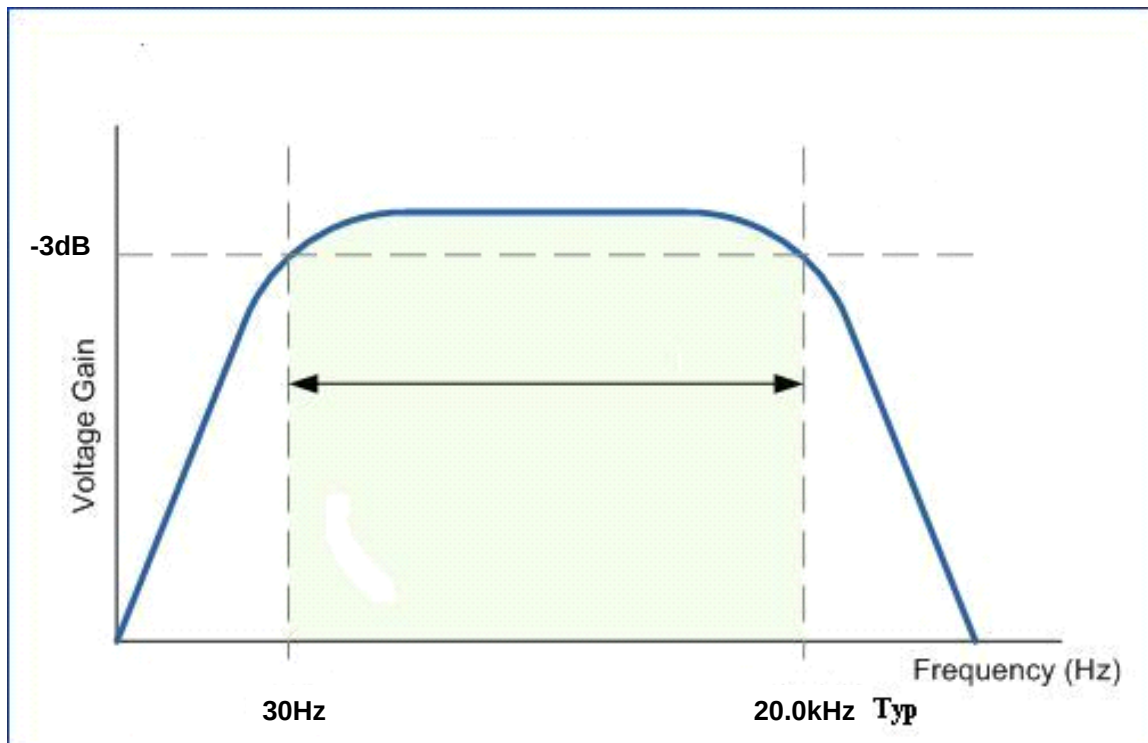


Fig. 3 Typical Bode Plot for PS25405B Sensor with Coupling through 250pF Capacitor

## PIN ASSIGNMENT

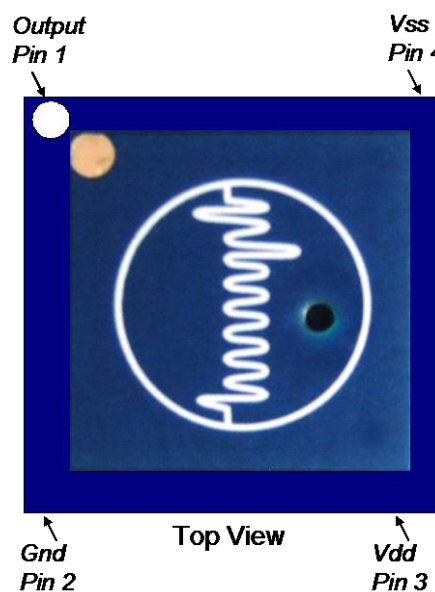


Fig. 4 Pin Assignment for the PS25405B – Top View

## MECHANICAL DIMENSIONS

The package diagram is shown below. It is recommended that a solder pad 1.6mm diameter be defined for the mounting of the sensor pins.

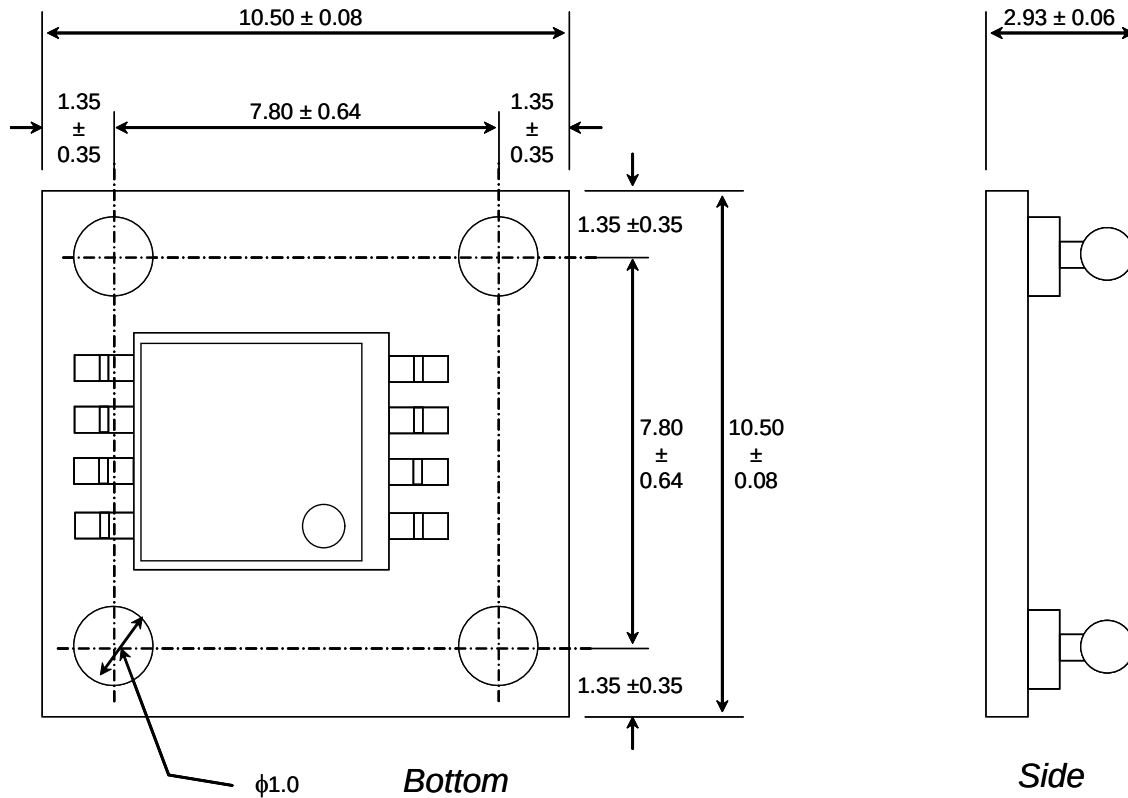


Fig. 5 Mechanical Drawing (all dimensions are nominal and in mm)

## ELECTROSTATIC DISCHARGE (ESD) PROTECTION

The PS25405B is manufactured using a high performance analog CMOS process. As for all CMOS components, it is essential that conventional ESD protection protocols be applied for the handling of this device.

## PATENTS

This component and many of the associated applications are covered by the following international patents:

|                      |               |
|----------------------|---------------|
| 602 32 911.6-08 (DE) | EP2174416     |
| AU2007228660         | GB1118970.1   |
| CA2646411            | JP2009-500908 |
| CN200780026584.8     | JP4391823     |
| EP1451595 (CH)       | TW097126903   |
| EP1451595 (ES)       | TW1308066     |
| EP1451595 (FR)       | US12/293872   |
| EP1451595 (IE)       | US12/374359   |
| EP1451595 (IT)       | US12/669615   |
| EP1451595 (NL)       | US13/020890   |
| EP2002273            | US13/163988   |
| EP2047284            | US7885700     |

### Customer Enquiries/Sales

+44 1752 693000 | [sales@plesseysemi.com](mailto:sales@plesseysemi.com)

[www.plesseysemi.com](http://www.plesseysemi.com)

Plessey Semiconductors Ltd | Plymouth

Tamerton Road, Roborough

Plymouth, Devon

PL6 7BQ

United Kingdom

P: +44 1752 693000

F: +44 1752 693700

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Тел: +7 (812) 336 43 04 (многоканальный)

Email: [org@lifeelectronics.ru](mailto:org@lifeelectronics.ru)

[www.lifeelectronics.ru](http://www.lifeelectronics.ru)