

Turkish Journal of Electrical Engineering & Computer Sciences

Turkish Journal

of

State-Space Synthesis of Current-Mode First-Order Log-Domain Filters

Electrical Engineering &
Computer Sciences

Ali KIRÇAY, Uğur ÇAM

Dokuz Eylül University, Faculty of Engineering, Department of Electrical and Electronics Engineering,
35160, İzmir-TURKEY

e-mail: ali.kircay@eee.deu.edu.tr , e-mail: ugur.cam@eee.deu.edu.tr



[Keywords](#)

[Authors](#)



elektrik@tubitak.gov.tr

Abstract: This paper proposes current-mode first-order log-domain filters, which are systematically derived using the state-space synthesis procedure. First-order low-pass, high-pass, and all-pass responses are obtained with different circuit types. The filter circuits have very simple structures, since they use only bipolar junction transistors (BJTs) and a grounded capacitor. They can be electronically tuned by changing an external current. The filters have a greater bandwidth due to inherently current-mode and log-domain operation. PSPICE simulations are given to confirm the theoretical analysis.

Key Words: Log-domain filters, current-mode circuits, state-space synthesis

Turk. J. Elec. Eng. & Comp. Sci., **14**, (2006), 399-416.

Full text: [pdf](#)

Other articles published in the same issue: [Turk. J. Elec. Eng. & Comp. Sci.,vol.14,iss.3.](#)

[Scientific Journals Home Page](#)