Electric Potential Technology Creates New Sensors

Plessey Semiconductors announced that it will be demonstrating its Electric Potential Integrated Circuit (EPIC) sensor technology at Sensors Expo (Chicago, USA June 6-8 2011). The EPIC sensor is a completely new area of sensor technology that measures changes in an electric field in a similar way to a magnetometer detecting changes in a magnetic field. The EPIC sensor, which requires no physical or resistive contact to make measurements, will enable innovative new products to be made such as medical scanners that are simply held close to a patient's chest to obtain a detailed ECG reading or devices that can 'see' through walls. The sensor can be integrated on a chip with other features such as data converters, digital signal processing and wireless communications capability.

Francois Pelletier, Plessey Semiconductors' Regional Sales Manager Americas, said, "EPIC technology is the most exciting addition to our expanding range of smart sensors. We already have demonstration kits which are available now for customers to evaluate the enormous possibilities of this innovative new field of sensor technology that is turning science fiction into actual products."

The technology works at normal room temperatures and functions as an ultra high, input impedance sensor that acts as a highly stable, extremely sensitive, contactless digital voltmeter to measure tiny changes in the electric field down to milliVolts. Most places on Earth have a vertical electric field of about 100 Volts per metre. The human body is mostly water and this interacts with the electric field. EPIC technology is so sensitive that it can detect these changes at a distance and even through a solid wall. Thus, for example, in a fire situation, it could be possible to determine if there any people in a smoke filled room before opening the door.

The first EPIC product, the PS25150, is an ultra high impedance, solid state ECG (electrocardiograph) sensor for applications such as non-critical patient monitoring, emergency response diagnostics, sports and health products and will be sampling in September 2011. It can be used as a dry contact ECG sensor without the need for potentially dangerous low impedance circuits across the heart. Key to this is that EPIC detects the voltage change in muscles and nerves without electrical contact so there is no need to have electrodes on or in the body to detect current changes. 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. The total voltage gain of the system is a function of both the input coupling capacitance (variable) and the internal sensor configuration.

Video demo at http://www.plesseysemiconductors.com/media_video.html [1]

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