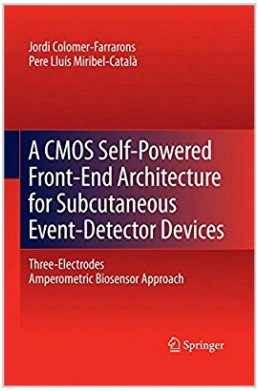

A CMOS Self-Powered Front-End Architecture for Subcutaneous Event-Detector Devices: Three-Electrodes Amperometric Biosensor Approach

By Jordi Colomer-Farrarons, Pere MIRIBEL

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A CMOS Self-Powered Front-End Architecture for Subcutaneous Event-Detector Devices presents the conception and prototype realization of a Self-Powered architecture for subcutaneous detector devices. The architecture is designed to work as a true/false (event detector) or threshold level alarm of some substances, ions, etc... that are detected through a three-electrodes amperometric BioSensor approach. The device is envisaged as a Low-Power subcutaneous implantable application powered by an inductive link, one emitter antenna at the external side of the skin and the receiver antenna under the skin.

The sensor is controlled with a Potentiostat circuit and then, a post-processing unit detects the desired levels and activates the transmission via a backscattering method by the inductive link. All the instrumentation, except the power module, is implemented in the so called BioChip. Following the idea of the powering link to harvest energy of the magnetic induced link at the implanted device, a Multi-Harvesting Power Chip (MHPC) has been also designed.

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Editorial Review

From the Back Cover

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Dr. Jordi Colomer-Farrarons received his BSc. degree in Electrical Engineering from EUSS (Salesians Technical Engineering School) in 2002. From 2002 to 2005 he worked as hardware design engineer at the automotive company Francisco Albero SA. In 2005, he received his MSc. degree in Electrical Engineering from University of Barcelona (UB). In 2010 he received his PhD degree from the UB. Since 2009, he works as fellow researcher at the BioEngineering and NanoBioEngineering-SIC-BIO Group of the UB, focusing on low-voltage low-power circuits, smart power, harvesting circuits, interface circuits for biomedical applications, and microelectronic design. From April to July 2009, he joined the Designs Service Department at IMEC's INVOMEC Divison (Belgium).

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