Design of CMOS Current-Controlled-Gamma Corrector

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Abstract

A high speed and low power CMOS current-mode current-controlled-gamma corrector composed of three approximating natural logarithm circuits and two approximating exponential circuits is proposed. By using companding design with only 17 transistors, we implement a low power and high speed current-controlled-gamma corrector. The gamma corrector was fabricated using a 0.35 u m CMOS technology. The measured bandwidth of the circuit could reach 120 MHz for an input range from 40 uA to 120 u A with a maximum power dissipation of only 1.18 mW.

Keyword：Gamma correction, Companding circuit, Current mode circuit, Square-root circuit, Cube-root circuit, Taylor series approximation