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SINGLE-ENDED FOUR-QUADRANT MULTIPLIER WITHOUT ANY PASSIVE COMPONENTS

L. RAMASAMY, J. H. NEVIN

Microelectronics Laboratory, Department of ECECS, University of Cincinnati, Ohio, USA

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ABSTRACT

A CMOS four-quadrant analog multiplier has been designed without any passive components to produce a highly linear single-ended output. A fundamental Gilbert-cell circuit is coupled with a CMOS adder circuit and an operational amplifier to produce a highly linear four-quadrant multiplier. The circuit achieves high speed operation and eliminates all passive components. The entire circuit is designed using only CMOS. A symmetrical design approach is used to provide a self balanced output with higher accuracy, low offset and high linearity.