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# An Ultralow-Power High-Gain Biopotential Amplifier for Electromyogram Signal Recording.

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## Abstract:

This paper introduces a design for an ultralowpower electromyogram (EMG) signal amplifier with low noise operation. The design consists of two stages, the first stage is highly efficient but supply-sensitive single ended amplifier and the second stage is differential, to improve the supply rejection ratio and common mode rejection ratio. Each stage is configured with cascode MOSFET transistors to increase the gain value. The proposed design is simulated by 130 nm CMOS, and its results are reported. The design achieves 60.62 dB mid-band gain with bandwidth of 1.72kHz. Using a supply voltage of 1.1 V, the amplifier consumes 1.03  $\mu$ A of current. Input referred noise is 3.006  $\mu$ Vrms. The common mode and power supply rejection ratios are above 49.05 dB and 55.72 dB respectively.

## Keywords:

Electromyogram, EMG, power supply rejection ratio (PSRR), Common mode rejection ratio (CMRR), ultralow power, current-reuse complimentary input (CRCI).

## Published In:

Electronics, Communications and Computers (JAC-ECC), 2017 Japan-Africa Conference , NULL , NULL