

عنوان مقاله:

A Low-Noise Low-Power MOSFET only Electrocardiogram Amplifier

محل انتشار:

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خلاصه مقاله:

Electrocardiogram (ECG) signal is widely used in the diagnosis of heart diseases. Since the amplitude of this signal is very low, a high-gain low-noise amplifier with a high commonmode rejection ratio (CMRR) is needed. In portable applications a battery provides the required power for the ECG device. Hence, ECG amplifiers should have low area and power consumption. In this paper, an instrumentation amplifier for ECG application is proposed in which MOSCAPs are used to reduce the circuit area. MOSCAPs are inherently nonlinear and a technique is presented to reduce the impact of this nonlinearity. In ECG systems, a driven right-leg circuit is used to increase the CMRR of the amplifier. In this paper a class AB buffer is employed to implement this circuit. The simulation results show that the gain of the proposed amplifier is 46.18 dB and its input referred noise is $7.8\mu\text{Vrms}$ over the frequency range of 0.3 Hz to 150 Hz. The total power consumption of the designed amplifier is 72nW. The amplifier CMRR is 96 dB and its total harmonic distortion (THD) is 0.68% (at 60Hz)

کلمات کلیدی:

Electrocardiogram (ECG); instrumentation amplifier; driven right-leg circuit; CMRR; MOSCAP

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