

ANALYSIS AND DESIGN OF HIGH CMRR INSTRUMENTATION AMPLIFIER FOR ECG SIGNAL ACQUISITION SYSTEM USING 180nm CMOS TECHNOLOGY

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ABSTRACT

This paper describes the design of Current Mode Instrumentation Amplifier (CMIA) for ECG signal Acquisition system. The CMIA topology is based on voltage mode operational amplifier (op-amp) power supply current sensing technique. Op amp mismatch and precise current mirrors are two design challenges of this topology. High Common Mode Rejection Ratio (CMRR) and Power Supply Rejection Ratio PSRR instrumentation amplifier is developed for biomedical applications. The proposed circuit uses a current mode structure to solve the conventional circuit's problems. The Simulation of proposed design is done on virtuoso 6.1.5 using UMC 0.18 μ m CMOS technology. Thus design achieves a very high CMRR 126dB up to 700 Hz and higher than 100dB up to 10KHz and PSRR 123 dB up to 616 Hz and higher than 100dB upto 10KHz, 39.68 dB closed loop gain and input referred noise is only 214 nV/sqrtHz @150 Hz at 1.8V single power supply

KEYWORDS: Analog Integrated Circuits, Bio Signal Amplifier, CMRR, Low Noise, Low-Power Circuit Design, PSRR