

A Low-Voltage Single-Supply Analog Lock-in Amplifier for Wireless Embedded Applications

Miguel Gabal, Nicolás Medrano, Belén Calvo, Santiago Celma
Group of Electronic Design (I3A), University of Zaragoza, Spain

Abstract

This paper presents a low-voltage single supply analog lock-in amplifier designed for processing resistive sensor signals in embedded wireless applications. The circuit, based on a single phase approach, includes a differential instrumentation amplifier, an analog polarity-reversing switch mixer and a low-pass filter. Experimental measurements have confirmed the capability of the proposed 3-V supplied lock-in amplifier to effectively recover signals at a fixed frequency with signal to noise ratios below 0.05. In addition, the system can be operated in three different power modes that permit extending the battery operation lifetime of the system.