Continuous time circuits based on CDBA

A Dissertation submitted in the partial fulfillment for the award of

MASTER OF TECHNOLOGY
IN
VLSI AND EMBEDDED SYSTEM

Submitted By

Akanksha Rawat

Roll No: 2K11/VLS/03

Under the Esteemed Guidance of

Mrs. Rajeshwari Pandey

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

DELHI TECHNOLOGICAL UNIVERSITY

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CERTIFICATE

This is to certify that the project entitled, **"Continuous time circuits based on CDBA"** submitted by **AKANKSHA RAWAT, (2K11/VLS/03)**, in partial fulfillment of requirement for the degree of Masters of Technology in VLSI design and embedded system, is a bona fide work of the student mentioned above.

This project report is a record of the work carried out under my guidance and supervision and has not been submitted earlier in this University to the best of my knowledge.

Mrs. Rajeshwari Pandey
Associate professor
Electronics & Communication Engineering
Delhi Technological University

Prof. Rajeev Kapoor
Head of Department
Electronics & Communication Engineering
Delhi Technological University

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AKANKSHA RAWAT

M.TECH. (VLSI design and Embedded system)

Roll No. 2k11/vls/03

Department of Electronics & Communication Engineering

Delhi Technological University, Delhi-42

ABSTRACT

During the last few decades, designers have used voltage mode techniques to solve several circuit design problems. A traditional operational amplifier has a bandwidth which is dependent on the closed - loop voltage gain. To overcome this problem, circuits operating in current mode are preferred. Current-mode circuits are useful for the low voltage operation. In addition to the low voltage operation, popularity of current-mode circuits can be attributed to some other features such as larger dynamic range, low power consumption and higher speed. The popularity of current-mode circuits has resulted in emergence of various current mode analog building blocks. Current Differencing Buffered Amplifier (CDBA) is one of them. The CDBA being a current processing analog building block inherits the advantages of current mode technique. In addition, it is free from parasitic capacitances as its input terminals are internally grounded. Thus this active block is appropriate for high frequency operation. It provides further flexibility of design as both current and voltage outputs are available at high and low impedance respectively.

In this work a detailed description of CDBA along with its various implementations available in literature is presented which is followed by simulation of various signal processing and generation applications already existing in literature such as analog filters, floating inductor, multiplier, etc. Finally four circuit designs namely a PID controller, a monostable multivibrator, multi output filter and a grounded inductor using CDBA, are proposed in this work. The workability of the proposed circuits is verified through PSPICE simulation using 0.18µm CMOS process parameters.

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