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 (Cin) and boost the input resistance (Rin). These techniques are used to realise a sensor with a frequency response suitable for remote sensing applications.

FEATURES
- Ultra high effective input resistance, typically 20GΩ.
- Effective input capacitance as low as 15pF.
- Upper 3dB point typically 20kHz.
- Operates with bipolar power supply from ±2.4V to ±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](image)

**ELECTRICAL CHARACTERISTICS**

\[ T_{\text{amb}} = -25^\circ C \text{ to } +75^\circ C, \text{Vdd/Vss } \pm 2.4V \text{ to } \pm 5.5V. \] 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.

<table>
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<tr>
<th>Characteristics</th>
<th>Value</th>
<th>Units</th>
<th>Conditions</th>
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<tr>
<td>Supply voltage</td>
<td>±2.4</td>
<td>±5.5</td>
<td>V</td>
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<tr>
<td>Supply current</td>
<td>1.5</td>
<td>2.5</td>
<td>3.5 mA</td>
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<tr>
<td>Effective input resistance</td>
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<td>GΩ</td>
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<tr>
<td>Effective input capacitance</td>
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<td></td>
<td>pF</td>
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<td>Voltage Gain (Av)</td>
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<td>Lower -3dB point</td>
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<td>Upper -3dB point</td>
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<tr>
<td>Noise</td>
<td>tbd</td>
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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.

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:
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