

Accepted Manuscript

Regular paper

Capacitorless Digitally Programmable Fractional-Order Filters

Panagiotis Bertsias, Fabian Khateb, David Kubanek, Farooq A. Khanday, Costas Psychalinos

PII: S1434-8411(17)30173-5
DOI: <http://dx.doi.org/10.1016/j.aeue.2017.04.030>
Reference: AEUE 51864

To appear in: *International Journal of Electronics and Communications*

Received Date: 24 January 2017
Revised Date: 19 March 2017
Accepted Date: 18 April 2017

Please cite this article as: P. Bertsias, F. Khateb, D. Kubanek, F.A. Khanday, C. Psychalinos, Capacitorless Digitally Programmable Fractional-Order Filters, *International Journal of Electronics and Communications* (2017), doi: <http://dx.doi.org/10.1016/j.aeue.2017.04.030>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



Capacitorless Digitally Programmable Fractional-Order Filters

Panagiotis Bertisias¹, Fabian Khateb^{2,3}, David Kubanek⁴, Farooq A. Khanday⁵, and Costas Psychalinos¹

¹Electronics Laboratory, Physics Department, University of Patras,

Rio Patras, GR 26504, Greece, (e-mail: panosber@upatras.gr; cpsychal@physics.upatras.gr)

²Department of Microelectronics, Brno University of Technology, Technická 10, Brno, Czech Republic
(e-mail: khateb@feec.vutbr.cz)

³Faculty of Biomedical Engineering, Czech Technical University in Prague, nám. Sítná 3105, Kladno, Czech Republic

⁴Department of Telecommunications, Brno University of Technology, Technická 12, Brno, Czech Republic (e-mail: kubanek@feec.vutbr.cz)

⁵Department of Electronics and Instrumentation Technology, University of Kashmir, 190 006, Srinagar, India, (e-mail: farooqkhanday@kashmiruniversity.ac.in)

Abstract

Novel topologies of fractional-order filters, implemented using the internal gate-source capacitance of MOS transistors, are introduced in this paper. This has been achieved using current-mirrors as active elements, resulting into resistor realizations due to the employment of the small-signal transconductance parameter of the MOS transistor. This also offers the capability for electronic tuning of the frequency characteristics of the derived filter structures. The evaluation of the proposed technique has been performed through the design of a generalized fractional-order filter, which is also digitally programmed in such way that the four standard filter functions are offered. The behavior of the filter has been evaluated using the Cadence IC design suite and the Design Kit provided by the Austrian Micro Systems 0.35 μ m CMOS process.

Keywords: Fractional-order filters, Capacitorless filters, Active only filters, Generalized filters, CMOS analog integrated circuits.

Download English Version:

<https://daneshyari.com/en/article/4954005>

Download Persian Version:

<https://daneshyari.com/article/4954005>

[Daneshyari.com](https://daneshyari.com)