Integrating data converters for picoampere currents from electrochemical transducers - DTU Orbit (25/12/2018)

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This paper describes a current mode A/D converter designed for a maximum input current range of 5 nA and a resolution of the order of 1 pA. The converter is designed for a potentiostat for amperometric chemical sensors and provides a constant polarization voltage for the measuring electrode. A prototype chip using the dual slope conversion method has been fabricated in a 0.7 μm CMOS process. Experimental results from this converter are reported. Design problems and limitations of the converter are discussed and a new conversion technique providing a larger dynamic range and easy calibration is proposed.

General information
State: Published
Organisations: Department of Information Technology
Contributors: Breten, M., Lehmann, T., Bruun, E.
Pages: 709-712
Publication date: 2000

Host publication information
Title of host publication: The 2000 IEEE International Symposium on Circuits and Systems : Proceedings
Volume: 5
Place of publication: Geneva
Publisher: IEEE
ISBN (Print): 0-7803-5482-6

Electronic versions:
Madalina.pdf
DOIs: 10.1109/ISCAS.2000.857591

Bibliographical note
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Source: orbit
Source-ID: 175965
Research output: Research - peer-review » Article in proceedings – Annual report year: 2000