

# **A CMOS TRANSCONDUCTOR WITH ENHANCED LINEARITY AND TUNABILITY IN 0.18 $\mu\text{m}$ TECHNOLOGY**

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## **ABSTRACT**

An enhanced configuration for a linearized MOS operational transconductance amplifier (OTA) is proposed. The proposed fully differential OTA circuit is based on feedback loops and passive components. It features high linearity, simplicity, and robustness against geometric and parametric mismatches. Detailed non-linearity analysis demonstrating the robustness of the proposed OTA is introduced. An efficient tuning technique using just a MOS transistor in the triode region allows the adjustment of the transconductance in a wide range. Simulation results of the transconductor designed in a 0.18  $\mu\text{m}$  CMOS technology with 1.8 V supply confirm the high linearity predicted. The measured IM3 with an input voltage of 0.35 V  $V_{pp}$  is below 100 dB for the entire bandwidth of 53 MHz, and the input referred noise density is 65 nV/sqrtHz.

**KEYWORDS:** CMOS OTA, Harmonic Distortion, Linearity