CHAPTER 54

TECHNOLOGY
ELECTRONICS & COMMUNICATON ENGINEERING

Doctoral Theses

01. MAHENDRA (Mihika Mahesh)
Design, Analysis and Performances Enhancement of Various Analog Circuits.
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Abstract

In signal processing, demand for high performance low voltage analog integrated circuits with optimized power consumption is continuously increasing. It has influenced the analog designers to discover the various innovative techniques. These techniques must be capable to provide high performance analog circuits with reduced power consumption and should be suitable for he various portable and wireless applications. One of the most significantly used analog building blocks in various portable applications is the operational transconductance amplifier (OTA), which consumes more power. Therefore, the design of OTA necessitate careful optimization of trade-offs between speed, dynamic range, and power consumption. In proposed OTA-I and OTA-II, the dynamic threshold MOSFET (DTMOS) and an area- efficient adaptive biasing technique is used to obtain the enhanced slew rate with minimized power consumption. The OTA-I and OTA-II operate at ≠0.5 V dual supply voltage and provides average slew rate of 102 V/μs and 168 V/μs with 0.048 m W and 0.104 m W power consumption, respectively. The dc gain of OTA-I is obtained as 66.70 dB with 13.42 MHz GBW and dc gain of OTA-II is 73.86 dB with 15.36 MHz GBW, respectively. The proposed OTA-II is implemented using DTMOS based adaptive baising circuit and cross coupled positive feedback which provides enhanced slew rate and de gain.

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