

## PS25451 EPIC QFN sensor, non-contact, high gain Datasheet

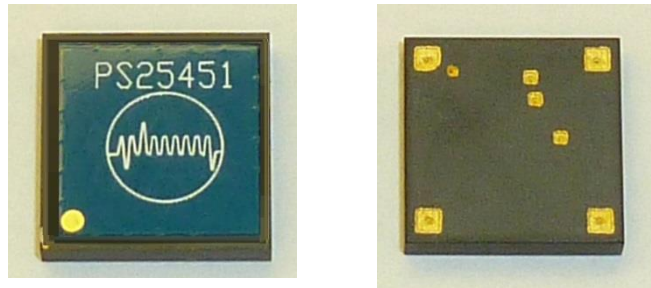


Fig. 1 The PS25451 Sensor Top and Bottom

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

The PS25451 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  $10kHz$ .
- 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

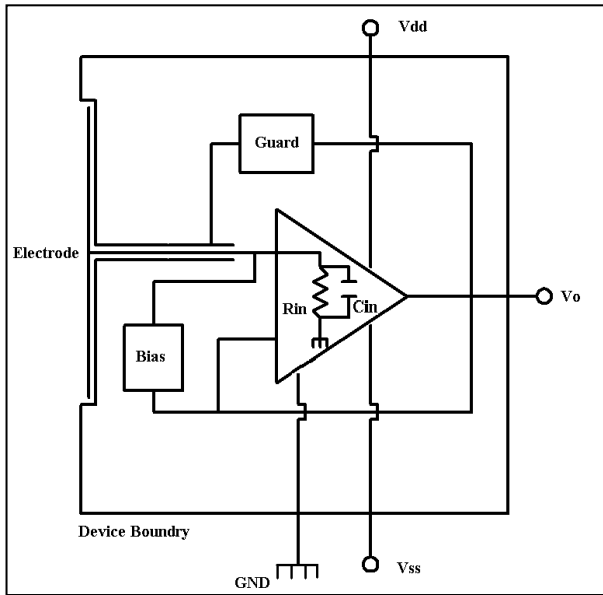


Fig. 2 Internal circuit of EPIC Movement Sensor

## 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   |
| Supply current                   | 0.6       | 2.0  | 3.5       | mA         |  |
| Effective input resistance       |           | 20   |           | G $\Omega$ |  |
| Effective input capacitance      |           | 15   |           | pF         | As measured at the sensor electrode                                    |
| Primary Output Voltage Gain (Av) | 47.5      | 50   | 52.5      |            | When measured with 250pF coupling capacitance.                         |
| Guard Output voltage gain        | 0.95      | 1.0  | 1.05      |            | @1kHz  |
| Lower -3dB point                 |           | 0.20 |           | Hz         | Set by internal DC signal rejection network – coupling capacitor 250pF |
| Upper -3dB point                 | 4.0       |      |           | kHz        |  |

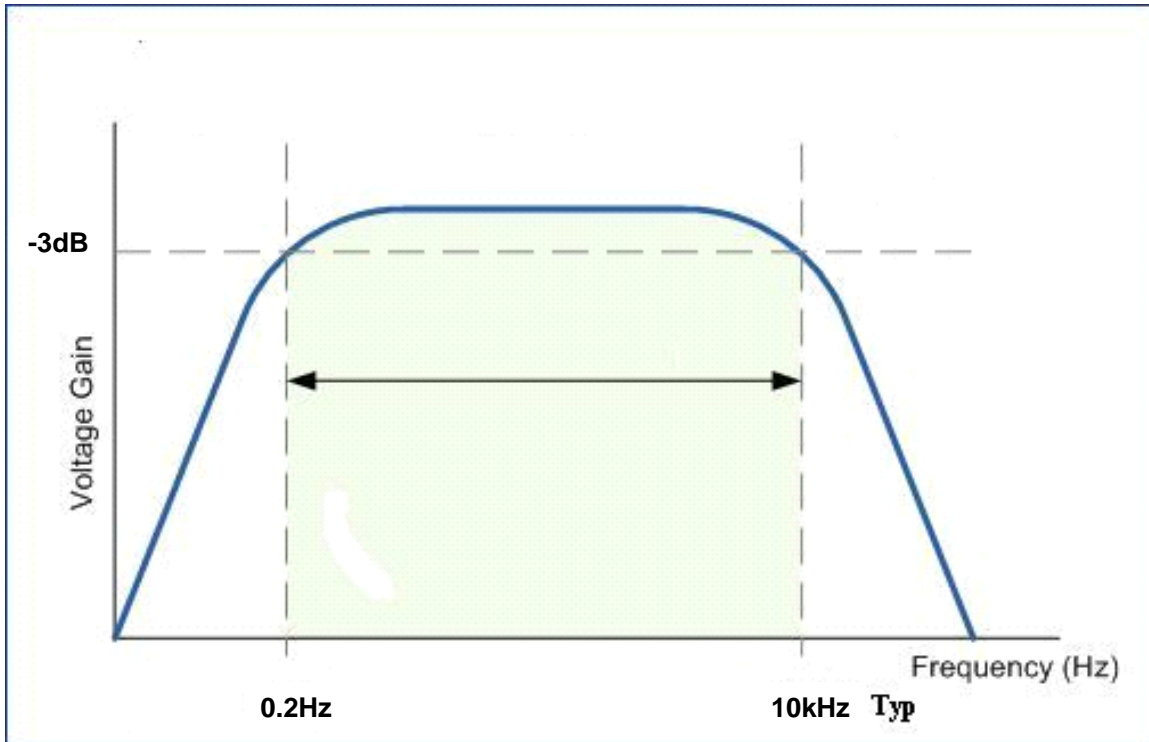


Fig. 3 Typical Bode Plot for PS25451 Sensor with Coupling through 250pF Capacitor

### PIN ASSIGNMENT

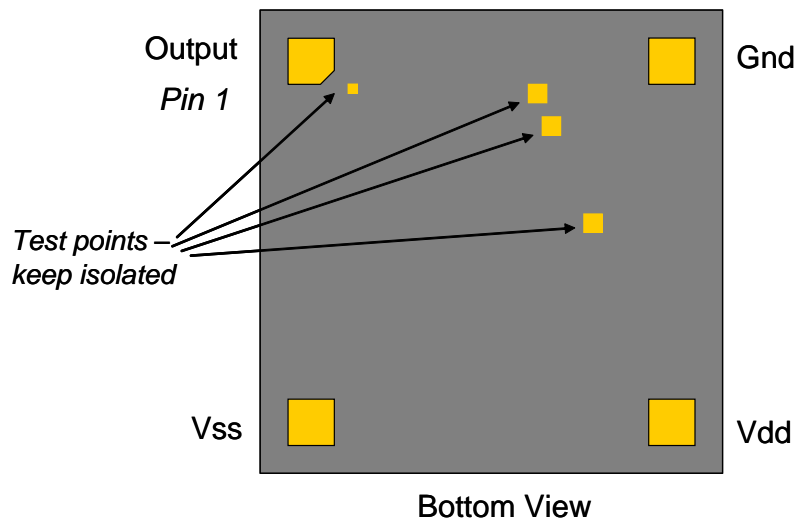


Fig. 4 Pin Assignment for the PS25451

## MECHANICAL DIMENSIONS

A preliminary package diagram is shown below. This is certain to change and so should only be used for illustration purposes.

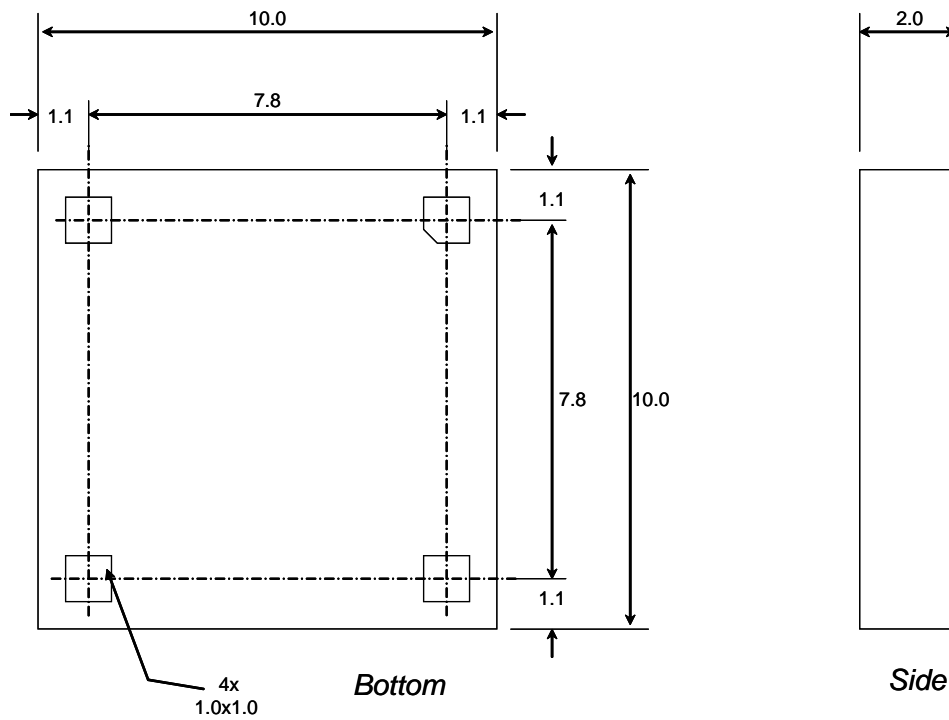


Fig. 5 Mechanical Drawing (all dimensions are nominal and in mm)

## ELECTROSTATIC DISCHARGE (ESD) PROTECTION

The PS25451 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

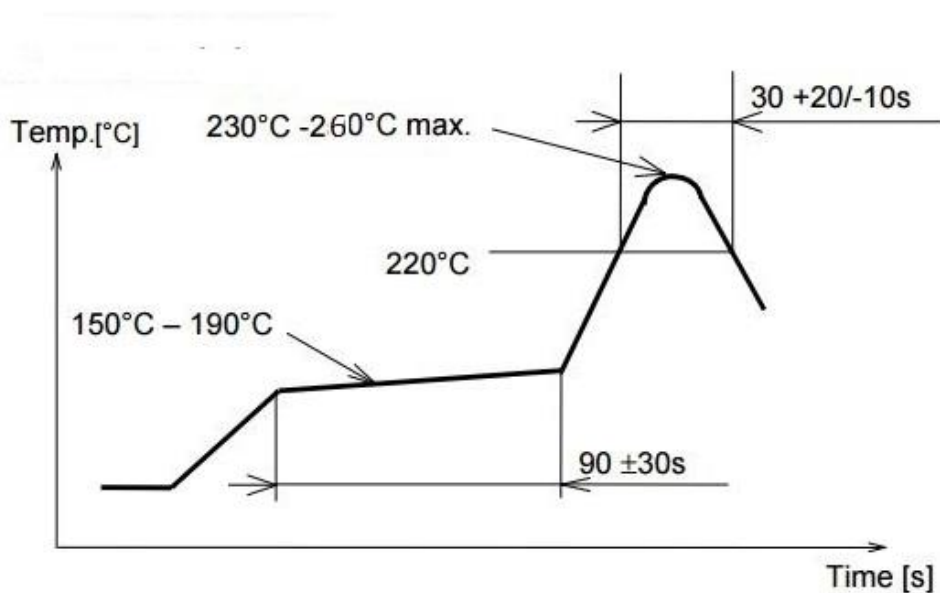
This component and many of the associated applications are covered by the following international patents:

|                      |               |
|----------------------|---------------|
| 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     |

## Soldering

Care should be taken during soldering as the device pads are delicate. A suitable low temperature re-flow paste should be used and the temperature profile shown below should be adhered to.

### FOR LEADFREE SOLDER



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