

CMOS Positive and Negative Resistors Based on Complementary Regulated Cascode Topology with Cross-Coupled Regulated Transistors

Authors : Kittipong Tripetch, Nobuhiko Nakano

Abstract : Two types of floating active resistors based on a complementary regulated cascode topology with cross-coupled regulated transistors are presented in this paper. The first topology is a high swing complementary regulated cascode active resistor. The second topology is a complementary common gate with a regulated cross coupled transistor. The small-signal input resistances of the floating resistors are derived. Three graphs of the input current versus the input voltage for different aspect ratios are designed and plotted using the Cadence Spectre 0.18- μm Rohm Semiconductor process. The total harmonic distortion graphs are plotted for three different aspect ratios with different input-voltage amplitudes and different input frequencies. From the simulation results, it is observed that a resistance of approximately 8.52 M Ω ; can be obtained from supply voltage at ± 0.9 V.

Keywords : floating active resistor, complementary common gate, complementary regulated cascode, current mirror

Conference Title : ICMNP 2017 : International Conference on Microelectronics, Nanoelectronics and Photonics

Conference Location : Kyoto, Japan

Conference Dates : November 16-17, 2017