CERTIFICATE

DELHI TECHNOLOGICAL UNIVERSITY
(Formerly Delhi College of Engineering)
BAWANA ROAD, DELHI – 110042
Department of Electronics & Communication Engineering

This is to certify that the report entitled **"OTRA BASED CONTINUOUS TIME CIRCUITS"** submitted by **Pawan Kumar**, **Roll.No.2k12/VLSI/14** in partial fulfilment for the award of degree of Master of Technology in VLSI Design & Embedded System at **Delhi Technological University, Delhi**, is a bonafide record of student's own work carried out by him under my supervision and guidance in the academic session 2012-14. The matter embodied in dissertation has not been submitted for the award of any other degree or certificate in this or any other university or institute.

Dr. Rajeshwari Pandey

ASSOCIATE PROFESSOR
Dept. of Electronics &Communication Engineering
Delhi Technological University
(Formerly Delhi College of Engineering)
Delhi – 110042

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Submitted by:

Pawan Kumar
2K12/VLSI/14
M. Tech. (VLSI Design & Embedded System)

ABSTRACT

The reduction of the minimum feature size of an MOS transistor for digital VLSI circuits has been ongoing for the past few decades. As the channel length is scaled down into deep sub micrometer dimensions, the lower power supply voltage is required to ensure the device reliability. To be compatible with digital VLSI technologies, analogue integrated circuits, which can operate at low supply voltages, are also receiving significant attention. This has resulted in development of various current mode analog building blocks and operational transresistance amplifiers (OTRA) is one among those. The OTRA is high gain current input voltage output device, both the input and output terminals are characterized by low impedance. OTRA being a current mode building block inherits the advantages of current mode processing, the input terminals are virtually grounded leading to circuits that are insensitive to stray capacitances. Being a current processing device the OTRA has a bandwidth independent of the device gain and is also not slew limited in the same manner as an OP-AMP.

Operational Transresistance Amplifiers are used in various type of applications namely filters, oscillators, multivibrators, multiplier and squarer etc. These all designs benefit from current mode approach of OTRA in this project a systematic review of the available literature on OTRA has been presented and are further studied and implemented. These OTRA based designs are best suited for the low power and high speed applications apart from its traditional field of application.

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ABBREVATIONS

CC1	First generation current conveyor
CCII	Second generation current conveyor
CDBA	Current differencing buffered amplifier
CFA	Current Feedback amplifier
CDTA	Current Difference Trans conductance Amplifier
LPF	Low Pass Filter
HPF	High Pass Filter
BPF	Band Pass Filter
BSF	Band Stop Filter
OTRA	Operational Trans Resistance Amplifier
MDCC	Modified differential current conveyor
CCII	Second Generation current conveyor
DCVC	Differential Current Voltage Conveyor
CDBA	Current Differencing Buffered Amplifier
CFOA	Current Feedback Operational Amplifier
CCCDTA	Current-controlled Current Differencing Transconductance
MOS-C	Mosfet- Capacitor
CO	Condition of oscillation
FO	Frequency of oscillation