

# **VLSI BASED ACTIVE-GM-RC ANALOG FILTER FOR WIRELESS COMMUNICATION**

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## **ABSTRACT**

A VLSI based highly efficient active-Gm-RC analog filter used for various devices like UMTS and WLAN applications has been presented. The fourth order highly efficient analog filter is included in the receiver path of a reconfigurable terminal. The filter is designed by the cascade of two active-Gm-RC biquad blocks. A single op-amp is used for each biquad and its unity-gain-bandwidth is comparable to the filter cut-off frequency. Thus, the filter power consumption is strongly reduced w.r.t. other closed-loop filter configurations. In addition, the filter can be programmed in order to process UMTS and WLAN signals. A Fourth order low pass analog filter with 2 MHz cut-off frequency and a DC gain of 44 dB for UMTS receiver has been designed in 0.18 $\mu$ m CMOS technology with a  $\pm$ 0.8 V supply voltage. The filter has a power dissipation of 98  $\mu$ W for UMTS and 161  $\mu$ W for WLAN. The filter has input referred noise (spot noise) of 13.25 $\mu$ V at 2 MHz.

**KEYWORDS:** Analog Filters, CMOS, Low Voltage, UMTS, WLAN