PS25251
EPIC Ultra High Impedance ECG Sensor
Advance Information

Data Sheet 291766 issue 3

FEATURES

- Ultra high input resistance, typically 20GΩ.
- Dry-contact capacitive coupling.
- Input capacitance as low as 15pF.
- Lower -3dB point typically 200mHz.
- Upper -3dB point typically 10kHz.
- 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

- Contact ECG signal detection for:
  - Non-critical patient monitoring equipment.
  - Emergency response diagnostics.
  - Lifestyle sports and health products.
  - Suitable for long-term and remote monitoring.

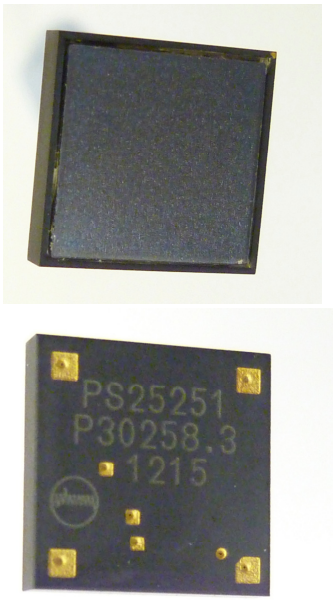

Fig. 1 PS25251 (top and bottom)

Ordering Information

PS25251
Custom package

-25°C to +75°C

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

The PS25251 is an ultra high impedance solid state ECG (electrocardiograph) sensor. It can be used as a dry contact ECG sensor without the need for potentially dangerous low impedance circuits across the heart. The resolution available is as good as or better than conventional wet electrodes.

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 both diagnostic and monitoring ECG applications.

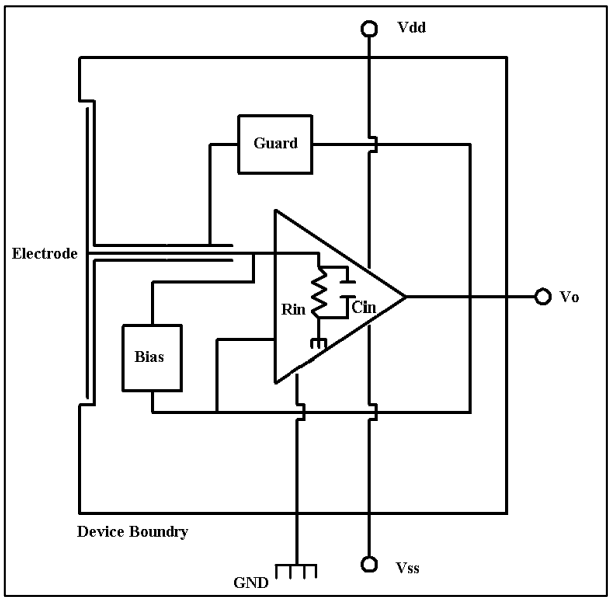

Fig. 2 Internal circuit of EPIC ECG Sensor

Plessey Semiconductors Ltd.
Design & Technology Centre, Delta 500, Delta Business Park, Great Western Way, Swindon, UK SN5 7XE
Tel: +44 1793 518000 Fax: +44 1793 518030 Web: www.plesseysemi.com

ELECTRICAL CHARACTERISTICS

T_{amb} = -25°C to +75°C, Vdd/Vss ±2.4V to ±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.

Characteristics	Value			Units	Conditions
	Min.	Typ.	Max.		
Supply voltage	±2.4		±5.5	V	Bipolar supply, Gnd=0V
Supply current	0.6	2.0	3.5	mA	
Effective input resistance		20		GΩ	
Effective input capacitance		15		pF	
Primary Output Voltage Gain (Av)	47.5	50	52.5		@1kHz
Coupling capacitance		250		pF	Sensor to skin
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	

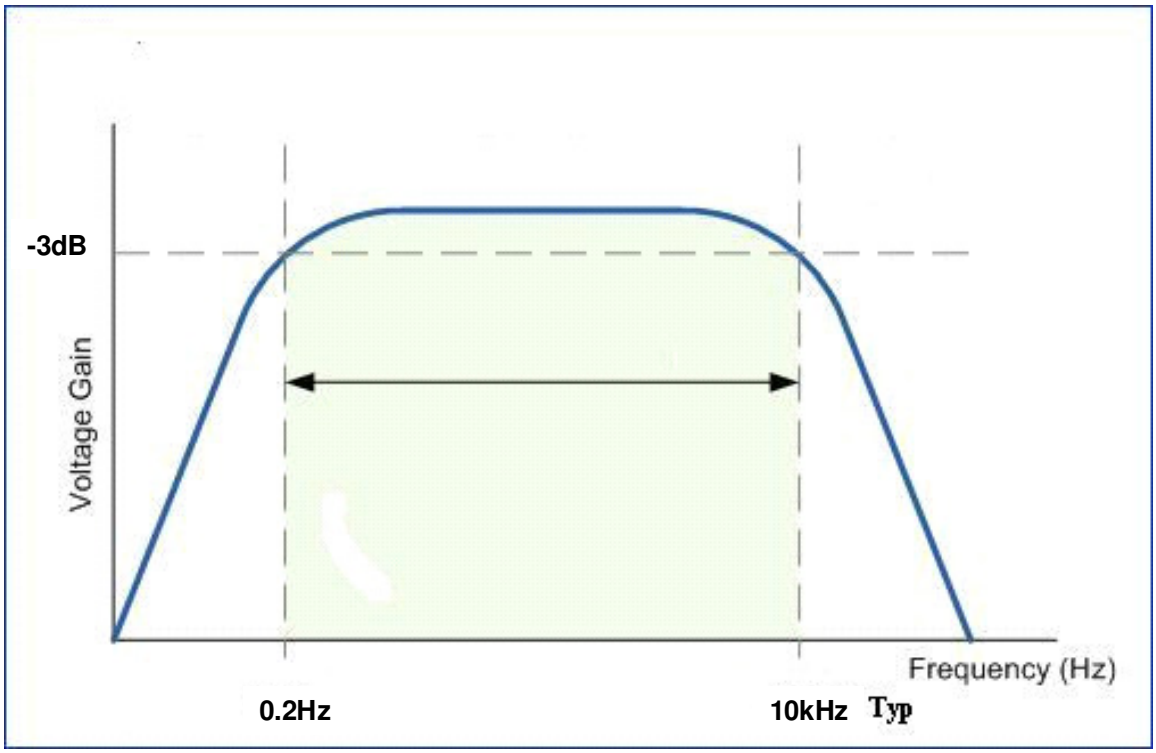

Fig. 3 Typical Bode Plot for EPIC ECG Sensor

Plessey Semiconductors Ltd.
Design & Technology Centre, Delta 500, Delta Business Park, Great Western Way, Swindon, UK SN5 7XE
Tel: +44 1793 518000 Fax: +44 1793 518030 Web: www.plesseysemi.com

PIN ASSIGNMENT

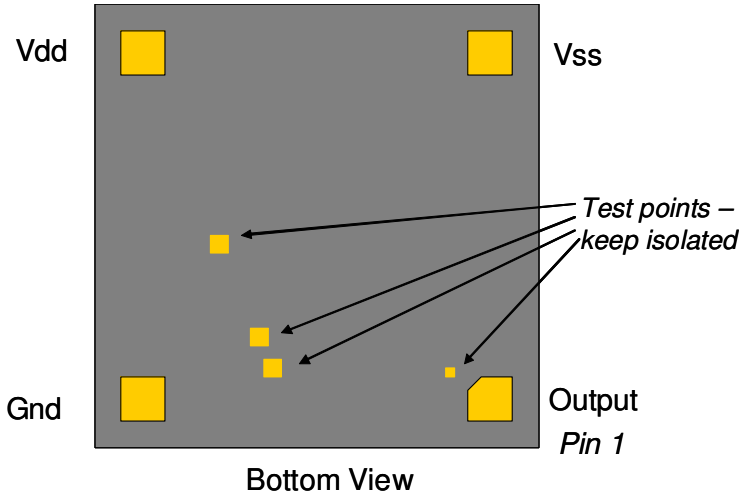

Fig. 4 Pin Assignment for the PS25251

MECHANICAL DIMENSIONS

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

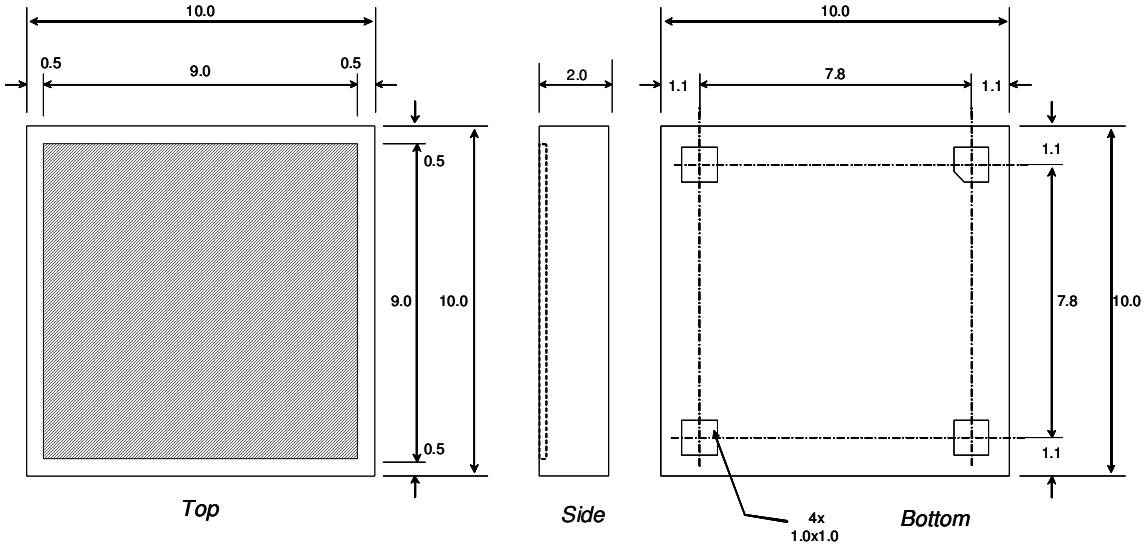

Fig. 5 Mechanical Drawing (all dimensions are nominal and in mm)

Plessey Semiconductors Ltd.
Design & Technology Centre, Delta 500, Delta Business Park, Great Western Way, Swindon, UK SN5 7XE
Tel: +44 1793 518000 Fax: +44 1793 518030 Web: www.plesseysemi.com

ELECTROSTATIC DISCHARGE (ESD) PROTECTION

The PS25251 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

Plessey Semiconductors Ltd.
Design & Technology Centre, Delta 500, Delta Business Park, Great Western Way, Swindon, UK SN5 7XE
Tel: +44 1793 518000 Fax: +44 1793 518030 Web: www.plesseysemi.com

APPLICATION OF THE ECG SENSOR

Because of the large coupling capacitance to the body (around 250pF) the EPIC sensor's internal electrometer can be used in differential mode to recover true surface potential ECG signals from the surface of the skin. A typical ECG signal at the surface of the skin is 1mV p-p.

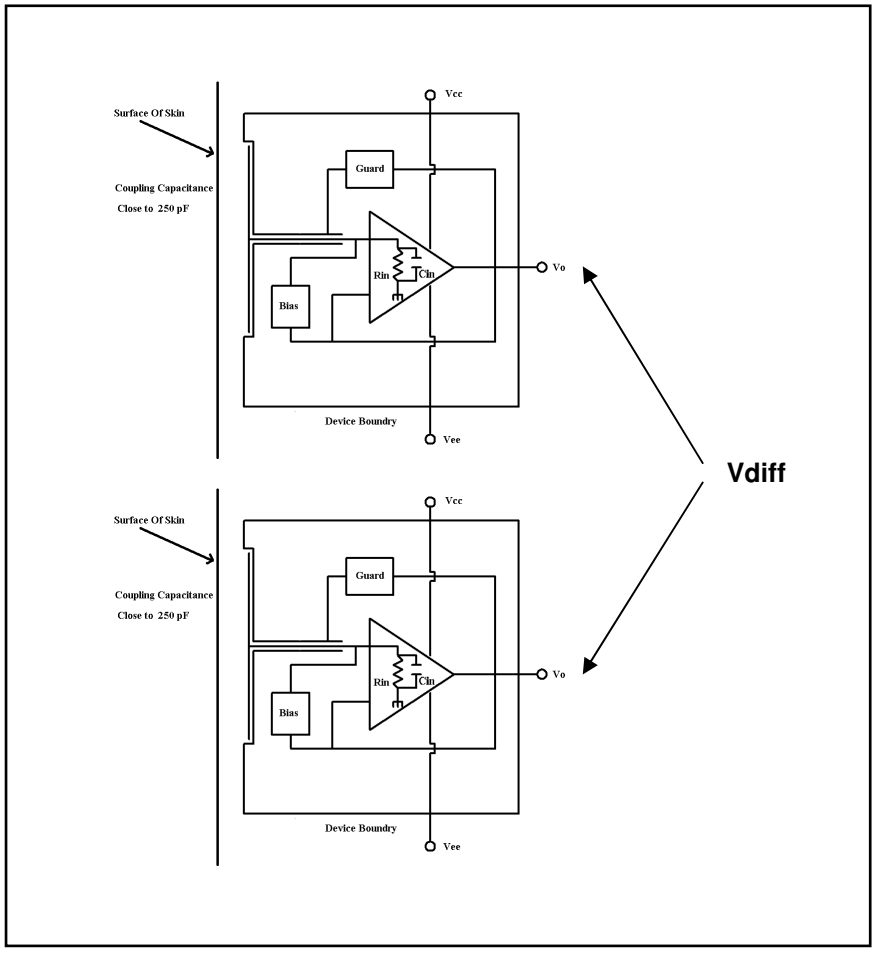

Fig. 7 Differential measurement of body (skin) surface potential to produce ECG trace

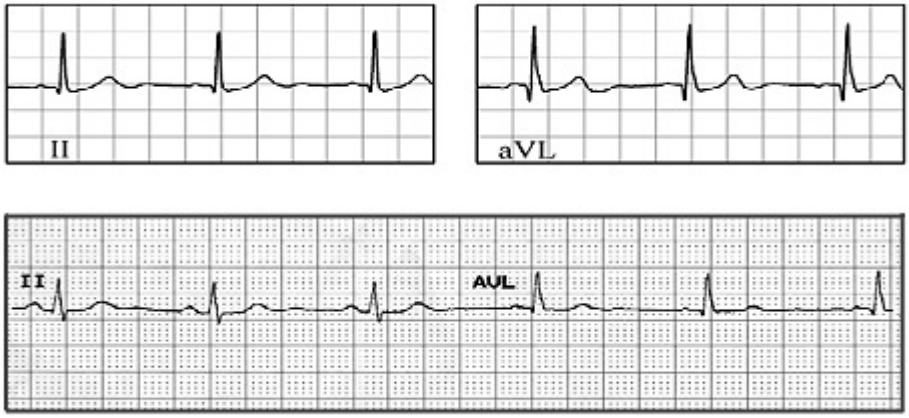

Fig. 8 Comparison of two vectors from a pair of EPIC sensors (top) and two conventional Ag/AgCl electrodes (bottom)

Plessey Semiconductors Ltd.
Design & Technology Centre, Delta 500, Delta Business Park, Great Western Way, Swindon, UK SN5 7XE
Tel: +44 1793 518000 Fax: +44 1793 518030 Web: www.plesseysemi.com

For further information about this and other products, please visit:
www.plesseysemiconductors.com

Data Sheet 291766 Issue 3

Plessey Semiconductors Ltd.
Design & Technology Centre, Delta 500, Delta Business Park, Great Western Way, Swindon, UK SN5 7XE
Tel: +44 1793 518000 Fax: +44 1793 518030 Web: www.plesseysemi.com

AMEYA360
Components Supply Platform

Authorized Distribution Brand :

Website :

Welcome to visit www.ameya360.com

Contact Us :

- ### Address :

  401 Building No.5, JiuGe Business Center, Lane 2301, Yishan Rd
  Minhang District, Shanghai , China

- ### Sales :

  Direct +86 (21) 6401-6692

  Email amall@ameya360.com

  QQ 800077892

  Skype ameyasales1 ameyasales2

- ### Customer Service :

  Email service@ameya360.com

- ### Partnership :

  Tel +86 (21) 64016692-8333

  Email mkt@ameya360.com